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Flattening the Traffic Curve: Infrastructure-Light Solutions

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FLATTENING THE TRAFFIC CURVE:

INFRASTRUCTURE-LIGHT SOLUTIONS



YIDAN CHEN & ESTHER HUANG | JUNE 2020

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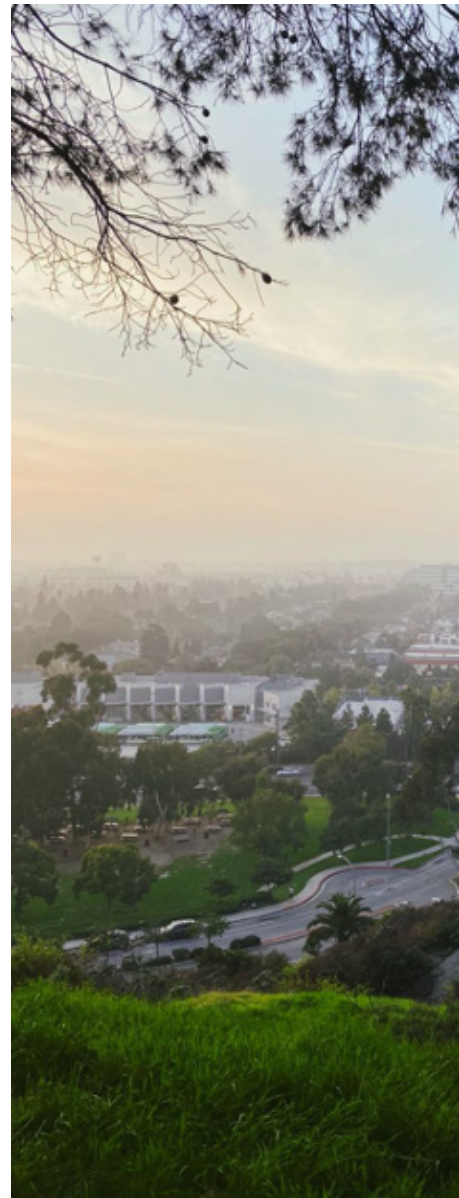
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Executive Summary

Culver City is anticipating a surge in economic growth in upcoming years, attributed to an influx of large employers. Its challenge will be in meeting growth objectives while managing increasing traffic congestion and emissions – a tall order on any given day, but especially so in light of the ongoing coronavirus pandemic. Culver City faces additional headwinds in counteracting potentially long-term, destructive changes to travel behavior, and operating under constrained city budgets during these times of austerity. This report focuses on three promising, cost-effective, and infrastructure-light strategies local officials can consider to advance their vision of a more walkable, bikeable, sustainable, and livable Culver City with improved circulation; they are: formation of a local transportation management association, transforming parking management, and consideration of various road pricing schemes. An analysis of local employment patterns, regulations, and traffic conditions informs our context-specific recommendations for their implementation in Culver City.

Transportation Management Associations (TMAs) are member-led community organizations that can help fill gaps in employee mobility and transportation services, particularly for small- to medium-sized employers. While Culver City is gearing up to welcome a spate of large employers with robust employee benefit programs, the City's employment profile remains overwhelmingly composed of small employers of under 50 people. A TMA might build off existing local business associations, introducing elements of transportation coordination and mobility services for these employer segments in order to promote mode choice conversions at the margins. While TMA impacts may be modest in comparison to pricing strategies, they impose lim-

ited cost and overhead burdens upon local agencies to operate and sustain.

Parking management is a different area where policies have largely languished. In Culver City, an extensive list of minimum parking requirements in the zoning code hampers redevelopment efforts, inflates housing costs, and results in a persistent oversupply of parking. An abundance of parking, most of which is also underpriced in Culver City, encourages and hardens a culture of automobile use. Reducing or eliminating minimum parking requirements and encouraging parking unbundling while also maintaining residential permit parking programs will gradually induce the types of mode

shifts sought after by local leaders and community members. Culver City would also benefit from increasing meter prices to achieve greater parity with regional rates, and from implementing a simplified performance pricing program to improve the parking experience while likely incremental revenues in the process.

In addition to adequate pricing of parking, Culver City stands to be a national leader in moving to adopt a local **road pricing** scheme. While road pricing has consistently proven to be one of the most effective ways of reducing congestion, it sorely lacks a strong, vocal constituency at all levels of government. Southern California's freeways are the

strongest candidates for congestion charges, but require local communities to step up to facilitate and push for regional coordination of such efforts. Culver City could push the envelope by seeding the public dialogue, starting at the local level. Absent a comprehensive freeway charging system, Culver City might pursue an unprecedented effort to control congestion within its local jurisdiction by formulating a targeted corridor pricing scheme. Corridor pricing allows Culver City to target congested arterials with greater precision than other approaches, such as cordon pricing. In any application of a congestion charge, local revenues could ostensibly be diverted to local initiatives to further mobility, sustainability, and livability.

Key Recommendations

01 Formation of a Transportation Management Association (TMA)

A lightweight strategy; "low-hanging fruit"

02 Progressive Parking Policies, including Performance Pricing for Parking

An essential solution for a long-distorted, car-oriented urban landscape

03 Consideration of Various Congestion Pricing Schemes

A once radical strategy, now becoming more popular and relevant

Introduction



A thriving regional job center, Culver City currently generates substantial travel flows to and from the Greater Los Angeles region. Within just the next five years, the city is expected to usher in over 7,000 new jobs in the technology sector alone. This is an extension of longer-term growth trends which saw jobs in Culver City increase by over 25 percent over a 10 year period to reach a total of 59,528 jobs in 2017.¹ These changes have shined a spotlight on the City as an emerging tech and media hub, adjacent to other employment hubs in Santa Monica, Venice, and Playa Vista. **Culver City's challenge lies in promoting growth objectives while keeping a rein on accompanying congestion and emissions.**

“The real challenge is to separate, as best as we can, the costs of congestion from the benefits of a vibrant metropolitan area.”

Michael Manville

Professor of Urban Planning
UCLA Luskin School of Public Affairs

To address some of these challenges, Culver City's Planning Department plans to introduce a transportation demand management (TDM) ordinance, providing a menu of land use requirements and mitigation strategies to be applied to new development projects. Culver City currently applies such measures to projects on an ad-hoc basis. Some examples include the B-TAP Card and parking cash-out programs outlined in the comprehensive plan for The Culver Studios,² or the bicycle share and bicycle parking facilities noted in the Conditions of Approval for Apple's new space at 8777 Washington Boulevard.³ Based on our conversations with City officials, we understand that the Planning Department is already crafting a comprehensive TDM ordinance to formalize the menu of land use requirements and mitigation strategies to be applied to new development projects; therefore we have omitted these strategies from our analysis.

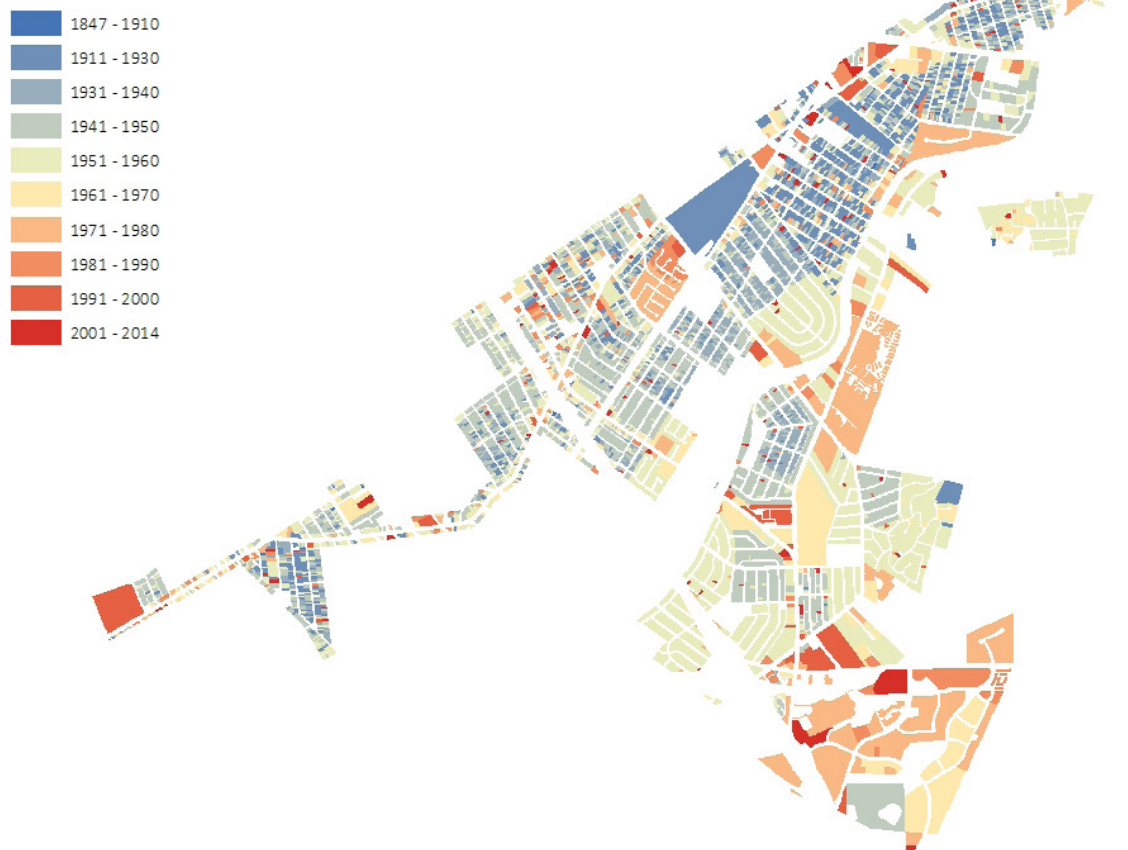
1 Southern California Association of Governments. (2019). Profile of the City of Culver City.

2 City of Culver City. (2017, November 30). The Culver Studios CPA No. 7.

3 City of Culver City. (2017, May 10). Resolution No. 2017-P009.

Notably, Culver City was intensively developed during the 1950s and 1970s, and newer, transit-friendly development projects comprise a trivial portion of the overall building stock (Map 1). Unfortunately, this also means that **policies directed at new development will have limited impacts on congestion and automobile use**, given that likely less than 0.1 percent of stock in Culver City will be subject to new mitigation strategies within the foreseeable future. Because Culver City is already relatively built-out, new development patterns--and therefore uptake of TDM strategies from the new ordinance--will progress rather slowly.

Map 1. Culver City Urban Development Pattern



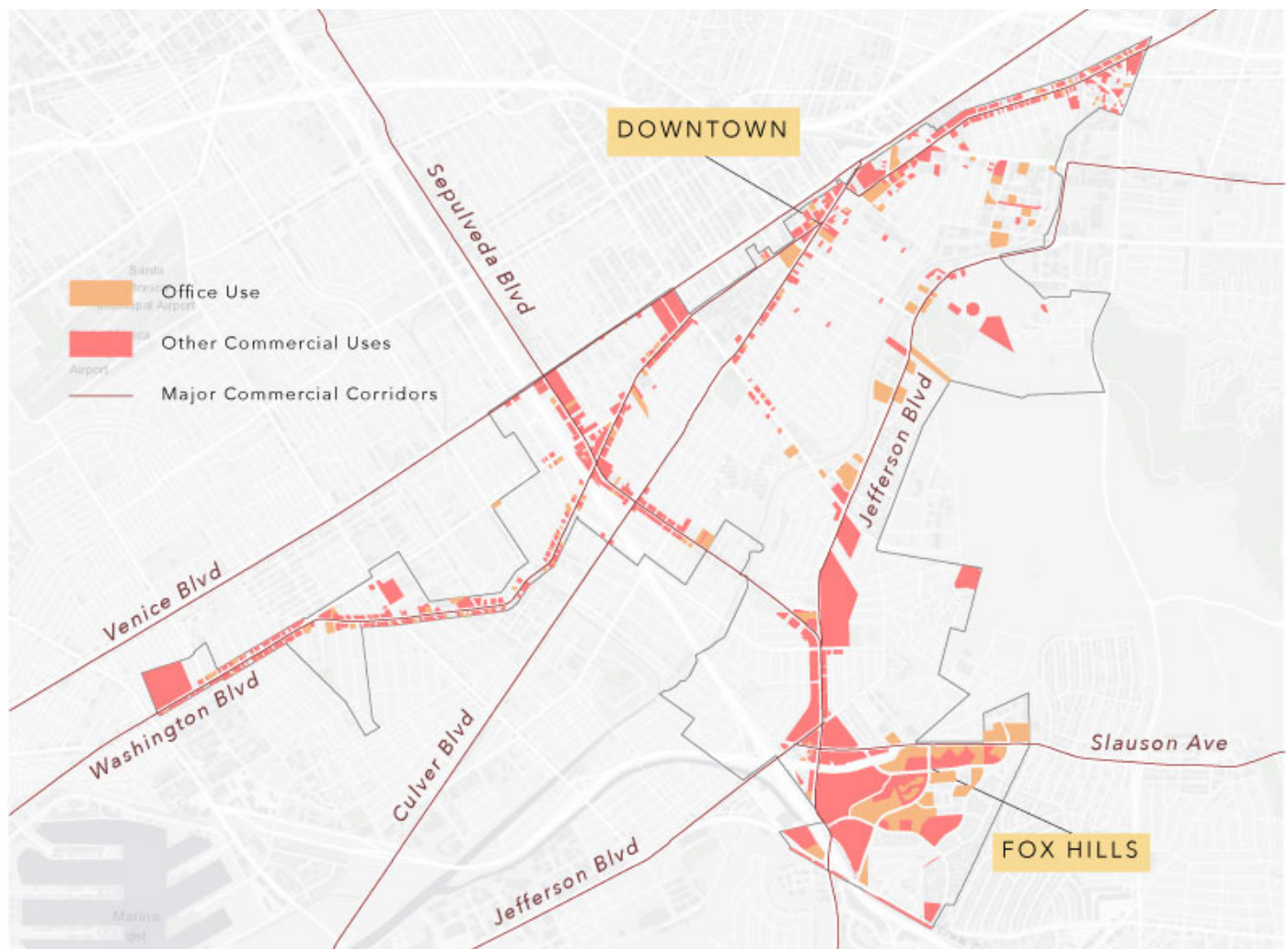
“TDM strategies targeting new development are impeded by age of the building stock in Culver City.”

Prior to even the spate of recent announcements of incoming large employers in Culver City, public officials and residents of Culver City have been outspoken about deteriorating traffic conditions and increasing emissions, voicing their concerns over through-traffic, congestion, and sustainability during city council meetings, at speaker nights, and in workshops such as those conducted during the TOD Visioning Study. In 2017, Culver City saw over 72,000 daily work trips, a number approaching twice its residential population, and an increase of approximately 25 percent over the previous ten years.⁴

New job growth will put additional strain on the City’s legacy street network, and reliance on conventional, capital-heavy infrastructure investments to alleviate congestion may not always produce the desired results. The distribution of land use in Culver City concentrates commute flows downtown and in

⁴ LEHD Origin-Destination Employment Statistics. (2017) U.S. Census Bureau. Washington, D.C., Longitudinal-Employer Household Dynamics Program, accessed at <https://onthemap.ces.census.gov>

Map 2. Commercial Parcel in Culver City



the southern tip of the city. While these areas are served by the Expo Line and the Culver City Transit Terminal, transit projects are unlikely to reduce overall congestion levels (as any improvement in traffic conditions will invite more drivers back onto the road), they should be regarded positively as ways of increasing person throughput and transit accessibility within Culver City.⁵

Expensive capital projects are also increasingly out of reach for public agencies nationwide, given incredible pressures on city budgets and heightened uncertainty in light of a global pandemic.⁶ Facing extreme budget shortfalls due to reduced sales and income tax revenues and growing pension obligations, cities are left with few choices but to

put capital-intensive projects on hold and to turn their attention towards maintaining bare minimum critical operations - meaning that many traditional methods of addressing congestion, including traffic calming projects and supply-side interventions such as road construction and heavy transit infrastructure, are out of the question, at least in the near-term or absent new sources of revenue.

The evolving coronavirus situation suggests that its far-reaching impacts on our communities are yet to be fully realized. The strides Culver City has made in enhancing mobility and livability within the city risk being wiped away by even marginal mode choice conversions and automobile purchase decisions favoring single-occupancy vehicle travel

⁵ Giuliano, G., Chakrabarti, S., & Rhoads, M. (2016). Using regional archived multimodal transportation system data for policy analysis: A case study of the la metro expo line. *Journal of Planning Education and Research*, 36(2), 195–209.

⁶ Lazo, A., & Harrison, D. (2020, May 7). Coronavirus brings California mass unemployment, huge budget hole, governor says. *Wall Street Journal*.



- a potential effect of heightened concerns over disease transmissibility in public spaces and mass transit. While telecommuting may experience a rise in popularity, any improvements to circulation as a result may be offset by even a tiny fraction of the population electing to purchase a vehicle and being locked into that mode choice for a decade or more. Culver City and many other municipalities find themselves in a tough position, being forced to act nimbly and run extremely lean while remaining true to original mobility goals, and while working to thwart potentially devastating, lasting travel behavioral changes.

To this end, this report focuses on three **promising and cost-effective strategies** that local agencies in Culver City should evaluate to help reduce congestion and encourage sustainable mode shifts: formation of an employer-led transportation management association, redesigned parking management, and consideration of various road pricing schemes. Employer associations are designed to be lightweight initiatives carried out in association with local businesses, large and small, to roll out incentive programs and reduce single-occupancy vehicle travel during peak periods. A renewed approach to parking management will enable Culver City to maximize turnover, utility, and revenue productivity of its curb space and parking facilities. Lastly, these unprecedented conditions may prove to be an opportune time to give greater weight to novel approaches of pricing the public utilities that are our roads using congestion pricing theories.

GOALS



The analyses contained in this report are guided by Culver City's objective to improve circulation and enable alternative modes of transportation, as outlined in its 5-Year Strategic Plan set in 2018.⁷ We recognize City Council's aim of introducing high-impact reforms to alter travel behavior and establish Culver City as a vibrant model for mobility and livability, and have proposed ambitious reforms accordingly.

The primary goal of this report is to devise recommendations in support of this vision of mobility and sustainability in Culver City, with an eye to its longer-term growth targets as well as its current budgetary constraints. We are careful to refrain from unduly decrying congestion in all its forms - if the shelter-in-place restrictions during the coronavirus crisis were any indication, an acute decline in traffic and congestion can have truly disastrous consequences for local economies, despite the im-

provements to pedestrian safety⁸ and air quality.⁹ Recognizing that growth in traffic is not inherently an evil phenomenon (and is in fact often associated with economic growth¹⁰, job accessibility, and a region's overall vitality¹¹) our research is motivated to evaluate appropriate tradeoffs and to locate a healthy balance between growing traffic levels and economic expansion in Culver City.

To best support Culver City's impending General Plan update efforts, the proposed strategies are flexible to allow for integration into short-, medium-, or long-term mobility initiatives, and help to mitigate the negative impacts of economic development on the quality of life in Culver City over the next 30 years. Our approach and recommendations are mindful of Culver City's unique economic, physical, cultural, and historical contexts, keeping with the city's professed vision of a connected community, enhanced mobility, and greater quality of life.

7 City Council of the City of Culver City Strategic Plan. (2018, October 22). Retrieved from <https://www.culvercity.org/home/showdocument?id=15912>

8 Shilling, F., & Waetjen, D. (2020). Special Report (Update): Impact of COVID19 Mitigation on Numbers and Costs of California Traffic Crashes. UC Davis Road Ecology Center. Retrieved from https://roadecology.ucdavis.edu/files/content/projects/COVID_CHIPs_Impacts.pdf

9 Barboza, T. (2020, April 28). L.A. coronavirus clean air streak has already come to an end. Here's why. Los Angeles Times. Retrieved from <https://www.latimes.com/environment/story/2020-04-28/coronavirus-la-air-quality-improved-pandemic-dont-expect-it-to-last>

10 Sweet, M. (2014). Traffic Congestion's Economic Impacts: Evidence from US Metropolitan Regions. *Urban Studies*, 51(10), 2088–2110.

11 Taylor, B. (2015). Rethinking Traffic Congestion. *Access Magazine*, 8-16.

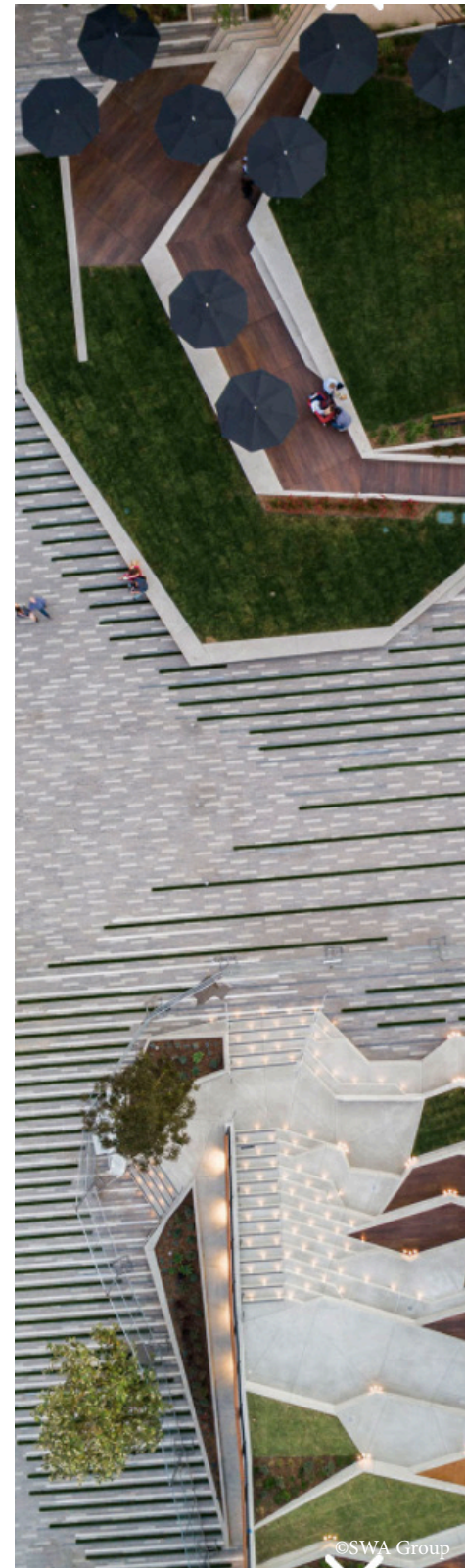
APPROACH

This report builds upon the Transit-Oriented Development Visioning Study completed by the city in 2017. That six-month effort sought to promote the viability of a wider set of mobility options for residents and other users. Following a series of public workshops with community groups and City staff, the consultant team produced a set of broad suggestions, ranging from microtransit and bicycle networks, to establishing a “complete streets” design. One recommendation in particular urged the city to enact transportation demand management measures to curb automobile reliance and promote alternative modes. **Our study expands on this insight from the Visioning Study to investigate the selection and implementation of specific travel demand management strategies.**

In contrast to infrastructural solutions, TDM is focused on the drivers of behavioral decisions around transportation, and encourages more efficient use of existing institutions and infrastructure, with the goal of minimizing capital investments often associated with supply-side interventions such as new transit or road infrastructure. **TDM** espouses a cost-effective approach to transportation system design to naturally **promote demand for alternative modes over single-occupancy vehicle travel.**¹²

Dozens of separate TDM measures have been proposed and popularized over the years, in numerous communities, in different contexts, and to varying degrees of success. Culver City’s goal of eschewing the automobile in favor of alternative modes is instructive in weighing the merits and demerits of various strategies to manage travel demand. Our analysis began with a brainstorming session to establish an initial list of eleven TDM strategies which align with Culver City’s stated goal of managing circulation. We prioritized strategies focused directly on curbing automobile usage, and deprioritized those which sought to manage congestion in more indirect ways (e.g., exacting impact fees from development).

We then proceeded to evaluate these strategies within a framework which considers **efficacy, cost, and feasibility** in the context of Culver City. This approach produces a shortlist of three strategies we have determined would most benefit the City. Our report presents the case for each strategy in detail and notes current conditions in Culver City relevant to their consideration. Each broad strategy can be broken down into a number of supporting sub-strategies, which we dissect as well as propose paths for implementation. Case studies highlighting instances of each strategy in-play demonstrate impact and serve to illustrate their potential applicability to Culver City. We conclude our report with a brief discussion of organizational “keys to success” for successful adoption of the proposed TDM strategies.



¹² What is TDM? (2020, February 5). Retrieved from <https://mobilitylab.org/about-us/what-is-tdm/>



Types of TDM Programs

TDM programs are often directed at restricting automobile usage, increasing vehicle occupancy, shifting travel mode, or reducing the need for travel. Carefully designed systems of incentives or disincentives can be effective at substantially changing the cost or convenience of driving alone, driving during certain times, between travel modes, or trip-making in general.

In evaluating different approaches to managing travel demand, it is worth considering political context and the different regulatory mechanisms at play. Over-reliance on the automobile can be viewed as learned behavior stemming from decades of discordant or myopic regulatory models that have encouraged specific uses of public-of-ways. To change these behaviors, and make people and organizations do things they would not otherwise do, requires novel mechanisms of enforcement to accomplish.

Broadly speaking, TDM measures can be bucketed into two main types of enforcement approaches: deterrence and persuasion.¹³

Deterrence-based approaches are helpful in clarifying for individuals the actual cost of automobile travel. Most people pay only a fraction of the costs associated with driving, namely – insurance, fuel, and (sometimes) parking. Even with parking, the vast majority of spaces in the U.S. are left unpriced. Charging for use of public roads and parking spaces, to be more commensurate with their externalities of congestion, emissions, and crashes, works to deter automobile travel as individuals perform an adjusted calculus to arrive at their decision to drive or not. Enacting pricing mechanisms for deterrence is, in effect, makes plain the costs that were once obscured or distorted by free and unlimited use of the public right-of-way.

Persuasion-based approaches are based on a more optimistic assumption that individuals and organizations drive due to non-strategic motives, perhaps from ignorance or a lack of proper resources to mitigate their automobile usage. Persuasion often encourages harm reduction at the margins rather than wide-scale reordering of driving behaviors as with deterrence techniques. TDM strategies relying on persuasion employ information, advice, and additional public resources as the critical tools, rather than the imposition of direct costs on drivers.

¹³ Lodge, M., & Wegrich, K. (2012). *Managing Regulation*. Red Globe Press.

To the far end of the spectrum actually lies another category, reserved for strategies to reduce driving that are couched in **compulsion**; however, these often take the form of land-use, development, streetscape design, and other infrastructural interventions, and fall outside the realm of traditional TDM strategies, which are far less capital-intensive. For the purposes of this report we have chosen to focus on the most cost-effective, persuasion- or deterrence-based TDM measures, highlighted in the table below.

Table 1. Preliminary TDM Measures List

Deterrence	Mileage-based user fees	Per-mile fees levied on individual drivers using specialized mileage-metering equipment; enables such services as “pay-as-you-drive” auto insurance
	Parking pricing and management	Includes parking unbundling, performance pricing, reduction or elimination of parking minimums
	Congestion pricing	Variable pricing used to reduce congestion on heavy traffic corridors or within congested areas.
Persuasion	Employer trip reduction programs	Includes alternative work arrangements/flex time, commuter transit & rideshare benefits, travel subsidies
	Multimodal navigation tools	Maps, web/smartphone apps, trip planners, wayfinding resources, and other multi-modal navigation tools
	On-site transit info and pass sales	Transit information and transit pass sales provided on-site at employers and institutions
	Ridesharing	Public agency- or employer-led programs encouraging carpooling and vanpooling
	Transit promotion and pricing	Marketing, education, travel pass partnership programs, and targeted fare discounts to promote transit modes
	Transportation Management Association	Member-controlled organizations that provide transportation coordination & services in an area

Greyed-out strategies were screened-out; see rationale below.

The preliminary list was further screened using a combination of three main criteria:

Impact

Does this strategy result in meaningful impacts to the primary goals of improving circulation and encouraging mode shifts?

Cost/Benefit

Does this strategy require significant ongoing effort or overhead on the part of the city? Will this strategy realize recurring public revenues or expenditures?

Feasibility

Is there community or political appetite to pursue this strategy? Can Culver City sufficiently direct or influence its implementation?



Screening Deterrence-based Approaches

While there has been some discussion of moving to replace fuel taxes with mileage-based fees as a revenue stream and to mitigate congestion and emissions, there remain significant hurdles to implementation due to cost, administrative challenges, and user acceptance.¹⁴ Fees charged to drivers on a per-mileage basis helps to expose consumption habits (driving) that are currently perfunctory in nature. However, mileage-based fees are ideally implemented at the state and federal levels to realize meaningful reductions in congestion (as, at any given time, most motorists driving in Culver City do not live in the City), as well as any potential benefits in the form of value-added services (namely, pay-as-you-drive insurance, as well as safety alerts, real-time traffic information, and routing assistance).

Although pursuit of mileage-based fees is less feasible at the local level, and best led by state and federal powers, practically-speaking, we encourage Culver City to raise these issues at all levels of governance in order to advance the public dialogue.

Road pricing and parking pricing, both deterrence-based strategies, have consistently demonstrated success in reducing congestion and emissions. Indeed, adequate pricing may be the primary solution; for this reason, we have chosen to elaborate upon these two strategies in the context of Culver City in our research.

¹⁴ Ecola, L., Sorensen, P., Wachs, M., Donath, M., Munnich, L., Serian, B. (2011). Moving Toward Vehicle Miles of Travel Fees to Replace Fuel Taxes. RAND Research Brief. Retrieved from https://www.rand.org/pubs/research_briefs/RB9576.html

Screening Persuasive-based Approaches

TDM strategies that adopt a persuasive approach currently lack strong, conclusive evidence of reliable efficacy. To be sure, some studies have suggested vehicle trip reductions on the order of 3-15 percent realizable from such strategies as promotion of alternative modes, alternative commute services, and financial incentives.¹⁵ However, these results can not be applied universally. The impacts of these types of persuasive TDM strategies are mitigated by the strength of parking management policies and the viability of alternate modes within the broader region - both major constraining factors within the broader context of auto-dependent Los Angeles County.

While our recommendation to Culver City to initiate an employer transit management association (TMA) falls under this category of persuasion-based strategies, the proposed TMA model places the onus on participating members to sustain the organization. When implemented alone, one study suggested that TMAs may reduce 6% of commute trips.¹⁶ While such impacts are hardly transformative, the City might decide that a TMA is a worthwhile pursuit given minimal startup costs and handoff of operations to membership of a voluntary, employer-driven TMA (more details provided in our Level 1 section).

Providing Culver City residents and commuters with educational materials, tools, apps, reward programs, and transit discounts can be helpful for generating goodwill and awareness within the community, and may produce marginal gains to mobility, though at the City's expense in terms of continuous staffing, overhead, and programming efforts.

Ultimately, **persuasive strategies are just that - mere suggestions of change**. Even though expenses may be relatively slight for persuasion-based tactics, it is unlikely these types of interventions will achieve the desired levels of transformation Culver City officials and residents seek. During these times of austerity, public agencies must evaluate programs and tradeoffs using outcome-oriented frameworks. Investing small sums in incremental change may be the most painless solution; however the urgency posed by the current climate crisis and ongoing pandemic risks suggests that now is the time to put all our chips on proven--if more complex--strategies to overhaul travel behavior over the next three decades.

Final Shortlist

Our screening process ultimately produced three different TDM strategies we deemed to be suitable for Culver City:

- Formation of a Transportation Management Association (TMA)
- Progressive Parking Policies, including Performance Pricing for Parking
- Consideration of Various Congestion Pricing Schemes

The following sections include in-depth analyses of the selected strategies, with levels indicating their relative magnitude of impact, and a discussion of their applicability to Culver City given current conditions.

¹⁵ Cambridge Systematics. (2010). Increasing the Integration of TDM into the Land Use and Development Process, prepared for Fairfax County Department of Transportation.

¹⁶ Transportation Management Associations. (n.d.). Retrieved from <http://www.vtppi.org/tdm/tdm44.htm>



01

Formation of a Transportation Management Association (TMA)

A lightweight strategy; "low-hanging fruit"

Key Recommendations

- Introduce a TMA pilot program targeting smaller employers
- Support the creation of a TMA by providing initial seed funding
- Help identify and secure initial TMA grants

Benefits:

- Flexible/Experimental
can test and evaluate effectiveness of various TDM strategies in the local context
- Low Cost
TMA's are non-profit organizations that rely on grants, fees-for-service, developer contributions, and donations
- Highly feasible
builds upon existing local business associations

Risks:

- Identifying community members to take ownership
- Obtaining sources of external funding

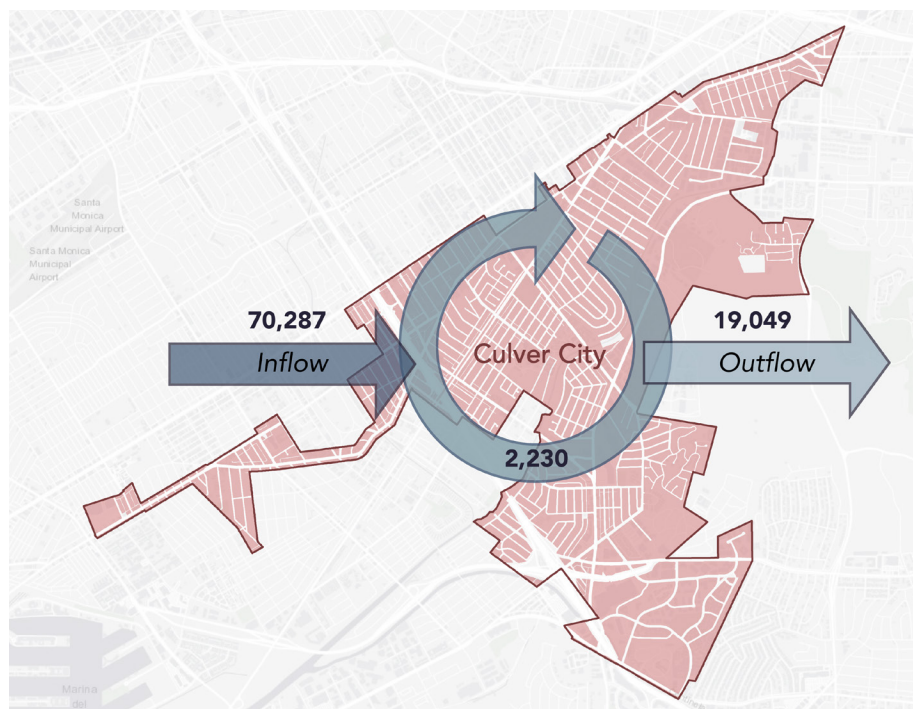
Consideration:

- Maximize volunteerism & buy-in

A Transportation Management Association (TMA) brings together a consortium of local businesses to coordinate transportation services and advocate for commute trip reductions. TMAs fall under a broader umbrella of employer-based TDM strategies, which work by mobilizing private business to minimize single-occupancy vehicle commute trips.

Inefficient commute trips contribute significantly towards congestion in Culver City. Despite the City's central location, most employees travel over 10 miles to work here, and the percentage of super-commuters (those who travel 50 miles or more to work) is increasing.¹⁷ The job inflow/outflow map shows that job inflows were three times more than outflows, and that inflow accounted for approximately 97 percent of the total workforce in Culver City. In 2017, only about 44 percent of total commuters lived in census blocks within 10 miles of city boundaries, meaning that a majority commute from far away. Similarly-sized cities in the region, such as Santa Monica, Beverly Hills, and West Hollywood, have lower proportions of commuters arriving from far away. Culver City also has a higher percentage of super-commuters (15 percent of total workers) than neighboring cities (11 percent for West Hollywood and 12 percent for Santa Monica).¹⁸

Map 3. Culver City Job inflow/Outflow (2017)



Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2017).

To be sure, the regional connectivity afforded by its location creates traffic headaches for Culver City, but also opens it to greater economic opportunity as well as increased viability of alternate modes for short commute distances.

Culver City's largest employers, including tech giants Amazon and Apple, **already have well-established teams and sophisticated internal processes dedicated to employee commute support and administration of trip reduction initiatives.** Most firms realize that lengthy travel times and single-occupancy vehicle commuting have adverse impacts on employee health, productivity, and ultimately, their financial bottom-line. Given their size, they have the means to provide a wide array of employer transportation

The vast majority (77 percent) of Culver City residents drive alone to work. This number is substantially higher than the proportion in Santa Monica (68 percent) and the City of Los Angeles (70 percent). The disparity in mode choice is even more dramatic when considering Culver City residents work closer to home than residents of nearby cities. 64 percent of Culver City residents work within a 10-mile buffer, whereas only 54 percent of those in Santa Monica do. One possible explanation is that, geographically speaking, Santa Monica is located along the edge of the greater region, resulting in people commuting over a longer distance, whereas Culver City and West Hollywood are more centrally-located, within greater proximity to other major employment centers in the region.

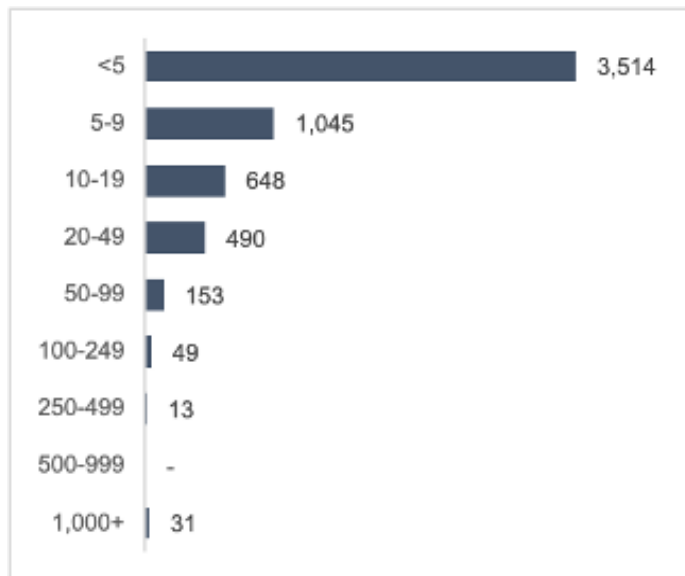
¹⁷ LEHD Origin-Destination Employment Statistics. (2017). U.S. Census Bureau. Washington, D.C., Longitudinal-Employer Household Dynamics Program. Retrieved from <https://onthemap.ces.census.gov>

¹⁸ Ibid.

benefits, including carpooling programs,¹⁹ employee shuttles, and subsidized transit passes.²⁰ It is **imperative that Culver City work with Transportation Coordinators at these large firms to share information** about transit connectivity and mobility initiatives, as well as align on such initiatives as private shuttles and buses, which can help keep single-occupancy vehicles off the road (and which happen to be privately-subsidized).

In addition to extensive programming and benefits made available by large employers, California’s South Coast Air Quality Management District (SCAQMD), charged with regulating air pollution in Southern California, administers regulations directed at reducing emissions produced by employee commutes. SCAQMD’s Rule 2202, adopted in 1995, requires that employers above 250 employees provide employees with a menu of TDM options, including incentives to carpool or utilize transit, or else pay mitigation fees.²¹

Fig. 1: Count of Business Establishments by Number of Employees, 2017 (source: US Census Bureau)



Despite the availability of employer-based TDM initiatives in the region, current offerings miss a

crucial segment of the employee base. Culver City’s top ten employers each employ over 500 people, and while together they account for over 10,000 employees, they make up just over 40 percent of the total workforce in the City.²² **The vast majority of employers in Culver City are considered small businesses**, which employ fewer than 100 people. We estimate that over 80 percent of businesses establishments in the city fall into this category, with over half employing less than six people. These **smaller employers often lack the knowledge, experience, and resources** that larger employers have at their disposal **in adopting trip reduction strategies within the workplace.**

A Culver City TMA may help to bridge the gap for employees of small businesses in the area by providing an institutional framework to administer trip reduction services. TMAs, which pool together resources across multiple small employers are more cost-effective than individually-administered programs, and can achieve levels of support comparable to the offerings of larger employers. Studies have suggested that TMAs may contribute to a 6 percent reduction in commute trips.²³ A coordinated planning function can be effective in helping local businesses with such initiatives as:

- rideshare matching and vanpool coordination
- remote work programs
- assistance with transit tax benefits
- flexible work schedules coordination
- shared parking coordination
- bulk reduced-rate transit passes
- event traffic services and support
- government advocacy for transportation initiatives

These persuasion-based TDM strategies are better implemented at-scale, and with mechanisms for support and accountability via an organization such as a TMA. By providing information and

19 Amazon Employee Benefit: Commuter Checks & Assistance. (2018, June 30). Retrieved from https://glassdoor.com/Benefits/Amazon-Commuter-Checks-and-Assistance-US-BNFT35_E6036_N1.htm

20 Apple Employee Benefit: Commuter Checks & Assistance. (2020, March 08). Retrieved from https://glassdoor.com/Benefits/Apple-Commuter-Checks-and-Assistance-US-BNFT35_E1138_N1.htm

21 SCAQMD. (n.d.). Rule 2202 Forms, Rule, Guidelines, & Fees. Retrieved from <http://www.aqmd.gov/home/programs/business/r2202-forms-guidelines>

22 Comprehensive Annual Financial Report (Rep.). (2018, January 29). Retrieved from <https://www.culvercity.org/Home/ShowDocument?id=12541>

23 Transportation Management Associations. (n.d.). Retrieved from <http://www.vtapi.org/tdm/tdm44.htm>



support for alternative commute modes, TMAs encourage employees to shed the daily auto commute and instead investigate the viability of different modes.

While they may not elicit the most radical changes to travel behavior, neither are TMAs an immense drain on city budgets and resources. Local government is in a position to lead the charge by creating a TMA and providing initial seed funding, while leaving continuing operations to leadership and membership of the association. Annual operational budgets for TMAs vary by scale and the types of services offered, but have been found to range from \$150,000 to \$200,000,²⁴ much of which is sourced from membership fees (typically \$10 to \$20 annually for each covered employee²⁵). As nonprofit organizations, most TMAs also receive significant amounts of funding from state and federal sources, such as the Federal Highway Administration’s Congestion Mitigation and Air Quality Improvement (CMAQ) Program. Remaining amounts are generally covered by fees-for-service, developer contributions, and donations.

A TMA pilot program would be a lightweight and flexible solution enabling Culver City to test and evaluate employee acceptance and the effectiveness of various TDM strategies. As outlined in Culver City’s most recent Strategy Planning document, the City has declared its intention to better-engage the community and cultivate public-private partnerships. Culver City officials can draw upon the success of such initiatives as the Culver City Safe Routes to School Program, which has evolved from the singular effort of passionate community member Jim Shanahan, to

24 Hendricks, S.J., Results of the 2003 TMA Survey. (2004). Transportation Research Record: Journal of the Transportation Research Board, No. 1864, 129–134. TRB, National Research Council

25 Ferguson, E. (2007). Transportation Management Associations: A Reappraisal, Journal of Public Transportation 10(4), 1-26, Center for Urban Transportation Research



an integral aspect of the mobility initiatives supported by the City.²⁶ Similarly, a local TMA would be initiated by first identifying local business leaders willing to lead this effort, starting with outreach to Culver City's Downtown Business Association and Washington West Business District, for which a TMA may serve as natural extensions. We recognize that Culver City community members and small businesses are highly engaged, motivated, and receptive to innovative mobility policies, and we encourage local government to involve these members and draw upon this enthusiasm to work towards achieving sustainable mode shifts. The Culver City Transportation Department and Planning Commission can help to identify sources of funding, as well as provide guidance in structuring the TMA, in establishing a business plan, and with initial operations.

Businesses may benefit not only from potentially improved circulation and air quality, but also **TDM should be framed as a good business practice that brings together businesses with shared values**, and which benefits participants by solving site access problems, assisting with employee recruitment or retention, and providing additional employee benefits - these features serve to further maximize volunteerism for a TMA initiative. Based on the experience of an initial pilot program, additional employers and local organizations should be recruited to participate in the TMA. Continued, demonstrated

interest and commitment of involved organizations would steadily reduce overhead, relieving the City of day-to-day responsibilities of operating this TDM program, as well as generate valuable buy-in from community members.

Beyond helping to strategize and coordinate transportation services, **a TMA has the added function of serving as an organizing function for local small businesses**, often to advocate local and state government for beneficial transportation initiatives. However, in special circumstances such as the one we find ourselves in currently, a TMA, as an extension of local business associations, can serve as an additional resource for businesses reeling from the impacts of coronavirus and potentially seeking community support or partners to aid in the recovery efforts. **A TMA can help to facilitate dialogue between business owners, community members, and public officials, and serve as a conduit for information around safe transportation services, best reopening practices, employee and customer safeguards, and effective communication practices.** For example, a business collective might be helpful for coordinating staggered reopening efforts of complementary business types, while maintaining safe social distancing guidelines. Whether during this particular crisis or inevitable future ones, there are long-term benefits to bringing together local businesses to engage with one another, and with local officials, under the umbrella of a Culver City TMA.

26 Holland, E. (2019, October 1). Culver City Students Join International Walk To School Day. Patch. Retrieved <https://patch.com/california/culvercity/culver-city-students-join-international-walk-school-day>

	Palo Alto ¹	Seattle ²	Houston ³
Context	Palo Alto launched a TMA in 2015 in an effort to address rising congestion and to reduce SOV commuting rates to downtown.	Seattle's TMA, launched in 2004, is a collaborative effort between Downtown Seattle Association, King County Metro, Sound Transit, and the City of Seattle to promote alternatives to SOV commuting.	Houston's TMA is an initiative borne out of its Downtown Management District in order to promote environmental sustainability and reduce car dependency.
TMA Description	The most popular feature of Palo Alto's TMA program are transit subsidies, as well as discounted rideshare programs. Participating businesses include hotels, restaurants, and retailers of varying sizes.	The TMA offers programming, toolkits, resources, and transit benefits consulting services to all downtown employers. Specialized transit pass programs are targeted directly at small business with under 100 employees. The program is funded largely by private businesses, and supported by local transportation agencies.	Houston Downtown Management District works with Central Houston, Inc. to provide TMA services and education to downtown employers and employees. The program offers educational resources, a mobility app, as well as carpool and transit incentive programs for local employers.
Results*	The percentage of downtown workers using alternative transit went up from 18% in 2015 to 27% in 2018, while the drive-alone rate fell from 57% to 49%. In 2018, the TMA obtained 501(c)3 non-profit status and secured over \$240,000 in private funding for organizational development.	Seattle's TMA conducts an annual mode split survey. 2019 results indicate that nearly half of downtown employees commuted via transit. SOV commuting rates have fallen by 10% since 2010 while the number of jobs has increased by 45% over the same period.	Houston's 2018 commute survey revealed that 32% of downtown employees use public transit to get to work, compared to 2.4% transit use across the broader Houston region.
Commentary	In its earlier years the TMA effort was largely funded by the City's parking revenues. The TMA later began to source funding from foundations and private contributions from larger employers in the area.	During the Covid-19 crisis, the TMA has mobilized to offer telework guidance and transit information to local employers.	Houston's downtown TMA shows that commute reduction initiatives can be applied within a broader context of entirely car-oriented landscapes.

* Important to note that it is difficult to attribute results directly to TMA initiatives; improvements to congestion and transit modeshare are likely impacted by a variety of factors.

1 Sheyner, G. (2019, January 18). Fueled by early success, Palo Alto TMA eyes expansion. Retrieved May, 2020, from <https://www.paloaltoonline.com/news/2019/01/18/fueled-by-early-success-palo-alto-tma-eyes-expansion>

2 Downtown Seattle Transportation. (n.d.). Retrieved May, 2020, from <https://commuteseattle.com/>

3 Transportation. (n.d.). Retrieved May, 2020, from <https://www.downtownhouston.org/resource/transportation/>



02

Parking Management

An essential solution for a long-distorted, car-oriented urban landscape

Key Recommendations

- Eliminate minimum parking requirements, or at the very least, repeal in designated Transit Priority Areas and reduced in all others
- Require parking unbundling for new development, including residential
- Require employers of all sizes to offer employees the option of unbundled parking
- Raise meter rates and adopt performance-based pricing for city-owned parking assets
- Eliminate fee exemptions for parking placards

Benefits:

- Significant Impacts
improve allocation and use of existing resources and ultimately disincentivize driving in urban areas
- Low Cost
City must conduct studies and parking surveys to inform updates to parking ordinances and relevant policies.
- Generates Revenue
optimize pricing and existing meter infrastructure

Risk:

- Neighborhood/community opposition to reduction of parking availability, perceived or real

Consideration:

- Revenue recycling

Through his comprehensive research over the years, UCLA Professor Donald Shoup has laid bare all that is awry with the state of parking policies in the United States: **abundant, low-priced parking reinforces a pattern of continued automobile dependency**; cities provide an oversupply of parking, yet often fail to properly price—and therefore allocate—these valuable assets, leading to a vicious cycle of surplus parking, greater sprawl, housing unaffordability, and increased automobile traffic. This system of concentrated costs yet dispersed benefits serves to benefit motorists at the expense of all others, encouraging automobile usage and its associated negative externalities, including wasted time, congestion, pollution, and energy consumption.

No doubt Culver City City Council Members are well-aware of Shoup's research and writings on the topic, having often cited Shoupisms in their evaluation of parking strategies for the City. To be sure, Culver City is not immune to the problems that plague the rest of the country. Much of its issues with regard to livability can ultimately be traced to parking mismanagement; for this, the solutions lie in straightforward fixes prescribed by Dr. Shoup: (1) reduce the number of parking spaces, and (2) charge higher prices for those that remain, thereby inducing people to drive less.

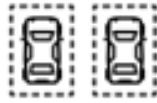
Parking Requirements

In practical policy terms, a reduction in parking can be achieved via the softening (or better yet, repeal) of parking requirements. Parking requirements, a common feature in most city zoning codes, stipulate a minimum number of parking spaces tied to specific commercial and residential land uses. There is good reason Shoup refers to parking requirements as “professionally-induced disasters” wrought by urban planners. Rarely are these requirements based upon any rigorous, site-specific analyses; often they rely upon rough averages from national surveys, or follow precedents set by other cities. In some instances, planners fall back on arbitrary formulas, such as “The Golden Rule” (four spaces per 1,000 square feet). Additionally, “nobody ever got fired for [going by ITE]” – that is, the Institute of Transportation Engineers’ (ITEs’) Parking General Reports, which are problematic for establishing parking requirements due to issues of false precision and systematic upward bias in their parking recommendations.²⁷ These factors compound, leading planners to persistently overprescribe the supply of free parking.

²⁷ Shoup, D. C. (2011). *The High Cost of Free Parking*. Chicago: Planner's Press.



Amongst Culver City's own lengthy list of parking minimums include such requirements as:



spaces per single-family unit



(guest) parking space for every 4 residential units in multi-family dwellings



x 8 *spaces at a minimum at convenience stores*



x 10 *spaces at a minimum at car wash facilities*



space per 100 square feet, plus 1 space for every 30 square feet of dance floor for bars and nightclubs

Requiring developers to shoulder the costs of parking directly subsidizes individuals who choose to travel by automobile despite its high terminal costs. In order to reconcile the zoning code with a vision of a more walkable, bikeable, sustainable, and livable Culver City, we recommend that **parking requirements be eliminated, or alternatively, repealed in the City's designated Transit Priority Areas and reduced in all others.** Parking minimums fail to align with Culver City's planning values, economic development goals, and climate action plan. Removing these arbitrary parking requirements stimulates redevelopment activity (due to greater ease of construction), enables denser forms of development,²⁸ and encourages the use of more sustainable, alternative modes, such as car sharing and public transit.²⁹

While there has been some discussion surrounding the viability of **parking maximums** in Culver City, the truth of the matter is that, **in the absence of a floor on parking, their impacts on Culver City would be limited** due to high car ownership rates and the present car-oriented nature of the broader region. Any serious consideration of parking maxi-

mums in Culver City should come secondary to the reevaluation of its generous parking minimums. Maximums would more likely factor into larger commercial development projects where developers seek to include copious amounts of parking, but for which a process already exists to exact Conditions of Approval and transportation mitigation strategies. **Achieving the right level of maximums is just as complex of an exercise as setting the right minimums:** too low, and developers will push back against inane regulation; too high, and they are rendered useless.

Current conditions in Culver City cannot be compared to, say, those in New York City, where parking maximums are five times less than the parking minimums required in Los Angeles' densest neighborhoods.³⁰ In a city where land is scarce and valuable, parking requirements significantly increase the cost of redevelopment, making a full out "parking arms race"³¹ dubious in the context of Culver City. Developers already recognize that they have to provide some level of parking in order to sufficiently attract buyers or residents in an auto-centric region, yet must balance those interests

28 Manville, M., & Shoup, D.C. (2010). Parking requirements as a barrier to housing development: regulation and reform in Los Angeles. UC Berkeley: University of California Transportation Center. Retrieved from <https://escholarship.org/uc/item/1qr84990>

29 Forinash, C.V., Millard-Ball, A., Dougherty, C., & Tumlin, J. (2003). Smart Growth Alternatives to Minimum Parking Requirements

30 Manville, M., Beata, A., & Shoup, D. (2013) Turning Housing Into Driving: Parking Requirements and Density in Los Angeles and New York, *Housing Policy Debate*, 23:2, 350-375

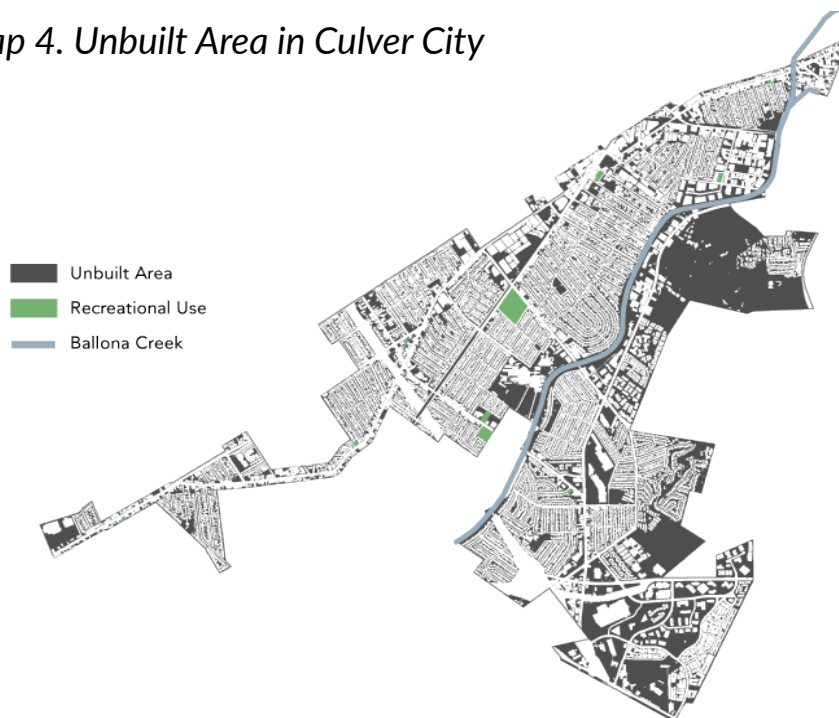
31 Ibid.

against their bottom line in weighing whether to build out costly parking structures rather than supplying additional housing or commercial units. The high-priced, competitive real estate market in Culver City already disincentivizes the building of parking far in excess of minimum requirements, diminishing the utility of parking maximums. In contemplating the appropriate supply of parking, **the calculus is best left to market forces dictating the capital costs of development.**

Additionally, while minimum requirements may trigger public investments via “in lieu fees” assessed on a per-project basis, it is our understanding that Culver City currently derives scant revenues from these payments, instead redirecting businesses to fulfill parking requirements via long-term (five-to-ten-year) leases at public parking facilities.³² Even with broad reductions in parking minimums in Culver City, as economic growth contributes to fuller parking facilities, local officials can lean on pricing--increasing rates at facilities, or adjusting in-lieu fees--as the primary lever by which to manage travel demand.

A rollback of parking minimums rightly raises concerns over **parking spillover** into residential neighborhoods. However, this issue is remedied by the issuance of residential parking permits to assure local residents of spaces to store their vehicles. Culver City has already made some strides in this area, having approved regulations for residential parking policies and fees in 2013.³³ Reducing or removing minimum parking requirements from the zoning code would be a significant step towards more efficient land management when carried out in lockstep with **actively managed preferential parking districts and other targeted curb management policies to eliminate street spillover.** While they may be tough political pills to swallow, only can such broad-based deterrence strategies evoke the mode shifts and behavioral changes required of our times. In enacting such policies, Culver City would be following in the bold footsteps of other cities, including Portland, Minneapolis, and San Francisco, in reducing parking supply to aggressively tackle the twin issues of congestion and emissions.

Map 4. Unbuilt Area in Culver City



32 Alternative Parking Provisions, CCMC § 17.320.025

33 City of Culver City. (2019, November 18). Resolution No. 2013-R

Unbundled Parking

Yet another approach for disentangling the hidden costs of parking from other products and services is by unbundling. **Unbundling parking entails separating the cost of individual parking spaces from occupancy of a commercial or residential building**, allowing employees or residents to use spaces according to their own needs. Unbundling parking is one of the most effective approaches to managing travel demand, with studies of it demonstrating up to 22 percent reduction in single-occupancy vehicle commuting.³⁴

The State of California currently requires all employers of 50 or more people who lease parking spaces provide the employees the option of “cashing out” their parking spaces in exchange for monetary or other incentives. Studies revealed that this mandatory cash out policy reduced the number of daily vehicle work trips by 11 percent and reduced commuter parking demand by 13 percent.³⁵ However, **the current state legislation has critical holes, namely the exclusion of residential buildings, smaller employers, and employers who own their own parking lots.**

New residential development is a viable target for unbundling policies; by distinguishing the high costs of parking from the cost of housing, unbundling helps to boost housing affordability. Executed in conjunction with the reduction or elimina-

tion of parking minimums, unbundling residential parking can further suppress automobile reliance as well as stimulate housing development by reducing capital requirements tied to expensive parking construction. Consequently, a reduction in residential parking can encourage more people to use transit and alternative travel modes.

Culver City is also in a position to **expand upon existing legislation by requiring employers of all types and sizes, including those who own parking spaces, to provide unbundled parking to employees.** Culver City’s abundance of small businesses implies that the current California law does not extend to many local employers, but this does not mean they cannot be similarly incentivized to reduce their usage of parking. Provided that employers in the latter category are provided sufficient support and advance outreach, they would be able to convert any existing owned spaces into market-rate parking to collect revenues, potentially freeing up more parking for visitors and patrons. In areas rich with transit connections and bicycle or pedestrian infrastructure (as Culver City has worked towards achieving), unbundling policies and reductions in parking requirements work in tandem to enable residents and employees to save money by forgoing parking, introducing a self-reinforcing cycle of vehicle travel reductions in favor of alternative modes.



34 Shoup, D. C. (2005). Parking Cash Out. Chicago, IL: APA Planning Advisory Service.
35 Ibid.



Performance-based Pricing

The second of Shoup’s two-pronged solution for parking management addresses the longstanding issue of **underpriced parking assets**. By charging appropriate prices, buyers (in this case, motorists) can be efficiently matched to available supply (parking spaces) while avoiding a glut of inventory (empty spaces).³⁶ While Culver City sets its on-street meter rates to be just higher relative to the rates charged at public parking structures and other off-street parking locations, on-street parking should be regarded as a premium commodity which serves as the market price setter influencing the adjustment of off-street rates, as opposed to the other way around. On-street parking is a valuable asset for cities; however, **Culver City’s current meter rates remain low** when compared to neighboring municipalities. Table 2 below shows ranges for Santa Monica and Los Angeles. The median rate in those cities is \$2 and \$3 dollars, whereas in Culver City it is \$1.

Table 2. Hourly Parking Rate Comparison

Culver City	Santa Monica	Los Angeles
\$0.25 - \$1.50	\$1.25 - \$1.50	\$0.50 - \$6.00

As evidenced by surrounding areas, Culver City has significant leeway to allow meter rates to float above their current levels, and to expand the range of pricing levels. \$1.50 is the highest price, set at a fixed rate for all of Downtown. However, this rate is just barely higher than the lowest rate in Santa Monica, and is well below maximum variable rates found in Downtown Los Angeles. While \$0.25 is the rate for 10-hour meters for employee parking, this low hourly rate is insufficient to cover even credit card and meter vendor processing fees, resulting in a minimum purchase of two hours. **Our recommendation is to raise this rate floor for long-term meters to \$0.50 to approach employee parking rates found in nearby Santa Monica, and to allow all other rates to rise, up to a ceiling of \$5.00 per hour.**

A corollary to pricing parking better is eliminating fee exemptions for parking placards. A 2012 study carried out by Michael Manville and Jonathan Williams revealed that “disabled placards accounted for half of meter nonpayment and 40 percent of meter hours” in Los Angeles, translating into massive rev-

36 Manville, M., 2014. Parking Pricing. In Parking: Issues and Policies. Edited by Stephen Ison and Corinne Mulley.



© Jamie Grill

enue loss for the city. Additionally, placard abuse runs rampant – a study conducted in Virginia in 2010 revealed 90 percent of disabled credentials were being used illegally.³⁷ A system of parking placards carries high costs yet delivers limited benefits. While it may not be desirable nor even feasible to expend significant public resources to enforce payment, Culver City can secure an easy win by reducing placards distributed to government employees and by upholding parking payment requirements for those with placards. Incremental revenues can then be put towards mobility programs that more directly target populations in-need.

Beyond simply raising meter rates yet keeping them fixed throughout the day and reducing placard exemptions, research supports a market-based, technology-enabled approach to curb pricing, called **performance-based pricing**.³⁸ Termed the “Goldilocks Principle” by Shoup, this method involves **charging sufficiently for parking with the aim of maintaining a minimum vacancy target** (85 percent occupancy, leaving one or two spots open) achieves the optimal level of parking. Maintaining a target vacancy rate at all times is preferred over setting arbitrary prices then observing the impact on overall occupancy, which can be a misleading metric over long observation periods.³⁹ Shoup suggests, at any given time, approximately 30 percent of traffic in commercial areas is generated by people circling for parking.⁴⁰ Optimized parking pricing encourages mode shifts for those who are most price-sensitive during peak periods, reduces time and fuel spent cruising for empty parking spots for those who opt to drive, and just so happens to increase public revenues from metered parking.

In 2019, parking meter payments contributed nearly \$14 million, or around 3 percent of Culver City’s annual revenues. A secondary effect of more meter installations, higher and more responsive meter rates, as well as other targeted efforts such as reduction of placard exemptions (detailed below) would be increased revenues for the General Fund and various public projects. **We estimate that parking revenues could increase 20-50 percent to reach up to \$30 million annually**, based on similar exercises in Los Angeles,⁴¹ Boston,⁴² and Seattle.⁴³ Even while up-

37 Manville, M., & Williams, J. A. (2012). The Price Doesn’t Matter If You Don’t Have to Pay: Legal Exemptions and Market-Priced Parking. *Journal of Planning Education and Research*, 32(3), 289–304.

38 Shoup, D. C. (2011). *The High Cost of Free Parking*. Chicago: Planner’s Press.

39 Manville, M., & Chatman, D. (2015). Market-Priced Parking in Theory and Practice. *Access Magazine*.

40 Shoup, D. (2015). Cruising for Parking. *Access Magazine*.

41 Shoup, D. (2018). *Parking and the City*. New York, NY: Routledge.

42 City of Boston. (2018). Performance Parking: Final Report. Retrieved from https://www.boston.gov/sites/default/files/embed/p/performance_parking_final_report_-_web_1.pdf

43 City of Seattle. (2013, June 28). Comprehensive Annual Financial Report. Re-



front costs may be significant, experiences of other cities tells us that net revenues grow upon implementation of a performance pricing program. Community members are more likely to be supportive of new parking measures once it is understood that additional parking revenues would be reinvested into new mobility projects, or other local Transportation or Public Works initiatives to address equity concerns. Importantly, we stress that the aims of performance pricing are not to maximize revenues, but are intended chiefly to improve the experience of parking and circulation. On its own, stimulating parking turnover and parking availability has positive economic impacts on local businesses, and efficient use of the curb has heightened consequences during current times, as illustrated by the growing necessity for curbside pickups and quick take-out stops during the coronavirus pandemic.

Culver City Parking Pilot Proposal

Performance pricing in action has shown to be an effective deterrence-based technique to manage travel behavior, most notably by San Francisco's 2011 pilot program for dynamic parking management. Between 2011 and 2013, the San Francisco

Metropolitan Transportation Authority conducted its SFpark pilot project for a performance pricing parking system, evaluating a set of dynamically-priced areas, priced between \$0.25 to \$6.00 per hour, against a set of control areas. The program demonstrated that the amount of time that blocks were completely full decreased 16 percent in pilot areas while increasing 51 percent in control areas. Traffic volumes decreased by 8 percent in areas with increased parking availability, while volumes increased by 4.5 percent in areas with worse parking availability.⁴⁴

SFpark is one of the most sophisticated examples of dynamic pricing at work, enabled by high-tech sensors and expensive monitoring programs. While San Francisco was able to harness technology to demonstrate the viability of a truly demand-responsive system, **we recommend that Culver City take a simplified approach to variable-rate congestion pricing by taking cues from Seattle's dynamic pricing model.** A low-cost approach would entail variable-rate pricing for a limited number of periods, does not quite approach instantaneous time-of-day fluctuations, yet still creates a spectrum of rates that are effective in modifying travel behav-

trieved from <https://www.seattle.gov/Documents/Departments/FAS/FinancialServices/CAFR/comprehensive-annual-financial-report-2012.pdf>

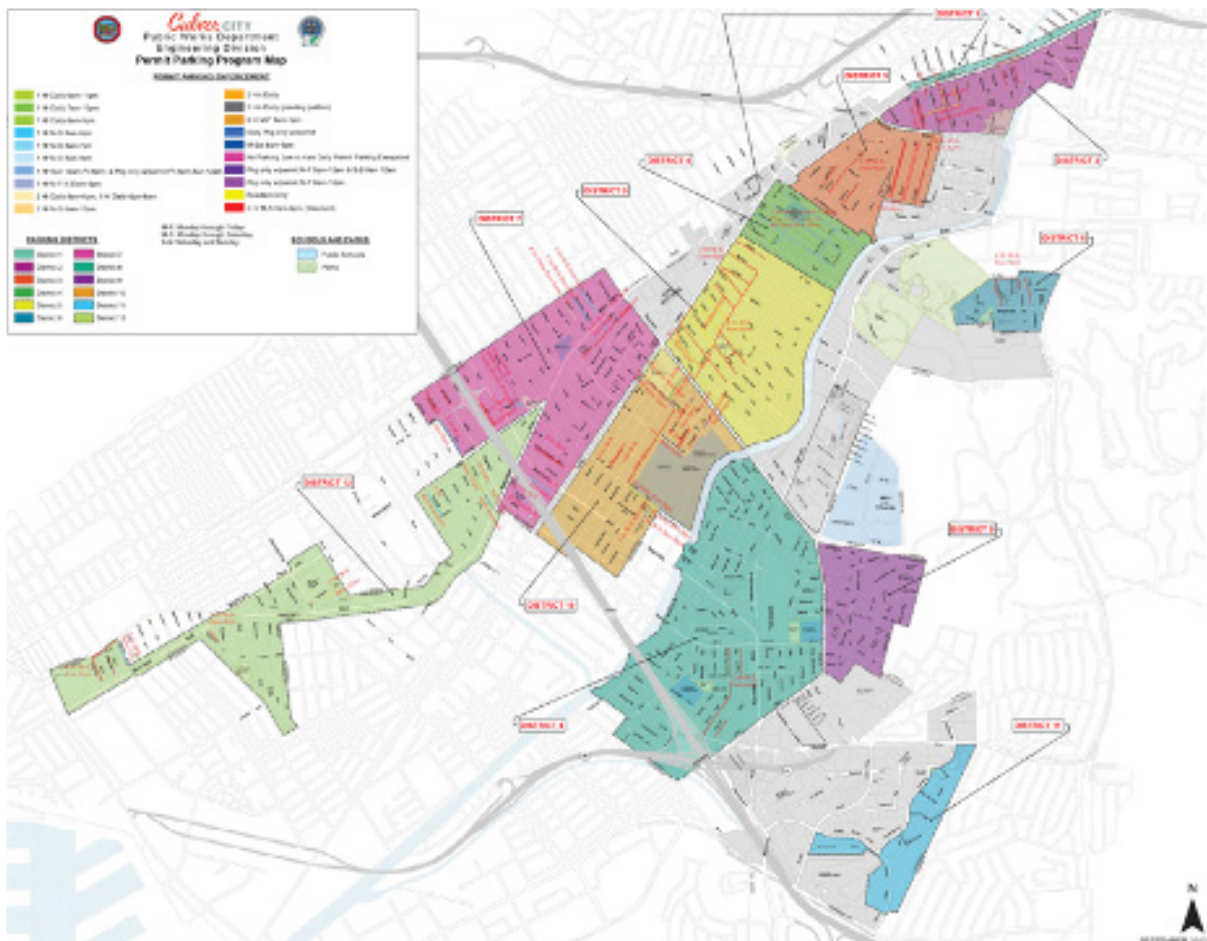
44 San Francisco Metropolitan Transportation Authority. (2014). SFpark Pilot Program Evaluation. Retrieved from <https://www.seattle.gov/Documents/Departments/FAS/FinancialServices/CAFR/comprehensive-annual-financial-report-2012.pdf>

ior. Besides being more cost-effective to administer, a simplified variable-rate congestion pricing system has the added benefit of greater transparency. While high-tech pricing systems have the ability to adjust rates in real-time, they necessitate accompanying app (or other tech) solutions to continuously transmit updated information to the public. Individuals are more likely to adjust travel behavior if made aware of the different pricing periods and rates in advance of a trip⁴⁵ - this is possible via publication and public communication of the established rates and time intervals.

There are currently 2,054 smart parking meters in place across Culver City, and just recently in 2019, City Council adopted a resolution authorizing the installation of 558 new smart meters in 327 different locations throughout Culver City.⁴⁶ This presents a prime opportunity to pilot new meter rates and a congestion pricing system to coincide with the installation of new smart meter infrastructure.

Culver City is currently composed of 13 parking districts based on various permit schemes. Due to Culver City’s size and connectivity, **we recommend that Culver City conduct a parking survey to establish a parking baseline in each of the districts.** The resources required to conduct a 100 percent sample of the on-street parking system across the entire city would be cost prohibitive; rather, the Public Works Department, perhaps in consultation with outside expertise, may elect to observe a representative sample of parking nodes (e.g., a block) which capture a range of parking behaviors - at least one in each district, and up to two in busier districts such as Downtown Culver City and Washington West.

Map 5. Culver City Parking Program Map



45 City of Boston. (2018). Performance Parking: Final Report. Retrieved from https://www.boston.gov/sites/default/files/embed/p/performance_parking_final_report_-_web_1.pdf

46 City of Culver City. (2018, November 18). CC - (1) Adopt of a Resolution (a) Establishing Specific Locations for the Installation of Parking Meters Within the City's Parking Meter Zones



Baseline metrics should be established by first determining parking inventory, then by capturing the following data (at a minimum) for each node, segmented by stall type (based on time or use restrictions), over the course of a single weekday⁴⁷:

- Hourly occupancy counts
- Parking turnover rates
- Parking duration-of-stay
- Placard usage rates

Arriving at an understanding of the characteristics of the parking supply helps to determine peak period occupancy and the times during which this congestion occurs. It enables Culver City to evaluate parking performance in relation to an 85 percent occupancy target, to segment parking periods (e.g, morning, afternoon, and evening) according to different parking behaviors, and finally, to adjust prices accordingly.

To illustrate, for a given hour, or across multiple hours:

- if observed occupancy is over 85 percent, increase the rate by \$0.50 per hour
- if observed occupancy is between 70 percent and 85 percent, leave the rate as-is
- if observed occupancy is below 70 percent, decrease the rate by \$0.50 per hour

...all within the established pricing range (e.g., \$0.50 to \$5.00), and while ensuring that adjacent districts have comparable rates at all times. A well-structured performance pricing program would achieve more charging points, lower average parking prices, higher occupancy, and higher parking revenues.

⁴⁷ Rick Williams Consulting. (2017, January). Guidance and methodology adapted from: New Orleans Parking Utilization Study and Assessment. Retrieved from <https://www.nola.gov/dpw/documents/chapter-4d-parking-management/>

PARKING CASE STUDIES

	Seattle ¹	Sacramento ²	San Francisco ³
Parking Strategy	Performance pricing program with the specific objective to set street parking rates so that one to two spaces are available on each block throughout the day.	Sacramento has eliminated requirements in the CBD and for projects smaller than 6,400 sq ft in the Central City. For all other areas requirements are based on neighborhood context, access to alternative modes, and existing parking supply..	SF requires unbundling in downtown commercial and residential zones for residential structures over 10 dwelling units, and requires all new residential developments to provide one parking space for each 200 housing units.
Context	Performance pricing was launched in 2010 when the City Council directed the Dept. of Transportation to adjust on-street parking rates to help drivers find parking more easily.	In 2012, the City of Sacramento revised its Zoning Code to bring more flexibility for parking requirements in urban areas.	Faced with rapidly rising housing costs and congestion issues, SF launched a 2010 Value Pricing Pilot to evaluate unbundled parking and car-sharing policies in residential buildings.
Results	Data from parking studies indicates increased parking availability, and that parking spaces are consistently turning over for new customers and visitors, with few vehicles staying longer than three hours.	Sacramento's code changes resulted in many projects with less than 1 parking space per unit, and have contributed to higher development activity - since the changes, over 1,000 units of mid-rise residential and mixed use projects that have been proposed and approved.	Unbundled parking, combined with carsharing, significantly reduced household vehicle ownership rates; apartments had an average vehicle ownership rate of 0.76 vehicles/unit compared to 1.05 vehicles/unit for apartments without these offerings.
Revenue Allocation	From 2011 to 2012, Seattle saw a 23% (\$6.4M) increase in gross parking revenue. Seattle uses the revenue to fund its transportation system and maintain streets and sidewalks in disrepair.	N/A	N/A

1 Performance-Based Parking Pricing Program. (n.d.). Retrieved May, 2020, from <https://www.seattle.gov/transportation/projects-and-programs/programs/parking-program/performance-based-parking-pricing-program>
 2 Housing Policy Toolkit (Rep.). (2018, December 3). Retrieved May, 2020, from Sacramento Area Council of Governments website: https://www.sacog.org/sites/main/files/housing_policy_toolkit_appendix_included_2018-12-3.pdf
 3 Parking Requirements & Unbundling. (2015, September 09). Retrieved May, 2020, from <https://parkingpolicy.com/reduced-requirements/>



KEY TAKEAWAYS

Seattle Since 2011, Seattle has made over over 150 rate changes to refine its program, underscoring the need to continually evaluate and adjust performance pricing.

Sacramento Sacramento highlighted the importance of community engagement; City officials frequently sought feedback from neighbors to develop improved parking management strategies where new projects had greater than anticipated impacts on the neighborhood.

San Francisco Parking unbundling can be effective in reducing car ownership rates, and should be implemented in conjunction with other complementary parking measures to increase impact.



03

Congestion Pricing

A once radical strategy, now becoming more popular and relevant

Key Recommendations

- Push regional dialogue to implement freeway congestion pricing
- Introduce corridor congestion pricing in major arterials in Culver City
- Identify optimal traffic speed range for major arterials by factoring in objectives for road safety, health, environment, etc.
- Introduce dynamic pricing to keep traffic flowing within the optimal speed range
- Limit exemptions for a congestion charge
- Rebate low-income motorists to address equity concerns
- Use resulting revenues to introduce traffic calming interventions on nearby neighborhood streets to prevent traffic spillover

Benefits:

- Significant Impacts
improve allocation of road space and mitigates traffic congestion in Culver City
- Generate Revenue
while the primary purpose is to reduce congestion, follow-on effects include additional revenue for the City
- Positive City Image
Can transform its image from a car-centric city typical of Southern California to a global leader of sustainability as an early adopter of congestion pricing

Risks:

- Implementation challenges
- Neighborhood opposition

Considerations:

- Equity
- Revenue recycling



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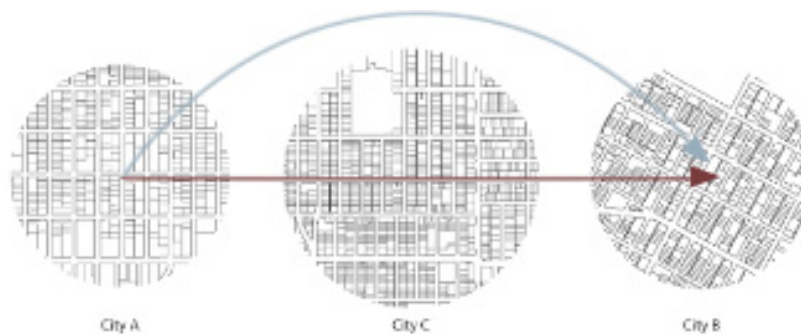
Traffic, especially cut-through traffic, emerged as one of the major issues in the 2017 Culver City TOD Visioning Study. Many believe that external traffic, with neither trip origins nor destinations lying within Culver City, is purely detrimental to the mobility of local residents and employees. However, in a metropolitan region composed of 88 cities, and with municipal boundaries arbitrarily defined, it is entirely inevitable that some travelers must “cut-through” some municipalities in order to reach their destinations.

Put simply, if City C is sandwiched between City A and City B, travelling between A and B necessitates cutting through City C (Figure 2). One might make an argument for rerouting trips around Culver City, but unless Culver City residents are willing to concede their own use of stretches of road in other municipalities, this argument falls short. **A more appropriate framing of the issue may simply be an excess of traffic.** Because Culver City is expected to grow steadily in terms of population and its econ-

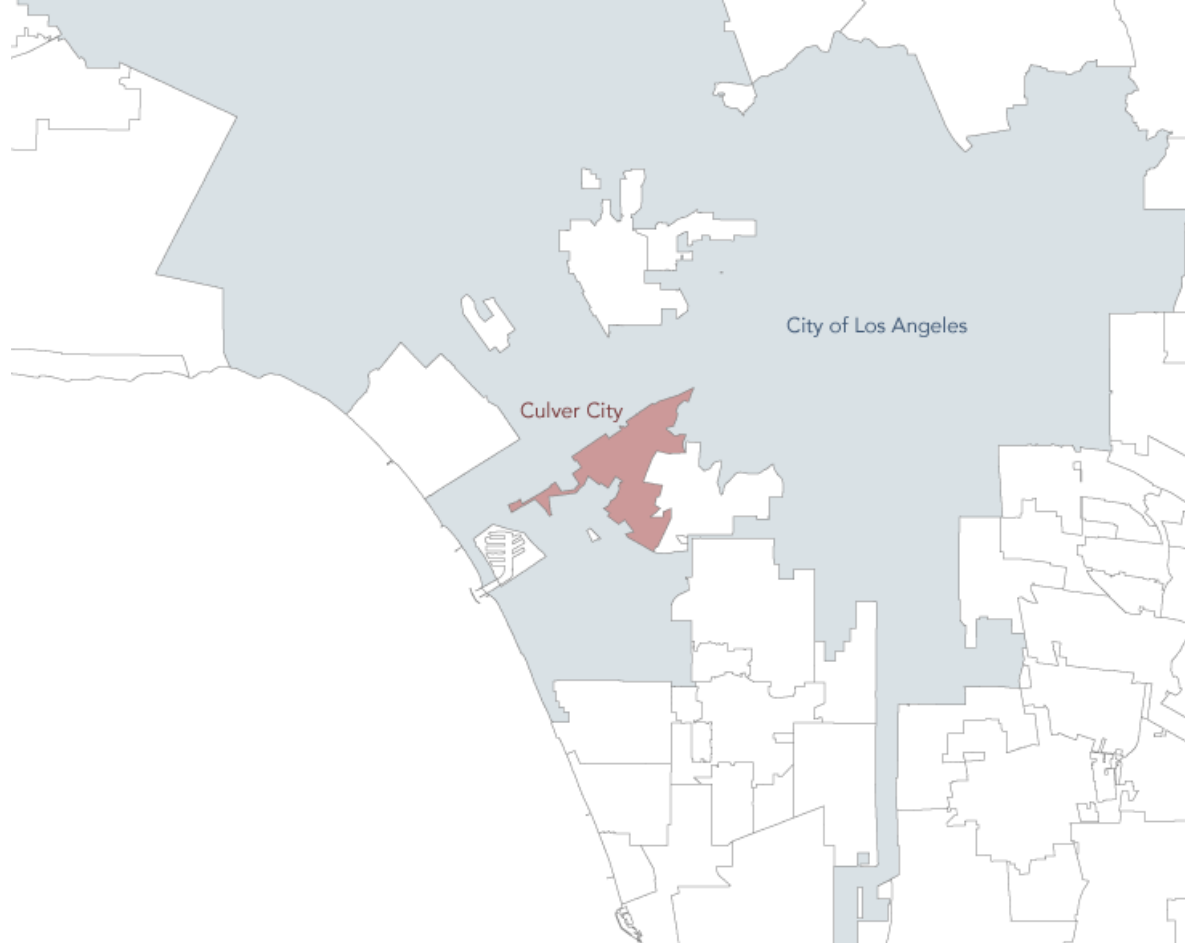
omy, implementing congestion pricing to better allocate its limited roadspace and manage traffic can encourage sustainable growth.

Transportation scholars nearly universally agree that **pricing is the foremost solution for congestion.**⁴⁸ Congestion occurs where people travel in limited space during the same period of time. From an economic perspective, congestion demonstrates that roads are “underpriced” and demand exceeds road capacity. For decades, planners and engineers have tried to address congestion using supply-side interventions, such as adding road capacity and expanding transit service. Such efforts are largely unsuccessful, as drivers quickly adapt to added capacity, adjusting travel patterns to once again congest the roads. It is also costly, perhaps even ill-considered, to build our infrastructure system in accommodation of peak demand. As a demand-side solution, congestion pricing can effectively manage the demand for driving using direct pricing mechanisms, at minimal cost.

Fig. 2: Through Traffic Diagram



48 King, D., Manville, M., & Shoup, D. (2007). For whom the road tolls: The politics of congestion pricing. Access Magazine.



Map 6. "Landlocked" Culver City

Several cities in the world, including Singapore, London, and Stockholm, have demonstrated the efficacy of various congestion pricing schemes. With its cordon scheme, Stockholm has experienced a 20 percent reduction in average traffic volume, which has remained steady despite the city's continual growth.⁴⁹ Northern American cities such as Los Angeles, San Francisco, Vancouver, Seattle are giving serious consideration to congestion pricing, and New York City is expected to launch its congestion pricing program as soon as Fall 2020. Culver City can join this list of progressive cities to explore the option and understand what an effective congestion pricing program could look like here.

Our proposal for congestion pricing is preliminary, and theoretical in nature. We focus on identifying potential areas or corridors for program implementation, discuss potential pricing structures and use of revenue, and highlight important social and performance considerations via case studies and literature reviews. Simulation of travel demand changes using transportation models, feasibility analysis, and review of the technical details of implementation are key aspects of congestion pricing programs that will require further study beyond the scope of this exploratory report.

⁴⁹ Eliasson, J. (2014). The Stockholm congestion charges: an overview. Stockholm: Centre for Transport Studies CTS Working Paper, 7, 42.



Current Conditions

According to the 2019 INRIX Traffic Scorecard, Los Angeles ranks sixth for the most congested cities in the U.S., with drivers here losing 103 hours annually to peak-hour congestion.⁵⁰ Traffic has only been getting worse, with a four percent increase in hours lost compared to 2018 (despite more favorable adjustments to INRIX's calculation method). Despite such severe congestion, bikes and public transit remain impractical alternatives to personal vehicles in Los Angeles - commuting by bike or by transit can take more than twice as long as by personal vehicle.⁵¹

Los Angeles has three of the top 10 most congested corridors in the nation; they are, respectively, segments of I-5, US-101, and I-405 between US-101 and I-105 (i.e. the segment which intersects with Culver City).⁵² Interestingly, cities such as Boston, Philadelphia, and Washington, D.C., though ranked higher in terms of hours lost to congestion, lack such exceedingly congested corridors. Los Angeles, in comparison, has congestion that is less evenly distributed across the region and across its net-

works. Southern California Association of Governments (SCAG)'s 2019 study shows that the Westside of Los Angeles exhibits the most severe congestion, which is concentrated on highways and corridors in close proximity. On any given day, spillover traffic from freeways can back up onto the arterials for up to a mile across all lanes, and speeds can dip as low as 5 miles per hour during the evening peak hours.⁵³

In terms of connectivity, the Santa Monica (I-10) and San Diego (I-405) Freeways provide regional access to Culver City, while key arterials including Sepulveda Boulevard, Venice Boulevard, Washington Boulevard, Jefferson Boulevard, and Culver Boulevard help facilitate regional circulation (Map 7). These key arterials also serve as the major commercial corridors in the City, and consequently, have more parcels dedicated to parking (Map 8). Moreover, they will most likely experience rapid changes to traffic patterns due to their proximity to major new developments.

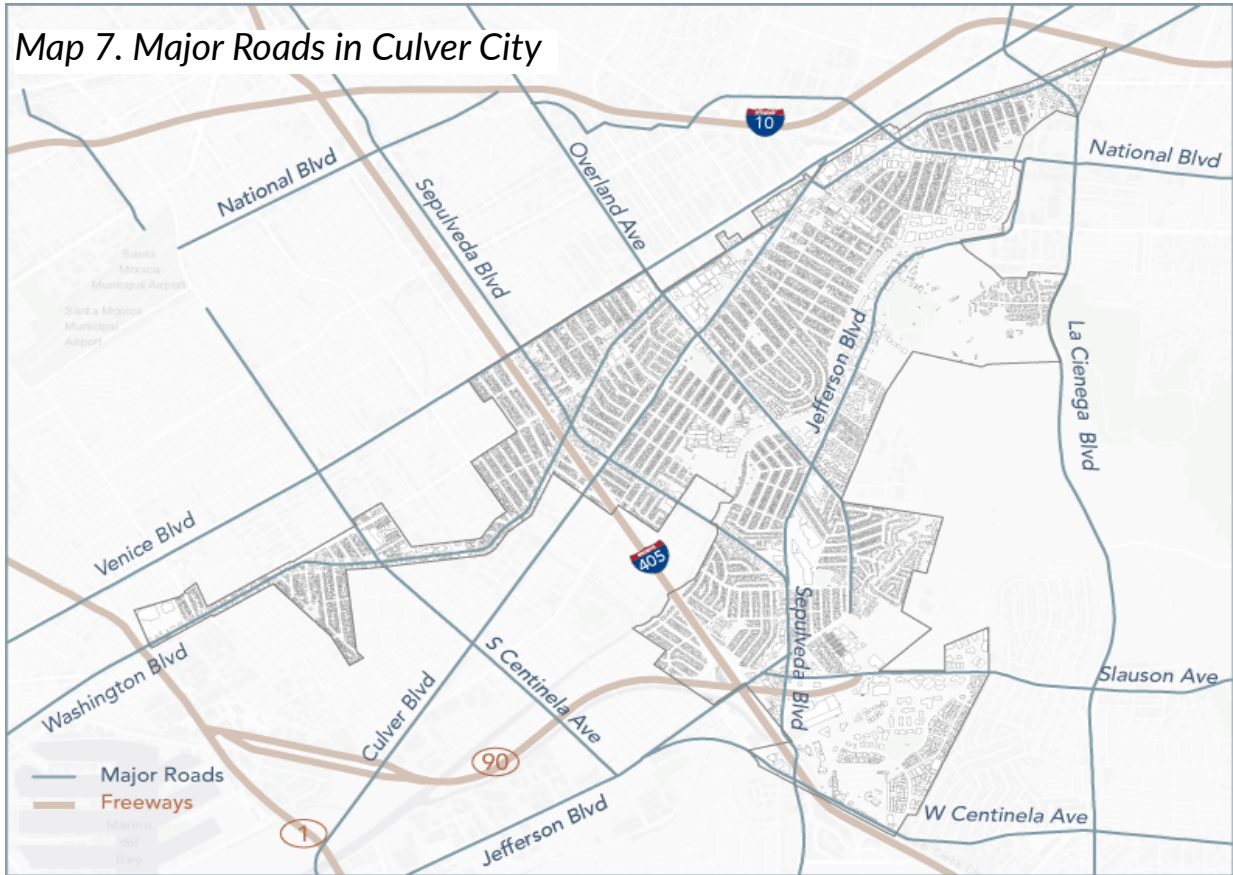
50 Inrix. (2020). NRIX 2019 Global Traffic Scorecard. Retrieved from <https://inrix.com/scorecard/>

51 Ibid.

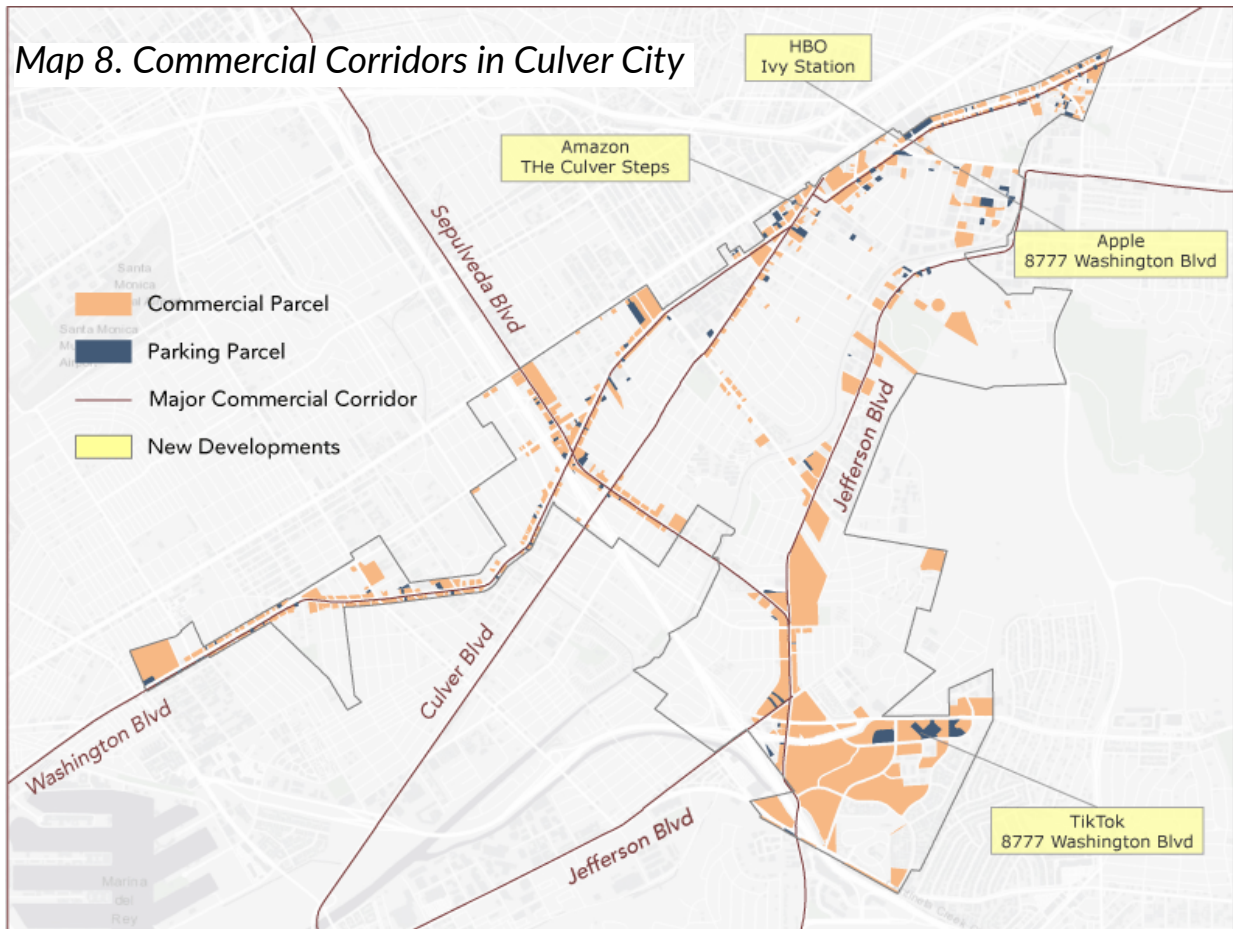
52 Ibid.

53 SCAG. (2019, March). The Mobility Go Zone & Pricing Feasibility Study.

Map 7. Major Roads in Culver City



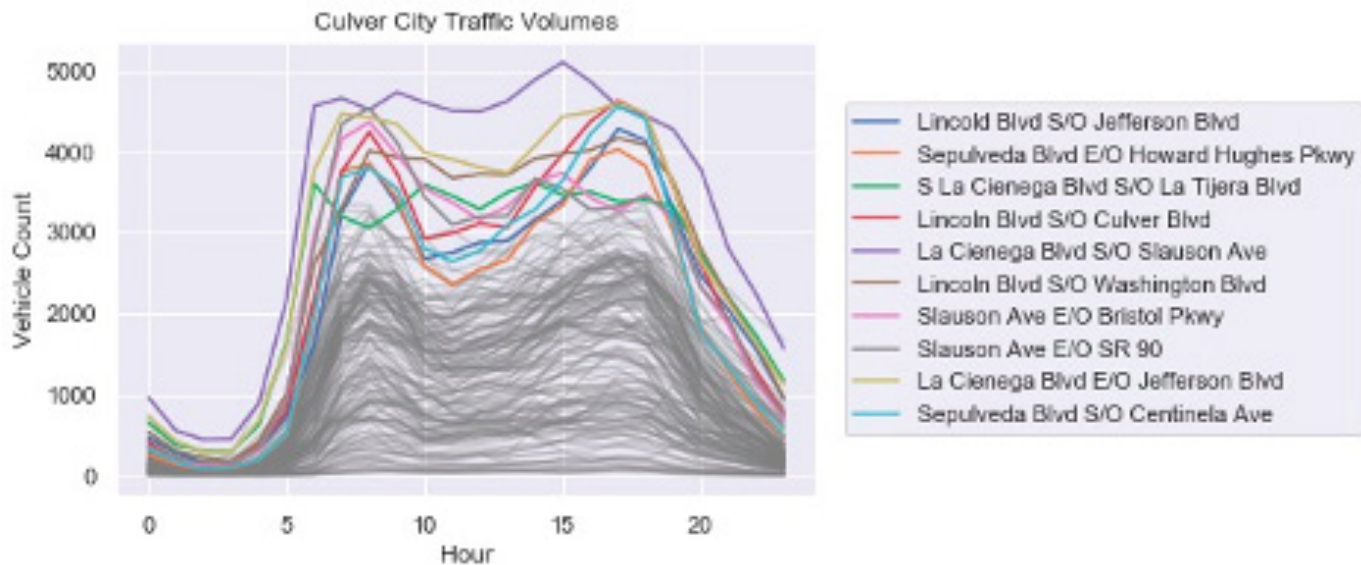
Map 8. Commercial Corridors in Culver City

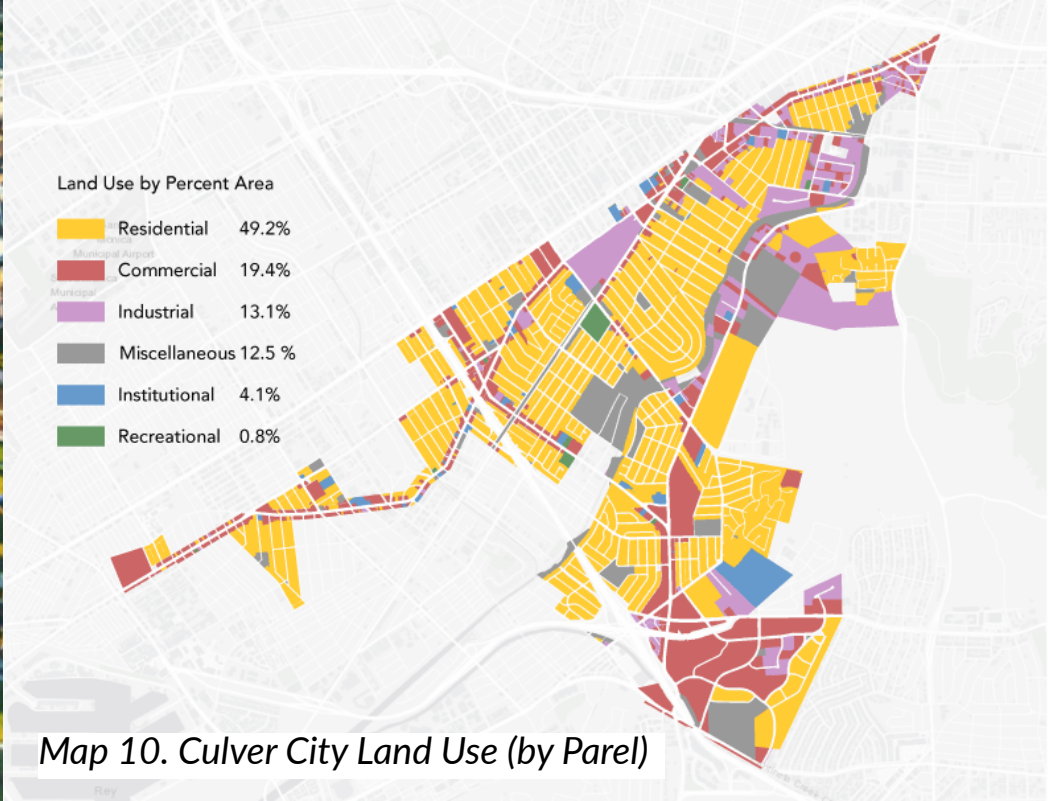




Zooming in on Culver City, intersections that are near the freeway on- and off-ramps and those that serve as the point of convergence between two major arterials experience the most traffic. Figure 3 displays that those few intersections are disproportionately burdened by peak hour traffic, while the differences between peak and non-peak hour traffic are less obvious in most neighborhood streets. However, due to its triangular shape, Culver City contains only short segments of many major arterials, leaving many of its busiest intersections on the edge of the City or even outside its boundaries.

Fig 3. Culver City Traffic Volumes





Map 10. Culver City Land Use (by Parcel)

Congestion Pricing Recommendations

Not quite yet a regional hub, Culver City has limited potential for the implementation of a cordon scheme. Cordon pricing, the most common application of congestion pricing, is a deterrence-based strategy that imposes a fee on drivers as they enter a defined geographic area, usually a Central Business District (CBD). The congestion zones in the inner parts of London and Stockholm are the most well-known examples of cordon schemes. By charging to enter prime destinations, cordon pricing generates a significant reduction in vehicular traffic and greatly impacts mode choice. However, such a scheme is less workable in decentralized urban contexts, such as those found in Southern California. With multiple potential “CBDs,” pricing multiple, scattered job centers may influence route choices for those in immediate areas, but is less likely to address the sources of a regional congestion problem.

SCAG has studied potential areas for cordon pricing in West Los Angeles, and has drawn similar conclusions about the difficulty in delineating cordons due to its polycentric nature and lack of natural boundaries.⁵⁴ Potential cordon congestion pricing areas SCAG examined include Downtown Los Angeles, the City of Santa Monica, and areas around LAX and Hollywood. Although the study focused on West Los Angeles, Culver City was not considered as a candidate. Culver City’s current business clusters in downtown and in Fox Hills are important job centers in West Los Angeles, but their influence is diminished at regional and national levels. About half of Culver City is for residential use and only 20 percent is reserved for commercial use (see Map 10). Accounting for this spatial distribution and land use composition, we conclude that **defining and justifying a cordon pricing area within Culver City is a highly complex and ultimately arbitrary exercise that would produce few winners.**

⁵⁴ SCAG. (2019, March). The Mobility Go Zone & Pricing Feasibility Study.



Potential Congestion Charge for Freeways and Arterials

As outlined earlier in our report, we are careful to distinguish between healthy levels of congestion, which can be a marker of vitality, and levels of congestion that are entirely destructive to local prosperity. **The goal for congestion pricing should be keeping traffic flowing**, rather than eliminating vehicular traffic or maximizing revenues. Keeping this singular goal in focus will ensure that any potential adverse impacts of congestion pricing to Culver City's competitiveness will be minimized. Since the demand for road space varies over time, the right price, intuitively, should be dynamic and based on the real-time traffic conditions. Given that freeways and arterials are very different in nature, congestion charges will be discussed respectively.

Freeways are top candidates for congestion pricing in the Greater Los Angeles region, but the main challenge is in the regional coordination required.

Urban freeway congestion is the most salient congestion problem in Southern California, as previous analyses have shown. Freeways intrinsically serve a simple purpose - to accommodate high-speed traffic flows to provide connections within and between cities. Due to their nature, freeway congestion pricing schemes are easier to design than cordon pricing schemes, as they address different goals and priorities. Freeway congestion pricing is more feasible because boundaries are well-defined due to limited entry points (ramps). Moreover, the region already has some experience with freeway pricing in the form of high occupancy toll (HOT) lanes on the 10 and 110.

The biggest hurdle facing more widespread adoption of freeway congestion pricing is the level of regional coordination required in a federalized system. The State of California (via Caltrans) owns and operates the interstates, while freeways cross many municipalities. In Los Angeles County alone, 66 out of 88 cities have freeways. SCAG is charged with coordination of land use and transportation planning

between regional, state, and local government agencies, and would be required to lead the charge in pushing for regional freeway congestion pricing under such conditions of extreme jurisdictional complexity.

Freeway Congestion Charge

Given high degrees of access control, freeways generally follow a backward-bending relationship between speed and flow. This means that roads are most productive when lots of cars are moving freely - maximized when a road reaches its critical density. This optimal vehicle density and its associated traffic speed (critical speed) are the key parameters to understanding the relationships between flow, speed, and density relationships. Adding vehicles beyond a certain density level will reduce both speeds and traffic volume, and can lead to a breakdown in traffic flow which requires a lengthy period of time to return to free flow.⁵⁵ The implications here are simple: if the goal is to maximize volume, then target speed should be set slightly higher than critical speed (since operating at critical speed is highly unstable, with no usable gaps⁵⁶), and congestion charges must only be high enough to prevent traffic from reaching the target speed. If the goal is to maximize speed, then charges should be designed to keep traffic flow at desirable speeds.

In practice, it is easier to set congestion charges according to desired speeds rather than calculating the critical speed for each freeway segment. Again, with controlled access and no stopping points, freeway congestion charges can be adjusted frequently (e.g., in half-hour intervals) to raise the charge if actual speeds are lower than the optimal speeds, or otherwise lowering the charge.

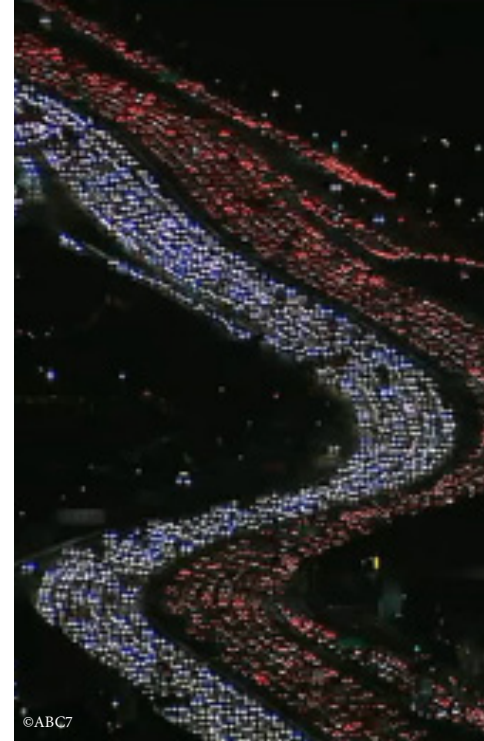
Even if a comprehensive freeway congestion pricing system were to be implemented, however, this alone would be insufficient to address the issue of local congestion in Culver City. Freeway pricing may be effective at managing traffic on the freeways, but this in turn may lead to issues of spillover traffic in the surrounding areas, particularly along arterials. Culver City is likely to continue to struggle with local traffic even if freeway pricing is in place. Regardless of the viability or presence of freeway pricing, what are the solutions for small municipalities such as Culver City?

Corridor congestion pricing appears to be promising.

Corridor pricing on major arterials that run parallel to priced freeways, within a designated buffer distance, may help to mitigate traffic problems, with or without active freeway congestion pricing. However, due to the size, scale, and shape of Culver City, an effective corridor congestion pricing scheme would still require regional coordination, or at least partnership with its neighboring city, the City of Los Angeles.

⁵⁵ Varaiya, Pravin. (2005). What We've Learned About Highway Congestion. Access Magazine, 27: 2-9.

⁵⁶ FHWA. (2018). Traffic Data Computation Method Pocket Guide.



Corridor congestion pricing on major arterials that run parallel appears to be a promising solution to spillover traffic from freeways.



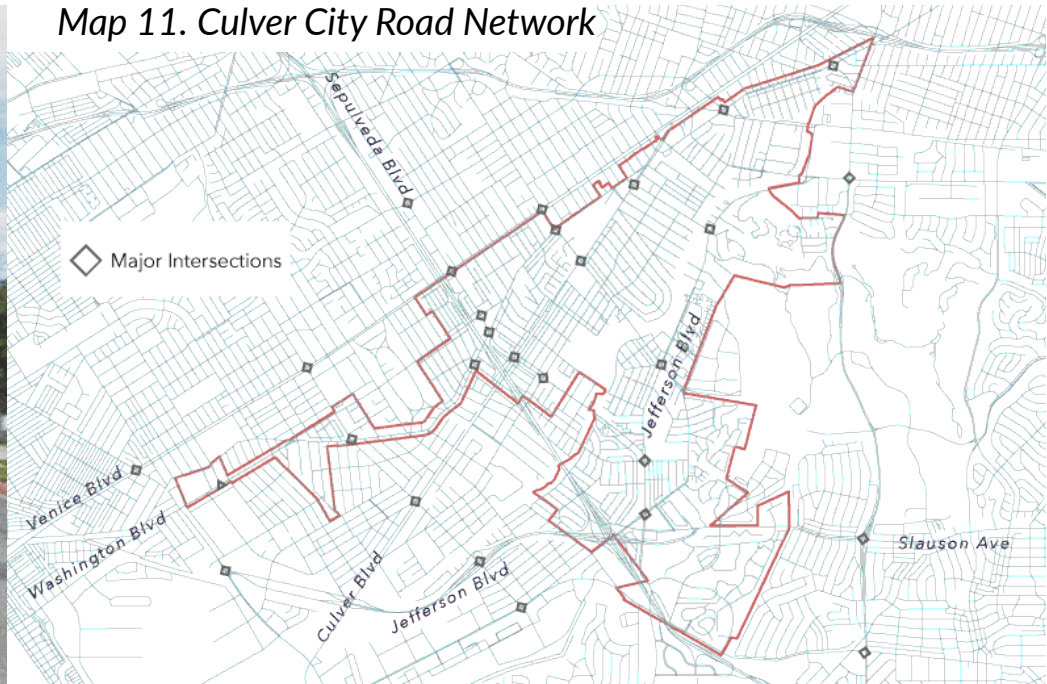
The major roads used by motorists traveling from east to west (including Washington Blvd., Venice Blvd., Culver Blvd.), and north to south Los Angeles (including Sepulveda Blvd., Jefferson Blvd., La Cienega Blvd.) are potential candidates for corridor pricing. Yet, some arterials, such as Venice and La Cienega, lie tangent to Culver City, and thus it is practically and politically difficult to include them in a local scheme without regional coordination. Hence, we recommend that **Culver City start with Washington, Culver, Sepulveda, and Jefferson Boulevards as candidates for corridor congestion pricing.**

One major, valid concern is with regard to potential spillover traffic from the arterials onto neighborhood streets. Map 11 shows that many neighborhood streets in Culver City have limited connectivity, largely due to geographic features (e.g., Ballona Creeks and Baldwin Hills). This suggests that nearby neighborhoods will be less likely to experience significant increases in traffic due to priced arterials compared to a fully-connected grid system. Nonetheless, there are several strategies Culver City can implement to address the issue of spillover traffic. The City can apportion revenues from a congestion pricing system to introduce traffic calming interventions, further reducing the appeal of nearby neighborhood streets for driving. Culver City might also strategically convert some segments of nearby neighborhood streets into bike boulevards to allow only cyclists and pedestrians to pass through, with minimal infrastructural costs. Beyond these strategies, the City can explore more technical strategies of monitoring and charging traffic spillover, requiring more sophisticated studies and further modelling.

© Front Page



Map 11. Culver City Road Network





Culver City Corridor Congestion Charge

Unlike freeways that serve a narrow purpose with limited exposure to externalities, community members tend to have different goals, ideas, and priorities for major arterials. Some regard arterials as having the potential to serve as vibrant commercial corridors, others feel they must serve as transit corridors with dedicated bus lanes; still others may believe they should facilitate movement of all kinds. However, arterials are designed to supplement the urban interstate system by connecting major activity centers of metropolitan areas and providing a high degree of mobility while directly serving abutting land use. Major arterials must facilitate vehicular traffic while factoring in the urban context and diverse access points; put simply, **their purpose is to keep local traffic flowing, at reduced speeds relative to freeways.**

Though it is uncommon to price arterials, Singapore's electronic road pricing (ERP) system includes a few arterials with heavy traffic. ERP gantries are placed along the selected arterials and rates are adjusted to keep traffic moving at an optimal speed range of 20 to 30 kilometers per hour (approximately 12.5 to 18.5 miles per hour).⁵⁷ Currently, the speed limit for major arterials in Culver City ranges from 35 to 40 mph, while during peak hours, the speeds can slow to 5 mph. This disparity suggests that **establishing a pricing system to target an optimal speed range may help ensure more consistent flow of traffic while preserving road safety.** Further studies are required to identify the optimal speed range and possible locations for detection devices.

If, or when, freeway congestion pricing is implemented, Culver City will need to account for the real-time freeway charges. One possible approach is to establish a price index for arterials within a certain distance buffer around freeways to reflect freeway congestion charges. This can help to balance the traffic between freeways and major arterials, and prevent traffic spillover. A preliminary suggestion is to charge higher rates for long-distance travel along arterials parallel to priced freeways. In other words, traveling on major arterials for long distances would require premium charges comparable to those found on freeways.

⁵⁷ Land Transport Authority of Singapore. (2020, April 30). Electronic Road Pricing. Retrieved from <https://www.onemotoring.com.sg/content/onemotoring/home/driving/ERP.html>



To maximize the efficacy of a congestion charge, **limitations should be placed on the issuance of exemptions or provisions for a daily cap on charges.** In the ideal scenario, only public transit and emergency vehicles would be exempt, with no daily cap. The advantages of such an approach are discussed in the case study section. It is important to keep in mind that congestion pricing charges would be low, or even free, during most times of the day. In anticipation of potential concerns raised by residents, the City may choose to exempt or provide a discount for Culver City residents. In the case of London, Transport for London provides a 90 percent discount for residents of the congestion zone.⁵⁸

We reiterate that a successful congestion pricing program for Culver City would require regional coordination. The hope is that Culver City can trigger paradigmatic shifts for the region and lead to a win-win situation for everyone.

A thoughtfully-designed corridor pricing system enhances circulation, and does not carry the same economic risks of a cordon scheme, which may dampen economic activity in Culver City's downtown areas. Congestion pricing does not eliminate traffic - the goal is to nudge a few drivers to change their behavior, just enough to keep traffic flowing at desired levels. By pushing forward with a congestion pricing scheme, Culver City can establish itself in the region as **a progressive first-mover**, thereby prompting other cities to follow suit in reaction. Should Culver City realize economic benefits from implementing congestion pricing, other cities are likely to imitate, leading to a bottom-up formation of a regional coalition.

58 Santos, G., Button, K., & Noll, R. (2008). London Congestion Charging. Brookings-Wharton Papers on Urban Affairs, 177-234. Retrieved June 6, 2020, from www.jstor.org/stable/25609551

CONGESTION PRICING CASE STUDIES

	Singapore ¹	London ²	Stockholm ³
Context	Due to heavy congestion in the CBD areas during the 70s, the state pursued automobile demand management strategies, including cordon pricing (1975). The Electronic Road Pricing (ERP) system replaced cordon pricing in 1998. The ERP system includes expressways and major arterials.	Strong mayor Ken Livingstone led progressive reform to address congestion problems in the City of London. London's cordon pricing scheme was adopted in 2003.	First introduced as a 7-month trial, enabled by party coalition with environmental groups. The trial was followed by a referendum where a majority voted in favor of the charges in 2007.
Pricing Scheme	Real-time adjusted price-charges vary by location, times of day, and vehicle types. US \$0 - \$3.00 on a per-pass basis at over 50 points within and surrounding the CBD. Monday-Saturday between 7:00am and 8:00pm	Fixed charge - a daily fee of £11.50 (~\$14.5) Weekdays between 07:00am and 6:00pm	Variable charge for weekday daytime - depending on the time of the day; Maximum charge is 60 SEK per day (~\$8.5).
Exemptions	Emergency vehicles, civil defence emergence vehicles.	Two-wheelers, emergency vehicles, vehicles used by or for disabled people, public buses, licensed London taxis and minicabs, some military vehicles, and roadside assistance and recovery vehicles, alternative fuel vehicles.	Emergency vehicles, buses, diplomatic vehicles, disabled persons vehicles, military vehicles, hybrid or electric cars, motorcycles and mopeds, and foreign-registered vehicles.
Discount	N/A	90 % discount for residents within the Congestion Charged Zones.	100% discount for "land-locked area" where mainland is only accessible via the charged area.
Results	Inner city traffic was reduced by 24 % and average speeds have increased from 30-35 KPH to 40-45 KPH (18-22 MPH to 24-28 MPH) despite of population growth.	The number of private cars entering the zone fell 39 percent between 2002 and 2014.	Average traffic volumes across the charged zone have dropped 22% and remained steady, even as the city has grown.
Revenue Allocation	Transit improvements; street improvements; TOD developments; Rebates program	Street and transit improvements and park-and-ride spaces	Transit improvements

1 Land Transport Authority. (n.d.). ERP. Retrieved from <https://www.mot.gov.sg/about-mot/land-transport/motoring/erp>

2 Santos, G., Button, K., & Noll, R. G. (2008). London congestion charging. Brookings-Wharton Papers on Urban Affairs, 177-234.

3 Eliasson, J. (2014). The Stockholm congestion charges: an overview. Stockholm: Centre for Transport Studies CTS Working Paper, 7, 42.



KEY TAKEAWAYS

Singapore's Electronic Road Pricing (ERP) perhaps is the best example of congestion pricing based on economic theory. The system adjusts prices based on real-time traffic data, and during periods of low demand, the charge can drop to zero. Different vehicle sizes are charged different rates; e.g., bigger vehicles take up more space and have greater impacts on traffic, and are therefore charged at a higher rate. Moreover, ERP places no daily limits on charges, and only exempts emergency vehicles and public transportation vehicles, avoiding pitfalls found in the London scheme. Congestion pricing should encourage trip-chaining and reduce the overall number of trips in the congestion zones; daily caps can diminish the impacts of congestion charges on individual travel behavior once a maximum charge is reached.

London's lengthy list of exemptions has eroded the effectiveness of its congestion pricing scheme. Between 2002 and 2014, the number of private cars entering the congestion zones has reduced about 40 percent in the congestion zones. However, the recent proliferation of private for-hired vehicles (such as Uber and Bolt) travelling for free across congestion zones has contributed to rising congestion levels and a subsequent decrease in bus ridership.⁴ In addition, London exempts alternative fuel vehicles and provides a 90 percent discount for residents within the congestion zones. These vehicles nevertheless compete for the scarce road space in Central London and partially offset the effectiveness of the program. Despite these pitfalls, **London shows how congestion pricing can help transform the built environment.** The City has allocated revenues from congestion pricing towards a number of road work projects to slow down traffic in its congestion zones and to reallocate road space to pedestrians, cyclists, and transit riders. These investments have gradually transformed its congestion zones into more sustainable, pedestrian- and bike-friendly urban areas.

⁴ Badstuber, N. (2018, April 12). London's Congestion Charge Is Showing Its Age. Retrieved from <https://www.citylab.com/transportation/2018/04/londons-congestion-charge-needs-updating/557699/>



Stockholm's congestion pricing scheme is a model for effective governance, demonstrating a path to public support for pricing something that has long been long perceived to be "free." Unlike Singapore or London, where congestion pricing was a top-down imposition, Stockholm passed its permanent congestion charge via a public referendum. Prior to the referendum, a 7-month trial allowed the results of congestion pricing to speak for themselves: the scheme demonstrated a significant decrease in road congestion and improved economic impacts. Following Stockholm's success, many municipalities have since touted congestion pricing as a method of raising revenues, increasing transit ridership, and improving air quality to gain public support. However, given that the primary purpose of congestion pricing is to reduce congestion, emphasizing other benefits (especially revenue recycling) may raise other questions around the proper allocation of revenues, or credible commitment problems.

In summary, congestion pricing should be designed to best reflect the underlying economic theory, and employ pilot programs to demonstrate its benefits to a broader public. Congestion pricing structures should mimic that of Singapore's ERP charge - real-time price adjustment based on traffic conditions, with limited exemptions, and no daily cap. Carefully designed, temporary pilot programs showcasing the efficacy of a program and its limited drawbacks can help win public support for congestion pricing before formalizing a program - a critical step to successful implementation, particularly in politically-sensitive environments such as those found in the U.S.



Key to Success

- Governance
- Equity Considerations
- Revenue Recycling
- External Relations & Messaging



Governance

While a case can be made for a number of different TDM approaches, the fact of the matter is, there remains structural impediments to developing and executing upon a cohesive demand management strategy in Culver City. Under the current system, the Community Development, Transportation, and Public Works divisions work in silos, with each overseeing different pieces of a larger mobility puzzle. Organizational complexity and ambiguity over roles and ownership can lead to performance gaps and major redundancies, and produce programming that may be at odds with various departmental goals.

Rolling out a comprehensive approach to parking management, for example, requires coordination between the Planning Division, which controls the supply of private parking, and the Mobility & Traffic Engineering Division, which is responsible for parking in the public right-of-way. In some cases, input from the Transportation Division is also necessary to resolve any impacts to bus stops and transit service. Independent decision-making for each facet of the parking in Culver City can quickly lead to policies that are out-of-sync, with divergent impacts to overall parking supply and resulting travel behavior.

Establishing a clear governance roadmap is crucial to the success of a comprehensive strategy to address the pernicious cycle of car culture in the region. Culver City's **Advance Planning Division** is best suited to lead interdepartmental coordination

and to head a cross-functional TDM committee due to its eye to long-range, far-reaching projects. Appointing a single owner of the long-term TDM agenda helps to ensure that day-to-day execution against strategy remains consistent and coherent across departments. A regular cadence of TDM committee checkpoints creates a venue for knowledge transmittal, data sharing, decision-making, and transparent communication within Culver City's government. This process improves efficiency by reducing duplicative efforts, and encourages pooling of resources and expertise, such as collaborative input on comprehensive traffic and parking studies, or technical decisions around the data access and management.

Importantly, Culver City officials must first come to an agreement on overall philosophy and management strategy as it pertains to mobility, then leave matters of implementation and adjustment to administrative procedure via committee. Meter rates, for example, would ideally be routinely adjusted by the TDM committee rather than require explicit political approval from elected officials each time.

Equity Considerations

Many low-income households are already burdened by the necessity of car ownership. Additionally, congestion charges are regressive, meaning they take a larger percentage of income from low-income earners than from high-income earners, often raising concerns that congestion pricing will disproportionately harm the poor. However, although

congestion charges are **regressive**, this **does not mean it is inequitable**.⁵⁹ Most public financing schemes in the U.S., such as fuel taxes, property taxes, and utility fees, are regressive, but their net impacts are progressive, meaning that wealthier individuals may pay more in absolute terms but a portion of revenues are transferred to the poor via specific programs and channels. In comparison to a sales tax, another popular funding mechanism, congestion pricing is more equitable because it is a user fee limited to drivers, and is not shouldered by low-income, zero-vehicle households. **A rebate program is a more direct way of assisting the limited number of low-income individuals** who may potentially be burdened by congestion charge, similar to how utility bills are subsidized for low-income groups.⁶⁰

Congestion pricing of roads and parking **exposes the cost of individual trips** but **does not necessarily increase the cost of driving, especially for the poor**. Congestion pricing can stimulate changes in travel behavior in three ways: by encouraging (1) use of alternative modes, (2) travel during alternative times, and (3) travel along alternative routes.⁶¹ This “triple divergence” presents individuals with an array of choices before they begin a trip, illuminating the tradeoffs between money and time, convenience, or comfort. Most individuals are willing to pay for time savings for highly valuable trips (e.g., in the case of a medical emergency). Low income drivers are already less likely to make trips during the peak hours, and in peak directions.⁶² This mismatch between trip characteristics and target trips does not automatically negate any equity concerns, but does suggest that many low-income car owners would not be subject to full congestion charges.

Revenue Recycling

The allocation of revenues arising from congestion pricing of our roads and parking spaces can be a contentious issue. Such revenues are often devoted to funding of transit and alternate modes - a logical application in such transit- and infrastructure-rich contexts as Singapore, London, and Stockholm. However, the current reality is that public transit or active transportation modes are poor substitutes for personal vehicles in most American cities. And, despite steady increases to transit funding in recent decades, ridership has been continually declining, perhaps drawing further skepticism about the suitability of ploughing additional revenues from pricing schemes into alternate modes.⁶³

To counteract these concerns, any incremental revenues from deterrence-based TDM approaches are **best spent on projects tailored to local needs and generating community benefits**. While improving public transit is a worthy cause, it may not be the top priority on local agendas. Culver

59 Schweitzer, L & Taylor B. 2010. “Just Pricing,” *Access*, 36: 2-7.

60 Manville, M. & Goldman, E. (2017). Would Congestion Pricing Harm the Poor? Do Free Roads Help the Poor? *Journal of Planning Education and Research*

61 Downs, A. (1992). *Stuck in Traffic*. Washington, DC: Brookings Institution.

62 Manville, M. & Goldman, E. (2017).

63 Manville, M., Taylor, B., Blumenberg, E. (2018). *Falling Transit Ridership: California and Southern California*.





City seeks to develop its bicycle and pedestrian infrastructure, as well as revitalize Ballona Creek, invest in affordable housing, and tackle the growing homelessness crisis. Given unprecedented levels of fiscal pressure on local governments today, officials might look to novel, once-improbable revenue streams. The three strategies in this report--employer TMA, parking management, and congestion pricing--were selected chiefly due to their potential for impact, and in part for their minimal capital requirements and/or secondary potential to produce incremental revenue for Culver City's mobility initiatives. Most importantly, by mandating revenues (particularly portions derived from regional freeway pricing schemes) to be spent according to local needs, Culver City can generate the requisite political support for congestion pricing and reap benefits from the resulting inflows.

External Relations & Messaging

It might be the case that City Council members need little convincing to take the radical steps necessary to transform mobility in the region; indeed, the biggest hurdle Culver City faces is in convincing members of the community and other regional actors of its vision of a sustainable city. It is imperative that **Culver City brings its neighboring cities** of Santa Monica and Los Angeles **into the fold** when contemplating such high-stakes strategies as a comprehensive freeway congestion pricing system, being that any changes to traffic patterns at a local level will create ripple effects across this interconnected region. A local consortium has the benefit of demanding greater attention and elevating political clout to enable members to raise issues of transportation and future mobility at the regional, state, and national levels. Demanding an elevated seat at the table at SCAG and the West-

side Cities Council of Governments will help to ensure that Culver City is not overlooked in studies of congestion pricing schemes or similar important initiatives in the future.

For programs and policies confined to Culver City, pilot programs are instrumental for demonstrating to community members the potential benefits of deterrence-based pricing schemes while minimizing their knee-jerk resistance to changes that are perceived to be abrupt and permanent. Pilot programs, such as with congestion pricing in Sweden, have demonstrated remarkable success in reshaping perceptions about public utilities (i.e., roads, parking) that have long been taken for granted as (practically) free. **Leveraging low-committal, temporary trial periods** to reconfigure the parking or driving experience, and for community members and neighbors to test the waters, can help build a constituency for pricing - one which is currently absent from our public forums.

While revenue generation certainly factored into our recommendation framework, it is important to not lose sight of the forest for the trees by reducing any of these recommendations to just their revenue potential. Evaluating their impacts on a holistic basis will allow public agencies to distill their benefits to the broader public in an accessible way while managing the community's expectations. It is often tempting to frame the pricing conversation in terms of its follow-on effects in the form of increased revenues, but **public messaging should refrain from emphasizing the financial impacts over the very real, tangible benefits to quality of life**, and in doing so, remain true to Culver City's core planning values.



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Conclusion

Over decades, we have gradually built Culver City, and the broader region, to cater to cars. However, cities face an impossible task in accommodating personal vehicles or peak-hour demand for driving while also providing critical infrastructure, services, and amenities that differentiate good cities from truly great ones. Straightforward policy fixes that shift priorities away from automobiles can produce more land for housing, better circulation (for cars as well), as well as improved air quality. Our recommendations seek to deliver these outcomes, but instead of relying on naive belief that driving behaviors can be radically altered by incremental progress, rather, they expose the true costs of driving--both for individuals and the City--to reduce its occurrence. Fundamental changes rooted in pricing strategies can alter daily decision-making about how we choose to move around, as well as reshape our cities by reimagining the allocation of public assets (streets and parking spaces) and regulation of private developments.

It is imperative that Culver City make necessary changes now, as burgeoning job growth will exhibit increasing pressure on the City's infrastructure and amenities. Our proposal for a Transportation Management Association is framed as low-hanging fruit - a light-weight and flexible solution to generate public interest in alternative modes and provide knowledge, experience, and resources for local employers, particularly smaller businesses. Parking management and road pricing, while we acknowledge to be steeper political hills to climb, comprise the core recommendations of this report. Parking management helps to reduce the supply of parking, clarifying once-hidden costs and enabling more efficient use of current spaces dedicated to parking. Similarly, road pricing manages travel demand and optimizes use of road space via dynamic tolling to keep traffic flowing. These two performance-based pricing strategies, while relatively simple exercises compared to the complex task of determining the appropriate parking requirements for each land use, are big asks of any local government. They will not be easy to achieve due to both political reasons and implementation challenges. While we briefly discuss strategies to overcome such hurdles, both require further studies and detailed implementation plans in order to be successful.

These strategies can transform Culver City into a leader for urban reform - a more inclusive home to more people, a vital economic hub with expanding room for growth, a place where alternative modes are ample, appealing, and practical, and where streets are efficiently utilized by all modes and community members. The first step towards achieving that vision requires that we forgo a long-held presumption of free roads and free parking, and reckon with the debts we have accrued as a result.

