MOBILITY GO ZONE & PRICING FEASIBILITY STUDY

FINAL REPORT

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DISCLAIMER

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TABLE OF CONTENTS

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Home to some of the worst traffic congestion in the nation with a population continuing its rapid expansion, the Los Angeles region can no longer rely on new roadways to reduce travel times. Innovative mobility choices through technologies are offering new possibilities, but a fundamental shift is needed to better enable the coordination and management of mobility.

The Southern California Association of Governments (SCAG) is the metropolitan planning organization (MPO) responsible for developing integrated land use, housing, employment, and transportation programs and strategies for the region to help improve air quality, mobility, and quality of life. Most recent projections in the Regional Transportation Plan/Sustainable Communities Strategies (RTP/SCS), the region's long-range plan, show population increasing from 18.3 to 22.1 million people by 2040, which will only exacerbate existing congestion levels as employment also grows from 7.4 to 9.9 million jobs[1].

As drive alone trips still comprise a large portion of regional travel (42% of all trips and nearly 76% of work trips versus only 14% carpooling to work[2]) , SCAG's RTP/SCS describes how growth can begin to be accommodated by coordinating transportation and land use strategies, enabling easier access to jobs, schools, services, and housing. Legislation, policies, and programs at all levels of government have begun to emphasize the reduction of vehicle miles traveled (VMT) and vehicle hours traveled (VHT) as key performance metrics.

This summary report provides an overview of the Mobility Go Zone & Pricing Feasibility Study, focused on addressing traffic hot spots with a range of tools and incubating what can work to relieve local congestion problems. This study explores how a Mobility Go Zone Program could be structured, with particular emphasis on the use of decongestion fees that can have sizeable impacts on VMT and VHT[3].

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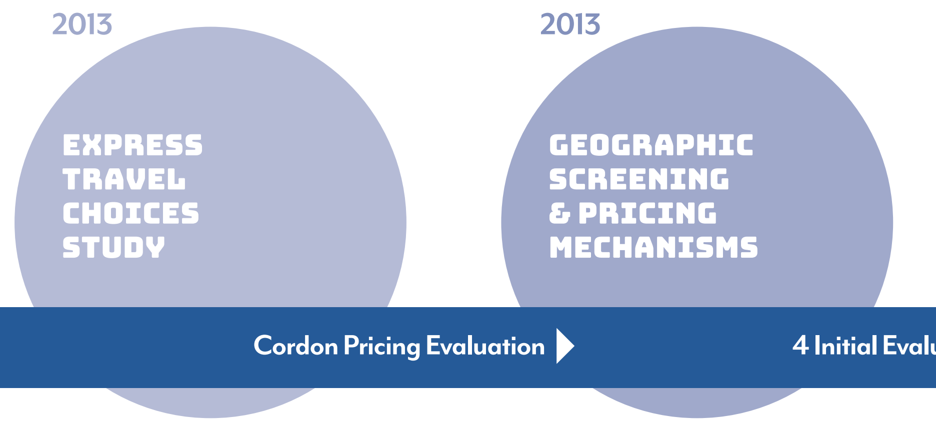
1 2016 SCAG RTP/SCS, Demographics and Growth Forecast
2 2016 SCAG RTP/SCS, Chapter 2
3 A decongestion fee, also referred to as congestion pricing, is a user fee assessed on vehicles traveling into congested areas during peak times.

PHASES OF THE MOBILITY GO ZONE & PRICING FEASIBILITY STUDY



There are a number of key objectives for development of a Mobility Go Zone Program in the Southern California region, and these include:

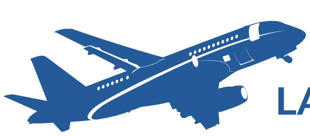
- Providing a viable demand management tool, proven effective in other regions around the world
- Providing a revenue source to fund mobility options such as "shared modes" (transit, carpooling, vanpooling, etc.) and "active transportation" (bicycle and pedestrian) infrastructure improvements to help commuters make alternative choices to driving alone
- Supporting sustainability goals by contributing to reductions in GHG emissions by reducing VMT and VHT
- Allowing for the use of policy measures and discounts to address equity concerns and promote mobility options for commuters of various income levels
- Providing economic and other valuable benefits, such as travel time savings and reliability, improved quality of life, new jobs and improved access to jobs

STUDY OVERVIEW

The Mobility Go Zone & Pricing Feasibility Study was funded through the Federal Highway Administration's (FHWA) Value Pricing Pilot Program grant to study the technical feasibility and impact of congestion pricing strategies. An initial phase of the study reviewed a wide range of congestion pricing options and their potential applicability to the SCAG region and recommended various pricing concepts for further analysis, including the potential for integrating cordon/area pricing within major activity centers. Cordon/area pricing involves charging a variable or fixed fee to drive into or within a highly congested area—the focus of this study.

This pricing strategy was analyzed through an iterative screening process within multiple areas of Los Angeles to determine a potential proof-of-concept pilot program to model and analyze in more detail. Technical refinements were made based on stakeholder input and initial travel demand modeling results to advance to a detailed evaluation of a potential pilot program, named the Mobility Go Zone Program. The figure above summarizes this process.

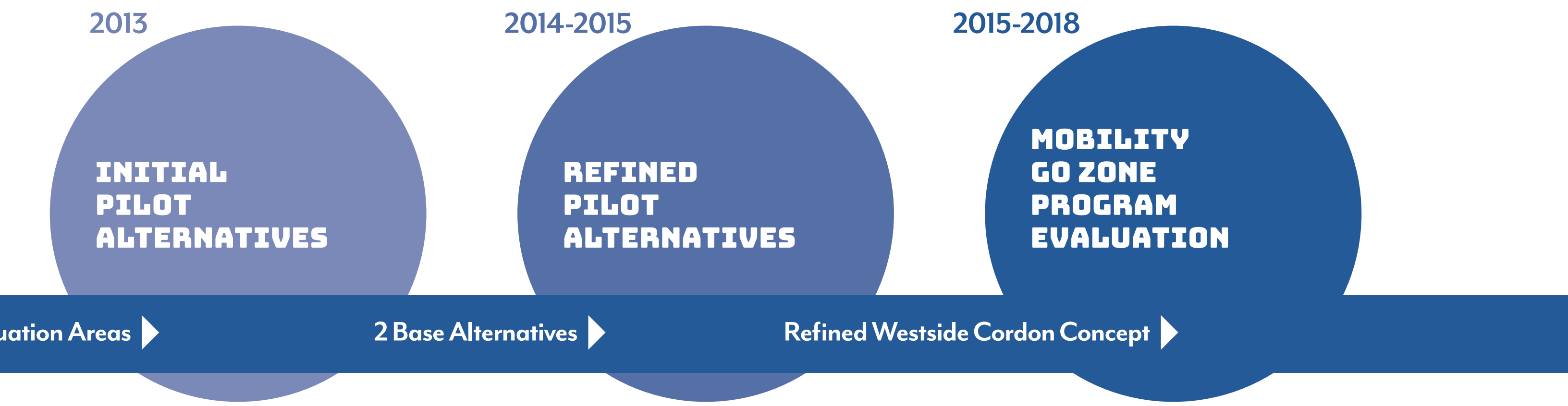
AREAS SCREENED



LAX

HOLLYWOOD

DOWNTOWN LA



SCREENING PROCESS

During the iterative screening process, several geographic areas perceived to have the highest levels of traffic congestion in Los Angeles County (and the SCAG region) were considered as candidates to assess a cordon/area pricing proof-of-concept. Factors including arterial congestion delay, overall technical feasibility, and potential support from the public and local governing agencies were considered to identify a specific location to evaluate the feasibility of a pilot program. Six broad geographic areas with multiple hot spot locations were screened down to four initial evaluation areas. Employment data and travel characteristics were collected for these four areas and then assessed to determine the list of initial pilot alternatives. A two-step screening process of initial pilot alternatives was conducted, which resulted in a more detailed analysis of two base alternatives (Westside and LA LIVE). The LA LIVE Alternative was not pursued for further project definition based on feedback from key stakeholders, but could be developed at a later time.

The Westside area located in the Cities of Los Angeles and Santa Monica was identified as a key proof-of-concept area due to its very high jobs-to-housing ratio and major employment centers that are served by two of the most congested highways in Southern California and an arterial network that routinely slows to five miles per hour. This congestion hinders overall mobility of travelers commuting to and within this area, specifically during AM and PM peak travel times to access the regional highway network with over a 35% travel time delay in the PM peak. Additionally, the area's changing land uses from industrial to media and tech industries as well as progressive stances on new transportation technologies are indicative of the appetite for innovation.

EVALUATION & REFINEMENT PHASE

Following the screening process and determination to study the feasibility of a pilot program on the Westside, refinements were made to the details based on stakeholder feedback and initial travel demand analyses from the screening process. The concept of a "Mobility Go Zone" was derived and defined as a geographic area with a suite of mobility service options for commuters, visitors, and residents to reduce dependency on personal automobiles. This expanded mobility ecosystem can include increased local bus circulator routes including micro-transit options, express commuter buses, bike share and enhanced active transportation infrastructure, enhanced pedestrian infrastructure, and incentive methods including a decongestion fee on vehicles entering during peak traffic periods (particularly for single-occupant trips) to encourage drivers to shift travel patterns to shared modes; shift less time sensitive or lower value trips to off-peak times resulting in more evenly distributed daily congestion. Revenues collected from the fee would be used to fund local transportation improvements to help reduce congestion and carbon emissions, and offer improved travel options for residents, commuters, and other visitors to the area.

The Mobility Go Zone Program was studied based on economic-financial operations, equity considerations, public and stakeholder outreach and market research of employers, commuters and visitors specific to the study area. During this evaluation phase, the Mobility Go Zone Program was further refined through the aid of a public outreach initiative including traditional meetings with stakeholders, focus groups, networking events, panels, and a social media campaign called 100 Hours. The 100 Hours public engagement campaign was the first of its kind led by SCAG to start a public conversation regarding decongestion fees and a Mobility Go Zone Program.

STUDY AREA


Sunset Blvd
405
Barrington Ave
LOS ANGELES
SANTA MONICA
Bundy Dr
Barrington Ave
Santa Monica Blvd
Olympic Blvd
405
10
10

MOBILITY GO ZONE PROGRAM BENEFITS

In this report, the impacts of the Mobility Go Zone Program were evaluated as it pertains to the Westside area as a proof-of-concept pilot location. The Westside area attracts travelers from a variety of origins due to the large employment centers and nearby activity centers including University of California, Los Angeles, St. John's Hospital, Santa Monica College, and the City of Santa Monica and nearby beaches. The majority of trips originate from nearby neighborhoods within five miles of the study area. Travelers also originate from the San Fernando Valley, Central Los Angeles and the South Bay communities. The Mobility Go Zone Program concept modeled significant benefits, which are described in the following section.

REDUCING TRAFFIC CONGESTION

Travel demand modeling efforts demonstrated potential for reductions in overall traffic congestion in the study area. The primary indicators of traffic congestion assessed are vehicle miles traveled (VMT) and vehicle hours traveled (VHT). A summary of findings for these indicators is described in the following.

VEHICLE MILES TRAVELED (VMT)

VMT is the measurement of cumulative miles driven of all vehicles within a specific location. Based on the feasibility analysis, the Mobility Go Zone Program would reduce VMT within its boundaries by over 22% during the AM peak period and almost 21% during the PM peak period. During off-peak periods, VMT is projected to increase slightly by 6%, which means that travelers would choose to travel at different times throughout the day, thereby reducing traffic congestion during peak periods and more evenly distributing trips throughout the day.

VEHICLE HOURS TRAVELED (VHT)

VHT measures the number of cumulative hours of all vehicles traveling within a specific location. Based on the feasibility analysis, the Mobility Go Zone Program would reduce VHT within its boundaries by nearly 24% in both the AM and PM peak periods. On an average day, a 9.6% reduction of VHT would occur as travelers shift their travel times from peak periods to less congested off-peak periods. A more even distribution of vehicles using the roadways in the study area throughout the day improves traffic conditions for all users. The Mobility Go Zone Program would experience fewer cars on the road during peak periods, enabling all users to move more efficiently and reliably on the roadway network throughout the day.

PEAK PERIOD

VMT REDUCED BY **21%**

VHT REDUCED BY **24%**

DAILY TRAVEL

8% DROP IN DAILY **VMT**

10% DROP IN DAILY **VHT**

SHIFT OF TRANSPORTATION MODE CHOICE

With the implementation of a Mobility Go Zone Program, travelers choosing to drive a car into the study area would decrease by 19% during peak periods, including a 22% reduction in single occupancy vehicles entering the area. Travelers choosing to take transit or bike/walk into the area would increase by 9% and 7% during peak periods, respectively.

ECONOMIC ASSESSMENT

The Mobility Go Zone Program is expected to improve mobility and the transportation-user experience. In practice, this means people will enjoy travel time savings to get to their respective work, leisure, school or other destinations.

The benefit-cost analysis shows that the Mobility Go Zone Program would result in a net value creation over the 16-year analysis period. Overall, the benefits amount to nearly $1 billion in present value terms over the analysis period. This estimate is derived from the benefits of travel time savings, vehicle operating cost savings, safety cost savings, and greenhouse gas/air pollution emission cost savings. After factoring in capital and operating costs of $326 million for associated fee collection infrastructure and transit improvements, the program would create economic value of $667 million in present value terms. The economic feasibility of the program can also be represented by the benefit/cost ratio of 3 to 1.

In addition, the annual operating needs and induced effects of additional spending in the local economy are expected to support nearly 500 jobs annually, and result in $54 million in output and $25 million in wages and salaries. Other economic development impacts can take the form of a higher standard of living for people who live or work in the area (e.g., wider range of job opportunities and/or a higher take-home pay) and productivity gains for businesses located in the area. Productivity gains would be achieved through more attractive street-level conditions which are more conducive to retail activity, business interaction and other commercial activities, and through lower operating costs resulting from the improved mobility. During the outreach process, there were concerns raised that the presence of a decongestion fee could negatively impact businesses within the zone; however, international case studies have shown that the London Congestion Charge, for example, did not result in any adverse impacts on businesses and economic activity in the aggregate[4].

4 Central London Congestion Charging: Impacts Monitoring." Transport for London. Sixth Annual Report, July 2008

FINANCIAL ASSESSMENT COSTS

The Mobility Go Zone Program capital costs include the cost of investing in tolling infrastructure and other enhancements to the existing transportation network. Operating and maintenance costs (O&M) of the program include the cost of maintaining the tolling equipment, cost of collecting the decongestion fee, and cost of operating and maintaining an expanded bus fleet. As modeled, total startup capital costs are estimated to be $41.9 million ($14.7 million for toll collection infrastructure and $27.2 million for transit capital). Operating and maintenance costs are estimated to be $41.3 million annually assuming the project was implemented in 2020. Though these costs would be incurred, the Mobility Go Zone Program would collect revenue in excess of the capital and O&M costs.

REVENUE

Revenues from the Mobility Go Zone Program would be generated primarily from decongestion fees; some additional transit revenue from increased service was assumed as well. The program includes discounts on the decongestion fee for residents of the Mobility Go Zone and low-income travelers from around the region. This is to mitigate any undue financial impacts such a program may have on both travelers and businesses. Reinvesting the revenue in services that aid low-income travelers is a crucial component of the program as well. The decongestion fee analyzed in this study across all types of travelers assumed a charge of $4.00 (or $3.29 average after low-income and resident discounts are applied) per vehicle entering the Mobility Go Zone during peak periods only. Decongestion fee revenues are estimated to be approximately $86.5 million in 2020 and $135.2 million in 2035. Additional transit revenues are also anticipated with enhanced transit service into and within the Mobility Go Zone. The additional fare revenue in 2020 is estimated to be nearly $1 million and $2 million in 2035.

CASH FLOW

Comparing the projected costs to projected revenues result in the net local cash flow. Net local cash flow is calculated by adding the local share of tolling infrastructure and transit costs to the operating balance, assuming some of the initial capital costs would be covered by either state or federal grants. The Mobility Go Zone Program is expected to generate an annual average of $69.2 million in net revenue over the first 16 years. These funds would be used to further enhance the transportation network and transit facilities, providing even greater benefits and improving connectivity to and within the Mobility Go Zone.

BENEFIT COST RATIO **$933M** BENEFITS ÷ **$326M** COSTS = **3:1**

ADDRESSING EQUITY CONCERNS

The design of a Mobility Go Zone Program would need to carefully consider policies to mitigate some of the increased financial burden on low-income groups including enhanced transportation alternatives for transit dependent populations. Within the study area, the median household income is roughly $80,000, but has a very large range. Approximately 18% of households within the Mobility Go Zone report household incomes of less than $25,000 and 8.2% of households do not have access to a private vehicle, including 3% of owner-occupied households and 10% of renter-occupied households in large part due to the student and elderly population residing in the area.

Low-income travelers to the area are much more likely to take transit or carpool than drive alone, compared to all-income travelers. Only 8% of all daily travel trips taken are by low-income individuals, but when looking at transit trips only, low-income travelers account for 23.6% of all daily trips. This increases to approximately 30% when only looking at transit commute trips, further showing low-income commuters reliance on transit. Of the number of people driving alone, only 2.2% are low-income. These travelers would directly benefit from investments in new transit service to and from areas currently underserved by transit, and by circulator routes serving travel within the Mobility Go Zone and surrounding areas.

As part of equity considerations, it should be noted that the recent SCAG/UCLA study, Falling Transit Ridership, concludes that transit ridership has been falling in Southern California primarily due to increasing auto ownership, particularly among those groups that are most likely to take transit. From 2000 to 2015, rates of auto ownership increased disproportionately among low income and foreign-born households that did not previously have access to a car. A Mobility Go Zone Program should therefore consider the impact of a fee on these households.

NEW TRANSPORTATION TECHNOLOGIES & GO ZONES

Transportation technologies have continued to change how Southern Californians travel around the region. Transportation network companies (TNCs) such as Uber and Lyft have affected how people travel both short and long distances. Especially in congested areas, travelers are increasingly likely to opt for a ridesharing service to drop them off at their preferred destination. Policies within the Mobility Go Zone should consider ridesharing services and the relationship between this type of transportation and a decongestion fee as these services continue to grow in popularity. Recent studies have shown that TNCs have actually increased VMT in major cities as TNC vehicles drive with no passengers between paid trips and approximately half (49% to 61%) of ride-hailing trips are ones that would have been made by walking, biking, transit or avoided all together, if the ride-haling application was not available[5]. Therefore, mitigation policies must be considered to encourage the use of transit, active transportation, or multiple passenger ride-sharing. This could consist of charging an hourly rate for TNC vehicles instead of a per-trip charge. Additional analysis should assess the impacts to traffic congestion should TNCs be subject to differential pricing as more information and data about this industry becomes available over time. Further, as technology in the transportation sector continues to rapidly evolve, additional research should consider how new technology platforms for mobility services can integrate road pricing options.

5 Clewlow, Regina and Gouri Mishra. "Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States." Institute of Transportation Studies, UC Davis. October 2017.

TRANSPORTATION MODE

SHIFT FOR INBOUND PEAK PERIOD TRIPS TO THE GO ZONE

9% TRANSIT

7% BIKING

7% WALKING

-19% DRIVING

SUMMARY

This feasibility study does not serve as the basis of an implementation decision. The intent is to provide background to public agencies interested in such a pilot program. The Mobility Go Zone & Pricing Feasibility Study identifies the following key benefits:

- Contributes to congestion reduction, resulting in a 19% reduction of automobiles entering the Mobility Go Zone during peak periods.
- Increases the use of transit and active transportation, resulting in an increased mode shift to transit (9%), walking (7%), and biking (7%).
- Incentivizes carpooling and higher occupancy vehicles as preliminary sensitivity analysis suggests that additional discount policies offering free passage to carpools of three or more passengers (CP3+) would result in a 51% increase in peak period trips of CP3+ vehicles.
- Contributes to improved quality of life by providing enhanced pedestrian infrastructure, local bus circulator routes, express commuter buses, bike share and other enhanced active transportation services to increase mobility options for commuters, visitors, and residents alike.
- Contributes to improved emissions by reducing VMT by 21% to 22% and VHT by 24% in the peak periods, in addition to the equivalent annual benefit of GHG emission reductions of $4 million.
- Provides a self-financing mobility program to offer additional funding sources with an annual average net revenue of $69.2 million to support transportation investments, pedestrian amenities, economic development, and offer additional revenue sources for local reinvestment.

1.0

BACKGROUND & INTRO

1.1 BACKGROUND OF STUDY

Every day, residents and workers in Southern California contend with some of the worst traffic congestion in the country. The delay and frustration resulting from congestion degrade residents' quality of life and act as a drag on the region's economy. The social and economic opportunities available to residents are restricted by the challenges associated with traveling to certain neighborhoods or areas or at certain times of the day. Southern California residents are acutely aware of the impact traffic congestion has on their lives: traffic congestion was found to be Los Angeles County residents' top concern, even greater than crime/safety and personal finances, according to a September 2015 Los Angeles Times poll[1] and residents have demonstrated a willingness to reach into their pocketbooks for solutions. Since 1980, voters in Los Angeles, Orange, Riverside, and San Bernardino counties have all approved transportation sales tax measures to fund transit, roadway, and active transportation improvements in hopes of alleviating traffic congestion.

INRIX, a transportation analytics firm, releases an annual Traffic Scorecard that analyzes and ranks the traffic congestion impacts in cities across the world. The 2017 scorecard showed that commuters in the Los Angeles-Long Beach-Anaheim metropolitan statistical area lose an average of 102 hours to traffic per year—worst in the world. The 2018 scorecard reports 128 hours lost to traffic.[2] Conditions are only expected to worsen as the region grows to 22.1 million residents by 2040. Additionally, vehicular demand continues to increase due to the improved economy and low fuel prices, despite numerous local and regional sustainable policies being implemented.

In the past decade, most policy makers have concluded that improving level of service (LOS) by adding roadway capacity is not the solution to improving traffic congestion. Recently, efforts have shifted towards improving overall mobility, rather than increasing system capacity to handle overall demand for travel. This approach has led to legislation aimed at reducing vehicle miles traveled (VMT) and vehicle hours traveled (VHT) by encouraging alternative types of land uses and modes of transportation. Reductions in VMT and VHT result in less traffic congestion and smoother flowing roadways for all mode types. Additionally, California passed the Sustainable Communities and Climate Protection Act (SB 375) that required a reduction of greenhouse gas (GHG) emissions from passenger vehicles and light trucks. SB 375 requires regional planning organizations, such as the Southern California Association of Governments (SCAG) to prepare a Sustainable Communities Strategy (SCS) in coordination with the Regional Transportation Plan (RTP) every four years to coordinate land use and transportation planning between regional, state, and local government agencies. The RTP/SCS developed by SCAG and its transportation partners seeks to achieve these emission targets by providing incentives for higher density, mixed-use developments that support more sustainable transportation choices. However, changes in land-use alone will not be enough to achieve the emission reduction targets of 8% per capita by 2020 and 19% per capita by 2035 (relative to 2005 base levels) set for the 2020 RTP/SCS. SB 375 builds on previous congestion management efforts but focuses on methods of regional congestion management other than adding vehicle-lane capacity. Tools under SB 375 include local transportation demand management requirements and parking cash-out incentives to reduce the number of vehicles needed every day.

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1 "Traffic still tops crime, economy as top L.A. concern, poll finds." Los Angeles Times, October 8, 2015.
2 http://inrix.com/scorecard/

Figure 1-1 **OLYMPIC BLVD APPROACHING I-405**

1.2 INTRODUCTION

Transportation and planning agencies in the region have begun to utilize pricing tools as one way to manage demand and reduce congestion. Beginning in 2012, the Los Angeles County Metropolitan Transportation Authority (Metro) implemented express lanes on Interstates 10 and 110, to provide new options to travel around the region. Additionally, the Los Angeles Department of Transportation (LADOT) has been operating the LA Express Park program since 2012 in Downtown Los Angeles, using dynamic metered parking prices to manage the on-street parking supply more effectively, while creating more parking turnover to increase economic activity in the area.

In 2013, SCAG conducted the Express Travel Choices Study, which reviewed a variety of congestion pricing options and their potential applicability to the SCAG region based on mobility, economic and equity impacts. The study identified cordon/area pricing as a promising tool for traffic hot spots, but additional analysis was required to identify the most promising geographic area and system design for initial testing. Cordon/area pricing involves charging a variable or fixed fee to drive into or within a highly congested area—the focus of this study.

For this current feasibility study, a set of goals and objectives was developed to guide the evaluation of alternatives. These goals included reducing congestion and its associated environmental consequences; producing positive financial and economic outcomes, including quality of life outcomes; and being feasible to implement. A preliminary set of alternatives incorporating a variety of geographic areas throughout Los Angeles and a range of pricing mechanisms that had the potential to meet the described set of goals and objectives was identified. These areas and pricing mechanisms were refined through a process that included a series of sequential screenings and feedback from agency and elected stakeholders, as well as members of the public. The alternatives with the highest potential to achieve the goals and objectives were subjected to a detailed evaluation of benefits and impacts, which resulted in a recommendation of the Westside area as a promising proof-of-concept location.

The Westside area, located in the Cities of Los Angeles and Santa Monica, has very high jobs-to-housing ratio, multiple major employment centers served by two of the most congested highways in Southern California, and an appetite for pioneering change and innovative technologies. Within the Los Angeles metropolitan area, the Westside area of Los Angeles experiences some of the most severe traffic congestion daily with speeds on major arterials as low as 5 miles per hour (mph) during the PM peak period approaching regional highways. The Texas Transportation Institute found that the Interstate (I-)

Figure 1-2

I-10 OFF-RAMP AT CLOVERFIELD BLVD

405 northbound and I-10 eastbound in West Los Angeles to be the third and sixth most congested highway corridors in the nation, respectively, in terms of delay per mile.[3] As a result, traffic at the interstate on- and off-ramps back up daily onto the arterial roadways for up to a mile across all lanes, restricting through traffic as illustrated in Figure 1-1 and Figure 1-2.

Perhaps due to persistent daily traffic congestion, the Westside is one of the most aggressive areas in the region in its encouragement of alternative transportation modes through several local planning efforts, including the Santa Monica Land Use and Circulation Element (LUCE), Bergamot Area Plan, City of Los Angeles' Mobility Plan 2035, Exposition Corridor Transit Neighborhood Plan, and Westside Mobility Plan. While the focus on planning for a multi-modal transportation system demonstrates that some Angelenos want to change how they interact with their streets and are looking for alternatives to driving a car, the plans have also been controversial. Many view these plans for redesigned streets as reallocating automobile lanes to other modes and fear an increase in automobile congestion. To reduce congestion, while allowing those drivers who want to continue driving to do so, an effective solution is to provide attractive mobility alternatives to driving (i.e., commuter buses, local circulator buses, dedicated transit lanes, bike share, and enhanced pedestrian infrastructure). While the provision of alternatives is critical, all of these mobility options, including driving, must be priced appropriately for the system to function effectively. For example, using incentives to shift discretionary vehicle trips away from peak times or low-occupancy modes can produce large congestion relief benefits.

3 TTI's 2011 Congested Corridors Report. Texas Transportation Institute, November 2011.

Technology has aided the availability of widespread transportation information and the implementation of previously envisioned but impractical transportation ideas (e.g., open-road tolling, parking payments via web, real-time navigation that reacts to traffic). In particular, smart phones allow for the implementation of flexible pay-per-use systems and provide real-time information to enable the opportunity for a shift in the way people think about their travel choices.

The current feasibility study explored many aspects of cordon/area pricing including economic-financial operations; equity considerations; community and stakeholder outreach; and market research focused on employers, commuters and visitors specific to the mobility considerations of the Westside area.

This report describes the analysis findings and further defines in detail the cordon pricing strategy as a comprehensive "Mobility Go Zone" Program. A "Mobility Go Zone" Program is a geographically defined area that has a suite of mobility options for commuters, visitors, and residents to encourage reduced dependency on personal automobiles. This can include increased local bus circulator routes, express commuter buses, bike share and other active transportation infrastructure, enhanced pedestrian infrastructure, implementation of decongestion fees on vehicles entering during peak traffic periods, [4] and other incentive methods to make using transit, active transportation, or higher occupancy modes more attractive options for regular use. The Mobility Go Zone concept presents a number of benefits that could be tailored to other possible locations throughout Los Angeles County (and the greater SCAG region).

4 A decongestion fee, also known as congestion pricing, is a mobility management tool involving user fees for vehicles traveling into congested areas during peak times.

1.3 MOBILITY GO ZONE PROGRAM

As envisioned, the program would include enhanced active transportation projects and programs. New sidewalks and sidewalk repairs would be provided, as well as pedestrian crossing improvements and pothole repair. New bicycle facilities would be provided, and bike share programs could be funded on an ongoing basis. Transportation systems management improvements, including signal timing optimization and adding left-turn arrows, could be implemented as further complementary measures. Additionally, more innovative transportation initiatives and amenities could be considered to respond to the growing on-demand transportation market, including for example, providing on-demand micro-transit service options where local circulators may not be feasible.

The study area has had significant transportation and associated land use investments over the past decade, including the Metro Expo Line opening in 2016 and housing and office space development spurred by transit investment. Residents, employees, and visitors alike have seen new transportation options develop, spurred by both the public and private sectors (i.e., transportation network companies, Breeze bike share, and dockless scooters and bikes), further highlighting the area's experimentation with innovative transportation solutions.

The study area is shown in Figure 1-3 and is generally bounded by Montana Avenue and Sunset Boulevard on the north, I-405 on the east, I-10 on the south, and 20th Street on the west. These boundaries could be expanded or condensed in future analysis and outreach.

For the analyzed proof-of-concept program, vehicles crossing into the designated boundaries would be charged a decongestion fee during the AM and PM peak periods for in-bound traffic only. Trips originating within the designated area would not be charged, regardless of whether they terminate inside or outside the program area boundaries. The decongestion fee tested for this feasibility study was approximately $4 per vehicle entering the area during enforced charging time periods correlated to periods of peak congestion. As envisioned, discounts would be available for low-income commuters and residents living within the Mobility Go Zone Program boundaries. Further, payment options would be integrated with California's FasTrak® program through the shared use of FasTrak® transponders, but automatic license plate recognition (ALPR) would be available for those vehicles without FasTrak® transponders.

The fees collected from vehicles entering the designated charging area boundaries are expected to raise funds that exceed the capital, operations, and maintenance costs associated with implementing the proposed program. The project would operate as a self-financing mobility improvement program, in which net revenues are used to enhance mobility options to and within the area, including extensive investment in transit services to and within the program area. The capital and operating costs of the transit services would be paid for from program revenues. It is envisioned that the services would include local circulators to facilitate short trips within the area and connect to Metro Expo Line stations, long-distance commuter bus services from areas such as the San Fernando Valley and the South Bay, and increased service on existing bus routes serving the Mobility Go Zone Program area.

1.4 ORGANIZATION OF REPORT

This report describes the background of the study, development, high level conceptual design, financial plan, costs, and benefits of the Mobility Go Zone Program. Chapter 2 discusses how congestion pricing has been used as a transportation demand management (TDM) tool in similar case studies around the world, and how it relates to planning efforts. Chapter 3 summarizes the development of the program to describe how the Westside study area was ultimately screened for modeling a potential pilot program. Chapter 4 describes the details of the Mobility Go Zone Program including travel demand, economic, and equity analyses. Chapter 5 provides a detailed financial analysis of costs and revenues for a pilot program.

Figure 1-3 **MOBILITY GO ZONE PROGRAM PROPOSED BOUNDARIES**

2.0

CONGESTION PRICING AS TDM STRATEGY

2.1 PRICING AS A TOOL TO IMPROVE MOBILITY

Historically, pricing of transportation facilities in the region has been used primarily to generate revenue for the operator of the facility to cover the costs of construction and/or ongoing operations. More recently, pricing has been implemented as a demand management tool. Pricing a transportation facility can make users more aware of the direct and indirect costs of their travel choices and encourage a change in travel behavior. Creating a more balanced transportation network through pricing can lead to improved mobility for all users.

Recent technological advancements related to fee collection have allowed for increasingly more sophisticated pricing strategies. Pricing strategies in the SCAG region began with the State Route (SR) 91 Express Lanes that employ variable time-of-day pricing along a single corridor so that paying customers can utilize the facility at a high level of service. Recent pricing tools in Los Angeles transportation enabled by technology are the Metro ExpressLanes, which employ dynamic pricing using FasTrak® transponders, and LA Express Park, which sets parking prices based on demand.

Pricing is an effective demand management tool because travelers will generally search for the quickest, cheapest, and most direct route to get to their destination. As traffic increases along preferred routes, travel time generally increases and makes those routes less desirable. Travelers will then alter their mode and/or take alternative routes that might be longer in distance. As these alternative routes become more utilized and thereby congested, they will lose their advantage over the preferred route. If improvements are made to the alternate routes, then travel times will be quickest on the new routes, until other travelers recognize this and shift their travel patterns to utilize the improved routes. Eventually, the improved routes will also become congested and provide no benefit compared to the original route. Transportation economist Anthony Downs calls this result "triple convergence" due to the (1) spatial convergence of drivers switching their routes to other roadways; (2) time convergence of drivers altering their time-of-day travel; and (3) modal convergence of travelers switching between driving and transit depending on the faster alternative.[5] Congestion pricing can address this triple convergence by managing demand so that the relative advantages of the preferred and alternative routes remain consistent. Pricing also makes users more conscious of all the potential impacts that their travel choices may have on the entire transportation network.

Congestion pricing has been implemented on express lanes and some toll roads and bridges use variable pricing, but to date, a cordon charge has not been implemented within the United States. However, there are international examples of cordon and similar pricing strategies that have been successful for numerous years.

5 Downs, Anthony (1992). Stuck in Traffic, p. 27-29

2.2 CONGESTION CHARGING CASE STUDIES

In the previous decade, there have been an increasing number of successful transportation facility pricing projects throughout the world. The most common congestion pricing tool is a cordon or area charges that charge vehicles within a defined geographic boundary. All of the congestion charges are intended to reduce vehicle traffic and encourage the use of alternative modes or changes in time of travel. The following section discusses successful international case studies in London, Stockholm, and Milan, but other charging strategies have been implemented in Singapore, Gothenburg, and Trondheim.

LONDON CONGESTION CHARGE

In February 2003, the Congestion Charge scheme was implemented in Central London as a response to traffic congestion. It is one of the most well-known congestion charging programs in the world. The project introduced a cordon zone encompassing the central business district of London that charged a daily fee for vehicles traveling into the designated boundaries between 7 AM and 6 PM on weekdays. Vehicles are granted unlimited entries per day once the daily fee of £11.50 (approximately $15 USD) has been paid. Residents that live within the charging zone receive a 90% discount on the toll but no assistance is given to low-income travelers. Additionally, monthly and annual passes can be purchased at a 15% discount. The Congestion Charge brought in total tax revenue of $360 million, and after accounting for operating expenses, resulted in net revenues of $178 million USD in fiscal year 2007/2008.11

The program has multiple goals and is evaluated on an annual basis. According to the Transport for London (TfL), these goals include the following: (1) reduce congestion; (2) make significant improvements to bus services; (3) improve travel time reliability for car users; and, (4) make the distribution of goods and services more efficient.[6] Throughout its duration, the London Congestion Charging program has seen beneficial outcomes, highlighted by a 20% decline in automobile traffic during the first few months of implementation; initial traffic volumes decreased as travelers altered their travel patterns and switched to alternative modes in order to avoid paying the fee. Congestion levels have since risen to near pre-charging levels, but overall the effectiveness of the congestion charge has been considered a success by the TfL as conditions would have been much worse without the scheme in place.[7] The congestion charge did not result in any adverse impacts on business and economic activity at the aggregate.[8] Public support for the congestion charge steadily increased from 50% before implementation to 66% shortly after implementation to 71% a few years following implementing the program.[9] As users became more accustomed to the congestion charge and altered their modes of travel, the benefits and additional revenue to London have resulted in additional public support. In addition, taxi travel costs declined by almost 40% and vehicles were able to cover more miles per hour than before implementation.[10]

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6 "Central London Congestion Charging Impacts Monitoring, Sixth Annual Report." Transport for London (TfL), July 2008
7 "Public and Stakeholder Consultation on a Variation Order to Modify the Congestion Charging Scheme Impact Assessment." Transport for London (TfL), January 2014.
8 "Central London Congestion Charging Impacts Monitoring, Sixth Annual Report." Transport for London (TfL), July 2008
9 Eliasson, Jonas. "How to Solve Traffic Jams." TEDxHelvetia, September 2012.
10 "London Congestion Pricing: Implications for Other Cities", Victoria Transport Policy Institute, November 2011

STOCKHOLM CONGESTION CHARGE

The Stockholm Congestion Charge is a pricing system implemented as a fee levied on vehicles entering and exiting central Stockholm. It was implemented on a permanent basis on August 1, 2007, following a seven month trial period (January to July 2006) and successful referendum decision in late 2006. The Stockholm Trial consisted of three parts: expanded public transport network, congestion charge, and additional park-and-ride sites in the central city and in the rest of the Stockholm County. Charges are in effect from 6:30 AM to 6:30 PM every day, but are off on weekends, holidays, and during the month of July. Throughout the day the charges vary depending on what time of the day cars enter or exit the designated charging area. The highest charges are enforced during peak traffic hours in the early morning and late afternoon at 35 krona (approximately $4.25 USD). Beyond peak hours, charges can range from 11–25 krona depending on the time of day.[11] As of the drafting of this report, Stockholm does not include discounts for its charging program or exemptions for certain cars (e.g., multiple occupancy or low-emission vehicles).

The congestion charging perimeter has eighteen entry points along the main bottlenecks. The charge is assessed on a per-entry fee for every time a vehicle enters the designated area. Overall the charge has generated approximately $94 million USD per year.[12] Goals of the Stockholm congestion charging program are focused on reducing congestion and vehicle emissions in the inner city, rather than regional reduction goals. The effects of the implementation of the program generated numerous positive effects on traffic volume, congestion, and emissions. In its first year of operation during the trial period in 2006, the number of vehicles crossing into the congestion pricing zone fell by 22% compared to 2005. In 2008, the reduction in traffic crossing the boundaries was 18% compared with 2005. Emissions of CO2 from motor vehicles in the zone fell by 14% to 18% during the 2006 trial, with an additional 4% reduction in the year following permanent implementation. Travelers have shifted to alternative modes, with a 7% increase in public transportation journeys crossing the congestion tax zone.[13]

The project generated significant revenue for the area. Since implementation, operating costs have come in at well under 50% of revenues and cost-benefit analyses have shown that the program generates benefits that outstrip capital and operating costs by a factor of more than 4:1. The revenue stream has been able to fund a new commuter-train tunnel under the inner city, new train lines, and a new Bypass and Northern Link roads. Similar to the London Congestion Charge Scheme, public support for this project has increased as time has passed from pre-implementation to a few years following implementation.

MILAN AREA C

Milan's Area C congestion charge replaced the previously implemented ECOpass (2008), a program that focused on environmental pollution in the city by charging vehicles entering the city center between 7:30 AM and 7:30 PM on weekdays based on emissions. When Area C came into effect in January 2012, it began charging all vehicles regardless of the pollution they produced. Cars are charged anywhere from 2 to 5 Euros (approximately $2.30 to $5.80 USD), similar to the previously implemented program. Residents living within the charging zone are given 40 free entries per year and given a discounted rate of 2 Euros per entry after that; no assistance to low income travelers is provided. There are 43 entry points, including 7 for exclusive use of public transportation. Electric vehicles, motorcycles, scooters, public utility vehicles, emergency responders, buses and taxis are exempt from the charge. Hybrid and bio-fuel natural gas vehicles were exempt until the end of 2016, but now must pay the toll.

Area C started as a pilot program, running for 18 months before being approved as a permanent program in 2013. The objective of the program was to reduce traffic in the city of Milan, to promote sustainable mobility and public transportation, and to reduce emissions. Net revenues obtained from the Area C congestion charge are invested to promote sustainable mobility and policies to reduce air pollution, including investments in public transportation. Within the first three years of Area C operating, traffic was reduced by 30% in the charging zone, the number of car accidents dropped by nearly 24%, transit usage increased by 12%, and parking occupancy decreased by 10%.[14]

As of 2015, the program brings in approximately $28 million USD in revenue each year.[15] The program was halted for two months in the summer of 2012, in which traffic reverted back to pre-implementation levels nearly overnight. Once the charge was reinstated in September 2012, traffic decreased immediately once again.

11 "Swedish Transport Agency" https://www.transportstyrelsen.se/globalassets/global/vag/trangselskatt/congestion-tax-a4.pdf

12 "Introduction to Congestion Charging: A Guide for Practitioners in Developing Cities, 2015

13 Facts and Results from the Stockholm Trials, December 2008, Stockholmsforsoket

14 "The Experience of Milan AreaC: LEZ Workshop Mexico", December 2014

15 "Introduction to Congestion Charging: A Guide for Practitioners in Developing Cities, 2015

LOS ANGELES COUNTY I-10 AND I-110 METRO EXPRESSLANES

The Metro ExpressLanes on I-10 and I-110, are carpool lanes converted to express (or HOT) lanes. Solo drivers can choose to pay a fee to access the express lanes, while carpoolers can continue to use the express lanes for free as long as they have a registered FasTrak® Transponder and sufficient passengers in their vehicle. The program began as a demonstration project in November 2012 and after initial positive feedback, the express lanes were implemented on a full-time basis. Improvements to the express bus Metro Silver Line were included in this project as this route utilizes the express lanes along I-10 and I-110. The program offers the following discounts for those who use the Metro ExpressLanes:

- $25 waiver for transponders for low-income individuals
- Frequent riders are given a $5 credit for taking 16 one-way trips during peak hours
- AAA member 20% discount
- Friends and Family Referral Program ($10 of toll credits)
- Costco and Albertsons discount (10% off transponder discount)[16]

The effects of the program implementation resulted in decreased travel times in the AM peak on I-10 and improved travel times on the Metro Silver Line along the I-110 corridor. Metro Silver Line ridership also increased as a result of improved travel times. The implementation of the express lanes also helped surpass the goal of 100 new vanpools by spring 2014.[17] The program generated $34 million USD in revenue during its pilot period between November 2012 and February 2014.

16 Metro ExpressLanes website, https://www.metroexpresslanes.net/en/home/index.shtml, accessed March 2017

17 "Future of Metro ExpressLanes", Metro Board Meeting, April 2014

2.3 ALIGNING WITH PLANNING EFFORTS & DOCUMENTS

Numerous planning documents have been adopted at all levels of government recognizing congestion pricing as a tool that can make best use of existing and future investments in transportation infrastructure. The efforts taken throughout the development of this program were derived from and consistent with local, regional, and international planning efforts.

At the city-level, congestion pricing is aligned with City of LA goals and Mobility Plan 2035, which aim to increase safety, improve access, create world class infrastructure, and create clean environments and healthy communities. The Mobility 2035 study was developed by the Los Angeles Department of City Planning to update the Los Angeles General Plan Mobility Element, providing a road map to achieve a balanced transportation system. It acknowledges congestion pricing as a potential leveraging opportunity to implement Mobility 2035 and fund transportation-related projects. The City of Santa Monica's Land Use and Circulation Element (LUCE) aims to address congestion issues through combining travel demand management (TDM) efforts with station area planning by concentrating new and redevelopment at and around Metro's Expo Line stations.

More locally, the Bergamot Area Plan was developed by the City of Santa Monica to guide future planning and development around a major employment hub, leveraging the Expo Line to reduce the number of vehicles needed to reach this destination area. The Bergamot area includes a portion of the study area discussed in this report. Similarly, Los Angeles' Transit Neighborhood Plans guide planning efforts in the areas surrounding new Metro Expo Line transit stations in support of efficient multi-modal connections.

For West Los Angeles, the Westside Mobility Plan collected community input to create a blueprint for multimodal travel, including north-south rail connections, parking solutions, and "livable boulevards." The Mobility Plan strives to be a catalyst for future action in West Los Angeles by providing a range of transportation alternatives for daily travelers.

At the state and municipal planning levels, Senate Bill (SB) 375 directs the California Air Resources Board (CARB) to set regional targets for reducing GHG emissions. California's Assembly Bill 32 (AB) 32 set those targets for reducing GHG emissions to 1990 levels by 2020, 40% below 1990 levels by 2030, and 80% below 1990 levels by 2050. SCAG's 2016 Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS) demonstrates how the SCAG region will meet the GHG emissions targets set by CARB for year 2020 and 2035. This study is included in the list of Strategic Projects (2016 RTP/SCS Table 4, page 387). Caltrans adopted the California Transportation Plan 2040 in 2016 that sets a path to achieve climate goals through mode shift, transportation alternatives, congestion pricing, and operational efficiencies.

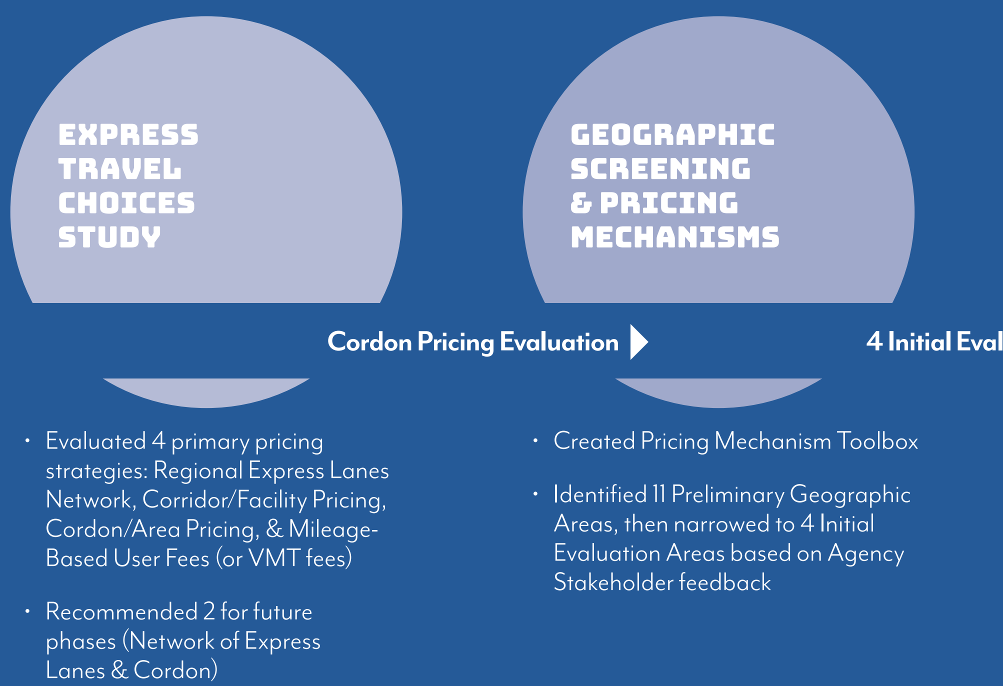
Internationally, C40 Cities is a network of the world's mega-cities committed to addressing climate change and driving urban action to reduce GHG emissions and climate risks while enhancing the health, well-being and economic opportunities of their residents. Deadline 2020 is a report produced by C40 to outline solutions to uphold the Paris Agreement to keep global average temperatures at bay. As a member of the C40 Cities network, Los Angeles has committed to consider alternative strategies to reduce GHG emissions, which includes a focus on TDM and congestion pricing.

3.0

STUDY DEVELOPMENT PROCESS

This feasibility study was federally funded through the Value Pricing Pilot Program (VPPP) and builds on the earlier phase of the Express Travel Choices Study which explored various pricing mechanisms and evaluated each strategy based on ability to reduce congestion, improve air quality, reduce greenhouse gases, and generate a sustainable source of revenue for transportation improvements. This chapter describes the iterative screening and development processes used to determine a potential Mobility Go Zone Program, including the assessment of various candidate locations around Los Angeles. A summary of the study process is shown in Figure 3-1.

Figure 3-1 **PROGRAM DEVELOPMENT PROCESS DIAGRAM**



3.1 EXPRESS TRAVEL CHOICES STUDY

SCAG undertook an initial study to address several congestion pricing approaches. This effort was called the Express Travel Choices Study and reviewed a wide variety of congestion pricing options and their potential applicability to the SCAG region. The study evaluated multiple pricing options and conducted a preliminary evaluation of them based on their mobility, economic, and equity impacts, and how they could be implemented. Four pricing mechanisms were found to be the most promising: a regional network of express lanes, cordon/area pricing, facility/corridor tolling, and mileage-based user fees. These four primary strategies were used to develop a set of congestion pricing scenarios that formed the basis for a more detailed technical analysis. These scenarios included variations of the four primary pricing strategies, as well as combinations of multiple pricing strategies to maximize benefits.

The Express Travel Choices Study included an analysis of how the most promising pricing options would help the region meet three primary objects to (1) reduce congestion; (2) improve air quality and reduce GHG emissions; and (3) create sustainable sources of revenue for transportation investments. Each scenario demonstrated improvements over the baseline scenario. The study also considered how the potential synergies among the strategies would improve the regional economy by increasing employment and enhancing regional economic competitiveness. A set of six of the initial scenarios were shortlisted for further evaluation using the following criteria: (1) mobility/congestion relief, (2) equity/environmental justice, (3) economic impacts, (4) air quality, (5) technologies and system design, (6) cost estimates, and (7) financial evaluation. Based on the results of that study, SCAG continued to evaluate two of the strategies in further detail: a regional express lane network and cordon/area pricing.

INITIAL PILOT ALTERNATIVES

uation Areas ▶

- Resident, employment, and travel characteristics identified for the 4 Initial Evaluation Areas
- Created 11 Initial Alternatives by assigning applicable pricing mechanisms to the Initial Evaluation Areas
- Conducted two-stage screening to determine 2 Base Alternatives for detailed analysis

2 Base Alternatives ▶

REFINED PILOT ALTERNATIVES

- Defined program details and conducted detailed analysis for the 2 Base Alternatives (Westside Cordon and LA LIVE Parking Surcharge)
- Eliminated LA LIVE Alternative
- Refined Westside Alternative based on Stakeholder input

Refined Westside Cordon Concept ▶

MOBILITY GO ZONE PROGRAM EVALUATION

- Designed conceptual operations and conducted detailed evaluation of travel demand, economic, financial, and equity impacts
- Launched public outreach campaign (100 Hours)
- Met with key Westside Stakeholders and Agency staff to begin identifying a lead agency

3.2 SCREENING PROCESS

Focusing on the cordon/area pricing mechanism identified in the initial phase of the Express Travel Choices Study, a preliminary set of pricing tools and geographic areas for consideration were identified. The regional express lane network was analyzed separately in a companion SCAG Regional Express Lanes Concept of Operations and is not discussed within this report. Based on case studies of congestion management practices used around the world, a "toolbox" of pricing mechanisms was developed. This phase of work consisted of evaluating and screening geographic areas and pricing mechanism in each of the areas to determine a potential proof-of-concept pilot program to model and analyze in more detail. This section summarizes the screening process, development, and conceptual analysis of how various pricing mechanisms could affect areas around the SCAG region.

PRICING TOOLBOX

This section reviews various pricing tools used around the world that can be applied to arterial roadways. Each can be used to help alleviate localized congestion, but specific pricing mechanisms encourage different combination of user behavioral responses including shifting travel patterns or times of day, encouraging additional transit use, reducing VMT, reducing GHG, and/or generating revenue. The toolbox presented in Table 3-1 includes both roadway and parking pricing tools to cover the range of desired outcomes. Parking pricing tools are included because parking costs can be a significant component of the total end-to-end cost of a trip, especially in business districts, and can affect mode and time-of-day choices for travel. Therefore, a parking charge imposed in a geographic area can act like an area charge. These tools are later applied to various geographic areas around greater Los Angeles and evaluated throughout the iterative screening process.

PRELIMINARY GEOGRAPHIC AREAS

The first evaluation step was to identify and assess eleven geographic areas as to their suitability for implementation of a pricing tool. Based on findings from the initial phase of the Express Travel Choices Study, the preliminary geographic areas considered were limited to Los Angeles County with a primary focus on the City of Los Angeles and immediately adjacent areas generally perceived to experience high levels of congestion during at least part of a typical week. Adjacent areas were also considered because land uses and associated congestion cross jurisdictional boundaries, so implementing a pricing policy in only one jurisdiction would be impractical.

A key criterion for inclusion in this preliminary list of geographic areas involved experiencing congestion on arterial roadways, as opposed to highways. The pricing tools evaluated in the study were generally suited to address congestion caused by a high level of demand for trips to and from a defined geographic area. The companion SCAG Regional Express Lanes Concept of Operations focused on evaluating pricing alternatives for the region's highways.

Figure 3-2 illustrates the preliminary geographic area boundaries and Table 3-2 summarizes the areas and recommendations for further evaluation. In all cases, the boundaries were intended to provide a general indication of the area under consideration with expected revisions and refinements as the study moved forward. These eleven geographic areas were identified because they are widely perceived to experience high levels of congestion during at least part of a typical week. These were then compared to the list of objectives for an initial broad analysis of the geographic regions to determine the initial evaluation areas.

The first three areas listed in the table are in Downtown Los Angeles with increasingly narrow boundaries. The broadest Downtown LA region was not included for further evaluation due to insufficient trips ending east of Alameda Street. The narrower Downtown LA and LA LIVE areas were carried forward.

The Westside areas showed the most potential for a pricing mechanism to be implemented as an initial trial, and parts of all three West LA geographic areas were recommended for further study. A large employment base exists in West LA and Santa Monica, and a relatively

Table 3-1 **PRICING MEC**

PRICING MECHANISM
Cordon Pricing
Area Pricing
Variable (Public) Parking Pricing
Parking Sales Tax
Parking Levy
Ticket Surcharge

large share of the employment is in industries requiring highly skilled workers, which would benefit from improved access to the regional labor pool. It was determined that the area west of I-405 would be most suitable; the biggest trip attractor east of I-405 is Century City where there is less internal roadway congestion as inbound traffic is largely limited to two major roadway approaches. Therefore, it was recommended to include the parts of these geographic areas focused on employment cores with internal congestion. The Westside area was selected for more detailed evaluation and further refinement, as discussed in the following subsection.

Revised Westside Alternatives

Technical refinements were conducted in coordination with agency and stakeholder engagement which informed the adjustments to the West LA scenarios. The preliminary list of areas included three options in West Los Angeles, but due to the polycentric nature of West LA (which is emblematic of the polycentric nature of the region as a whole), none of the initially proposed alternatives captured an appropriate concentration of trip attractions. Through the process of developing evaluation criteria, the study team began to focus on areas that: attract a large number of workers in a concentrated area, have highly skilled workers (and therefore benefit from access to a large labor pool), have jobs located near transit, and where congestion contributes to both local and regional livability and economic issues.

The study team met with City of Santa Monica Planning staff, who identified the jobs-rich area near Cloverfield Avenue north of I-10 as the area within their city that suffers the greatest arterial congestion. This area has a high number of professional jobs, including high-tech and new media, and the Bergamot Area Plan (as well as the City of Santa Monica's General Plan) seeks to limit automobile trips to the area. The Bergamot area in Santa Monica is adjacent to a high-employment area and located near two Metro Expo Line stations.

CHANISM TOOLBOX

DESCRIPTION
In a cordon pricing system, a fee is levied on vehicles entering and/or exiting a specified geographic area. The fee is not charged for trips entirely within the geographic area. Vehicles are typically charged each time they cross the cordon boundary.
In an area pricing system, a fee is levied on vehicles entering, exiting, or traveling within a specified geographic area. Unlike in a cordon pricing system, the fee is charged for trips entirely within the geographic area. Area pricing systems are technically more challenging than cordon pricing systems because of the need to record all trips within the charge area, not just those that cross a cordon boundary.
In a system of variable parking pricing, a jurisdiction monitors the demand for public on-street and off-street parking facilities and adjusts the prices in response to demand. Implementation of variable pricing often begins with an increase in on-street (metered) parking pricing, as jurisdictions have historically underpriced such parking compared to adjacent off-street parking. Parking prices can be adjusted in real-time as demand varies, or based on periodic monitoring of demand in relation to supply. Although not a necessary feature of variable parking pricing, advanced technology such as web and mobile applications showing available parking are facilitated by the technology needed to implement variable parking pricing.
A parking sales tax can be similar to a typical retail sales tax, in which a tax is paid by the end user on the cost of purchasing parking, or it can be broader and applied to all parking transactions. Examples of taxable parking include parking lots, commercial and municipally-owned sites (e.g., hospitals or universities), residential building sites where visitors are charged, and accommodations or other businesses where there is a separate charge for parking. A parking sales tax increases the cost of driving into the area in which it is applied, and it is intended to reduce the number of vehicle trips in the area. However, since a parking sales tax does not apply to parking spaces that are not subject to charging (e.g., employer-provided parking), it does not uniformly increase the cost of parking within an area.
A parking levy is a recurring tax that applies to private parking spaces within a designated area. Unlike a parking sales tax, which applies to parking transactions, a parking levy is assessed against the owner of a parking space on a regular basis, similar to a property tax. Therefore, unlike a parking sales tax, a parking levy applies to spaces that are not subject to a charge to the end user. The goals of such a system are to encourage the use of public transit and to make more parking spaces available for shoppers and visitors.
A ticket surcharge is a fee added to the cost of an admission ticket to an event to pay for cost externalities associated with the event. For example, events that attract large numbers of vehicle trips contribute to traffic congestion and delays for other travelers in the area, but the cost of the ticket itself would not otherwise reflect these costs. The surcharge could be collected similarly to a sales tax imposed on the sale of the ticket. The revenue generated from the surcharge could be used to subsidize transit operations in the area to offset the congestion impacts of the event. With appropriate institutional arrangements, the ticket itself could also become a transit pass for use for travel to the event.

Table 3-2

PRELIMINARY LIST OF G

GEOGRAPHIC AREA
Downtown LA to Alameda (broad)
Downtown LA to LA River (narrow)
LA LIVE
Hollywood Core
Hollywood/West Hollywood/ Entertainment Area
West LA
West LA/Santa Monica Business Area
City of Santa Monica
LAX Area (within Los Angeles City Limits)
LAX (World Way Only)
Warner Center

The confluence of the planning efforts in the City of Santa Monica and the City of Los Angeles led to the development of two revised Westside alternatives. The first, the "Westside Parcel" area is based on the non-residentially zoned parcels in Los Angeles and high-density mixed-use zones in Santa Monica along Olympic Boulevard on either side of I-405. The second, the "Westside Cordon" area includes the streets directly serving this job-rich area.

INITIAL EVALUATION AREAS

The analysis of the preliminary geographic area evaluation resulted in the advancement of four initial evaluation areas used in the subsequent screening efforts. Based on the review of available data and feedback from stakeholders, the proposed four evaluation areas analyzed are listed below. Figure 3-3 displays the general boundaries of these evaluation areas for the purposes of this section's analysis but the boundaries continued to be refined as the evaluation progressed.

- Westside (cordon) – based on roadways within a defined geographic area
- Westside (parcel) – based on a collection of parcels within a defined geographic area
- LA LIVE
- Downtown LA

Employment and Travel in the Initial Evaluation Areas

Consistent with SCAG's mission of developing regional plans that improve the quality of life for Southern Californians, these four areas were identified as being central to the economy of the entire region as key employment centers. Employment centers attract trips from all over

Figure 3-2

PRELIMINARY GEOGRAPHIC AREAS

EOGRAPHIC AREAS AND RECOMMENDATIONS

BOUNDARIES	RECOMMENDATIONS & COMMENTS
N: US-101 E: LA River S: I-10 W: I-110	Not recommended for further evaluation due to insufficient amount of trips beginning and ending east of Alameda Street to justify a larger downtown cordon.
N: US-101 E: Alameda Street S: I-10 W: I-110	Recommended for further evaluation but questions remained about whether to include or exclude trips on the downtown freeway ring.
N: Olympic Boulevard E: Flower Street S: Washington Boulevard W: Union Avenue	Recommended for further evaluation with reconsideration of boundaries and type of pricing tool, potentially tying to sale of tickets.
N: US-101, Highland Avenue, Franklin Avenue E: Wilton Place S: Melrose Avenue W: La Brea Avenue	Not recommended for further evaluation as not enough trips were attracted to this area under existing conditions and expected future development growth. Additionally, a large share of traffic has both origin and destination outside of the potential charging area.
N: Sunset Boulevard, Franklin Avenue E: Gower Street S: Melrose Avenue W: Doheny Drive	Not recommended for further evaluation as large share of trips would be limited to weekend or nighttime only. As an entertainment/event-based alternative, the LA LIVE scenario showed more potential and was advanced instead.
N: San Vicente Avenue, Wilshire Boulevard E: Beverly Hills City Limit S: Pico Avenue W: Centinela Avenue (Santa Monica City Limit)	Recommended for further evaluation but should include parts that focus on employment core with congestion as this area has a large employment base and residential population. Congestion in Century City is largely limited to the major roadway approaches (Santa Monica and Olympic Boulevards) with less congestion on internal roadways.
N: Montana Avenue E: I-405 S: I-10 W: Pacific Ocean	Recommended for further evaluation but should include parts that focus on employment core with congestion as this area has a large employment base and residential population.
N: City Limits E: City Limits S: City Limits W: City Limits	Recommended for further evaluation but should include parts that focus on employment core with congestion due to the broad definition of the charging area.
N: Manchester Avenue E: La Cienega Boulevard S: I-105 W: Pershing Drive	Not recommended for further evaluation due to many one-time or occasional visitors accessing this area. The airport's periods of peak demands do not coincide with general roadway peak demands so would not alleviate regional congestion. Additionally, extreme jurisdictional complexity was expected to coordinate LA County and the Cities of Hawthorne, El Segundo, and Inglewood.
N: World Way E: Sepulveda boulevard S: World Way W: Pershing Drive	Not recommended for further evaluation due to many one-time or occasional visitors accessing this area. Additionally, this area may conflict with the federal Passenger Facility Charge.
Specific Plan Area, generally: N: Vanowen Street E: De Soto Avenue S: US-101 W: Topanga Canyon Boulevard	Not recommended for further evaluation despite having very high trip attractions as roadway capacity is also much higher than in many other areas evaluated.

the region and have predictable peak periods with ample opportunity for congestion reduction improvements. Most workers only need their vehicle to commute to/from work and therefore can likely be incentivized to shift their travel modes to transit, carpooling, or other higher occupancy and space-efficient modes. For areas with high amounts of resident and worker traffic, travelers can be incentivized to shift travel time of day for discretionary trips from peak to off-peak to more evenly distribute traffic flows throughout the day and lower the extreme peaks. Improving the vitality of such employment areas will benefit all Southern Californians, whether they live and work in those areas or other parts of the region. Each of these areas employs or otherwise attracts people from all over the region.

As Table 3-3 shows, each of these areas is a significant regional employment center and attracts a large number of vehicle trips each weekday from commuting workers as well as overall vehicle trips, including pass through trips. Each area attracts workers from different parts of the Southern California region, as shown in Table 3-4 (see Figure 3-4 for map of residence location districts). For example, Downtown Los Angeles attracts a large share of its workers from east and southeast LA County and the San Gabriel Valley. The Westside areas attract a large share of their workers from West Los Angeles, the San Fernando Valley, and the South Bay.

As shown in Table 3-5, each of the areas also experience congestion on arterial roadways. All of the areas experience low travel speeds during the PM peak period. Downtown LA has the lowest uncongested speed because of the density of the roadway network and higher number of signalized intersections, but the Westside areas experience a more significant degradation in travel speeds during the PM peak period, as evidenced by the lowest PM peak speed ratio.

Off-street parking costs are high in the evaluation areas, contributing to high transportation costs for those who drive to these areas. The highest daily parking costs were found in the Westside areas at the time of analysis, but parking costs were also high and since risen at a greater rate in Downtown LA than in the Westside. Daily parking costs are lower in the LA LIVE area, because much of the parking demand in that area occurs in the evening when parking costs rise significantly for events rather than for recurring, commuter parking.

The proposed evaluation areas vary with respect to existing and potential transit usage. Approximately one in five workers in Downtown LA uses transit to get to work each day,

Figure 3-3

INITIAL EVALUATION AREAS

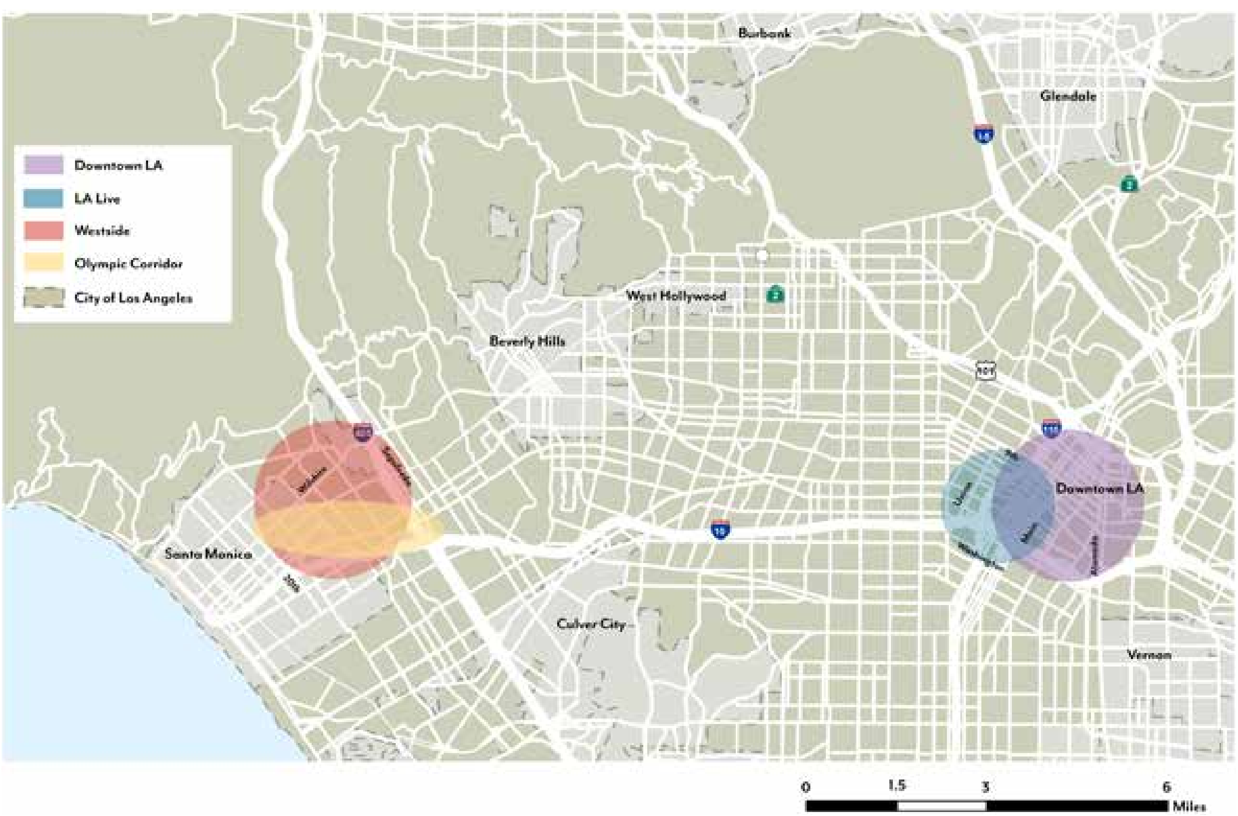


Table 3-3

EMPLOYMENT AND TRAVEL IN PRELIMINARY PROJECT EVALUATION AREAS

EVALUATION AREA	(SQ. MI.)	TOTAL EMPLOYMENT	TOTAL # OF TRIPS ON AREA ROADWAYS[1]	TOTAL # OF TRIPS THAT START OR END IN AREA[2]	TOTAL # OF TRIPS THAT START AND END IN AREA[3]	VMT IN AREA[4]	VHT IN AREA[5]	ROADWAY MILES IN AREA[6]
Downtown LA	3.36	183,321	953,586	600,040	46,853	1,009,610	42,361	88
LA LIVE	1.44	53,260	544,548	193,985	8,256	465,832	19,609	39
Westside (parcel)	0.85	34,716	310,168	115,171	3,629	141,767	5,697	12
Westside (cordon)	3.43	79,536	552,101	298,552	22,440	473,976	19,408	45

Source: SCAG 2012 RTP Model.
Notes:
1 Number of vehicle trips using roadways (excluding freeways), regardless of origin or destination. One vehicle going to work in the morning and returning home in the evening would count as two trips.
2 Number of vehicle trips using roadways (excluding freeways), with either an origin or a destination in the area. Includes trip that both start and end in the area.
3 Number of vehicle trips using roadways (excluding freeways), with both an origin and a destination in the area.
4 Total daily vehicle miles traveled on roadways (excluding freeways).
5 Total daily vehicle hours of travel on roadways (excluding freeways).
6 Total miles of roadway in area, regardless of the number of lanes. Only includes roadways in the model network (generally collector or higher classification roadways).

Figure 3-4

RESIDENCE LOCATION DISTRICTS

Table 3-4

EMPLOYMENT COMMUTING TRAVEL ORIGINS

EVALUATION AREA	NORTH LA COUNTY	VENTURA COUNTY	MALIBU/LAS VIRGENES	SAN FERNANDO VALLEY	ARROYO VERDUGO AREA	SAN GABRIEL VALLEY	SAN BERNARDINO/ RIVERSIDE	ORANGE COUNTY	GATEWAY CITIES	SOUTH BAY
Downtown LA	5.0%	1.9%	0.4%	8.7%	7.8%	15.0%	6.7%	7.1%	12.3%	11.3%
LA LIVE	2.3%	1.9%	0.6%	8.0%	8.2%	11.3%	6.0%	7.9%	10.4%	10.4%
Westside (parcel)	2.2%	2.9%	1.5%	14.1%	5.2%	4.5%	3.2%	4.5%	4.4%	10.8%
Westside (cordon)	2.6%	3.0%	1.4%	14.2%	4.7%	4.5%	3.3%	4.3%	4.4%	11.1%

Source: Longitudinal Employer Household Dynamics (LEHD), 2011

Table 3-5

TRAVEL CHARACTERISTICS OF PRELIMINARY EVALUATION AREAS

EVALUATION AREA	UNCONGESTED SPEED (MPH)[1]	PM PEAK SPEED (MPH)[2]	SPEED RATIO[3]	AVERAGE DAILY PARKING COST[4]	TRANSIT MODE SHARE[5]	% OF WORKERS CLOSE TO METRO RAIL[6]	% OF WORKERS CLOSE TO METROLINK[7]
Downtown LA	24	22	0.90	$19.13	21%	8.6%	72.9%
LA LIVE	26	23	0.90	$12.22	20%	10.7%	68.2%
Westside (parcel)	29	24	0.81	N/A	5%	6.3%	50.2%
Westside (cordon)	30	23	0.76	$22.36	5%	6.5%	50.1%

Notes:
1 INRIX speed data for March 2012. Highest hourly average roadway speed observed during a weekday.
2 INRIX speed data for March 2012. Average pm peak period (3 pm to 7 pm) roadway speed.
3 PM Peak Speed divided by Uncongested Speed.
4 Calculated using 2013 data from Parkopedia.com. Average daily parking rate for off-street parking. Cost does not include monthly or "early-bird" discounts.
5 Census Transportation Planning Products (CTPP) 2000 Part 3 (Journey-to-Work Flow Tables). CTPP 2010 Journey to Work data had not been released at the time of the analysis for pr
6 Longitudinal Employer-Household Dynamics (LEHD) 2011. Number of workers within a 0.5 mile radius of existing or future Metro Rail stations.
7 LEHD 2011. Number of workers within a 7.5 mile radius of Metrolink stations. Weighted average drive distance of existing Metrolink riders is 7.5 miles, based on the National Household
8 SCAG RTP 2012 model. Number of jobs within a 0.5 mile radius of existing or future Metro Rail stations.

SANTA MONICA	WEST LA	CENTRAL LA	OTHER	**Total**
1.2%	3.8%	13.6%	5.2%	**100%**
1.5%	4.4%	17.1%	10.0%	**100%**
9.5%	17.9%	12.3%	7.1%	**100%**
9.7%	16.9%	12.0%	7.7%	**100%**

# OF JOBS CLOSE TO RAIL STATION[8]	% OF JOBS CLOSE TO RAIL STATION
168,297	92%
51,329	96%
34,716	100%
52,462	66%

eliminary areas.

Travel Survey (NHTS).

compared to only one in twenty in the Westside areas. Because each of the proposed evaluation areas attracts workers from all over Southern California, only a relatively small share of workers in each area live within walking distance (0.5 mile) of a Metro Rail station. A larger share lives within typical driving distance (7.5 miles) of a Metrolink commuter rail station.

The vast majority of jobs (and other destinations) in Downtown LA and the LA LIVE area are readily accessible by Metro Rail. With the completion of the Metro Expo Line Phase 2 light rail line, essentially all of the jobs in the Westside parcel area are now within walking distance of a Metro Rail station, while approximately two-thirds of jobs in the larger Westside area are within walking distance of a Metro Rail station. One potential benefit of a congestion pricing system is the expansion of the labor pool available to employers. By reducing travel times and/or increasing convenient transit options to job locations within an area, a pricing system can make those jobs more attractive to workers in more areas of Southern California.

Initial Alternatives for First and Second Stage Screening

Following initial analysis of the employment and travel patterns in the four initial evaluation areas, the areas were matched with options from the pricing mechanism toolbox. Multiple pricing tools were considered for each area, but not all tools were suited to all geographic areas. Table 3-6 summarizes the resulting eleven initial alternatives. The alternatives were put through to a two-stage screening process that conducted a conceptual cost-benefit analysis (first stage) and fatal flaw (second stage) based on the identified project goals and objectives.

Evaluation Framework for Screening Initial Alternatives

A set of goals and objectives was developed to guide the screening of alternatives. The eleven alternatives were screened through a two-step process based on the identified project goals and objectives. The two alternatives with the highest potential to achieve these goals and objectives were further evaluated in the subsequent phase.

Goals and Objectives

The following three primary goals were established to guide the alternatives' development and evaluation:

- Reduce congestion and associated environmental consequences
- Result in positive financial and economic outcomes, including quality of life outcomes
- Be institutionally, technically, and socially implementable

These three goals led to the eight objectives described in Table 3-7.

Performance Measures

Table 3-8 summarizes the performance measures associated with each objective, including the associated quantification metrics as well as any qualitative issues and some of the undesirable outcomes associated with each objective.

Approach for Preliminary Screening (First and Second Stage Screening)

This section presents the approach for screening of the congestion pricing alternatives and is intended to cover the full list of 11 initial alternatives listed in Table 3-6. It was conceived as an early-stage screening tool when quantitative results regarding each performance measure was not available. Under ideal conditions, the screening approach would consist of a comprehensive and detailed evaluation of each alternative under consideration relative to a reference case (or "No Build") scenario; however, limited resources were available to examine the full impacts of

Table 3-6

SUMMARY OF 11 INITIAL ALTERNATIVES

LOCATION	PRICING MECHANISM
Westside Cordon	Cordon Charge Area Charge Parking Levy Parking Sales Tax
Westside Parcel	Variable Parking Pricing Parking Levy Parking Sales Tax
LA LIVE	Parking Sales Ticket Surcharge
Downtown LA	Cordon Charge Area Charge

each alternative at the preliminary screening stage. For this reason, a two-stage process was devised. After describing the traffic conditions and available decongestion benefits of the four evaluation areas, the first stage determined if each congestion pricing alternative had positive economic potential, based on a basic cost-benefit review. The alternatives with positive economic potential were retained for the second-stage of the screening analysis, which examined whether those alternatives met the minimum requirements associated with the additional objectives (economic competitiveness, livability, technical implementation, and social/public acceptance). The alternatives which also met the minimum requirements of these second set of considerations made the short list of congestion pricing alternatives which underwent a more quantitative evaluation.

First-Stage Screening
The first step in the screening process was to identify the potential for behavioral changes for each alternative and then determine which of the eleven initial alternatives had economic potential, discarding those which clearly do not. The screening was based on a conceptual cost-benefit analysis and recognized that the alternatives were not yet defined in fully detailed terms; therefore, quantified cost-benefit results are not required.

The first three evaluation categories correspond to the first three objectives (first three rows of Table 3-8). The first row asks whether the alternative provides potential improvements in mobility. While there were no estimates of potential time savings from any one alternative, it was possible to determine whether the geographic area under consideration in each alternative was subject to substantial peak period congestion. Areas subjected to such congestion can in principle offer the potential for improved mobility through appropriate pricing designed to alter driver behavior (i.e., change the timing of trips, change mode of transportation, or re-organize trips in other ways). Alternatives where the geographic area is not subject to protracted peak time congestion would be designated as "No"; implying that there is limited potential for a significant improvement in mobility (i.e. time savings), because traffic is already at close to free-flow speeds.

A similar approach was taken for the second category (improved environmental outcomes) recognizing that reduced emissions were also driven by the change in auto trips and driver behavior. Hence, the environmental impacts tend to be directionally similar to the mobility impacts based on VMT.

The third evaluation category asked whether the pricing alternative would require additional capital and operating costs to implement. For example, cordon or area charging options both require additional capital costs as well as operating costs, unless they rely on fee collection infrastructure already in place. However, parking levies may not require much additional costs.

Second-Stage Screening (Fatal Flaw Analysis)
The second-stage screening took the alternatives which passed the first stage and examined whether each of these may have a "fatal flaw" in terms of four objectives which needed to be considered to ensure the potential for a positive outcome. A fatal flaw could refer to one of a number of adverse factors which would seriously undermine the viability of a pricing alternative and which cannot be mitigated or offset through the design of the pricing alternative or through other policies. Table 3-9 lists the objectives screened in this stage with examples of fatal flaws for each. If there was no potential fatal flaw or serious downside which undermined the pricing alternative at hand, it proceeded to the short list alternatives for a detailed analysis.

Traffic Conditions and Available Decongestion Benefits
Existing traffic conditions were estimated using speed for each area provided by INRIX. Since the INRIX data provides information about traffic speeds but not traffic volumes, the number of vehicle trips in each area was obtained from the SCAG 2012 RTP/SCS travel demand model. This model was also used to calculate the average trip length in each area. Congested trip times were calculated using observed speeds from the INRIX data, and uncongested trip times were calculated using observed speeds during uncongested overnight hours. For each time period during the day, the estimated average travel time per trip was compared to the uncongested (or free-flow) travel time for the same trip.

In the Westside (Cordon) area, congestion causes an increase in travel time of 35% during the PM peak period, as can be seen in Table 3-10. The second most congested time is midday, with a 21% increase in trip time. On an annual basis, these delays represent almost 1.2 million person-hours of lost time (weekdays only). This indicates that there is a definite potential for congestion alleviation and associated economic advantages to addressing this issue.

Traffic conditions in the Westside (Parcel) area are relatively more fluid than the Westside (Cordon) area. Maximum delay time is 23% and occurs during the PM peak time, as can be seen in Table 3-11. Furthermore, the number of trips is considerably lower in this area, making for a total annual delay of 290,850 person-hours, less than one-quarter that of the Westside (Cordon) area. There is some potential for improvement in traffic conditions, but given the lower potential decongestion benefits, the mechanisms applied would need to be based on minimal capital and operating expenses to be economically viable.

On average, traffic congestion in the LA LIVE area appears less severe than in the Westside area. The worst delay increase at peak time is only 13% of uncongested trip time, suggesting very little room for improvement. However, only typical commute conditions are reflected in Table 3-12. This area also has a high concentration of activity with hotels, an arena, and theaters. On days with events (which is a very high number of days given that the arena hosts two basketball teams and a professional hockey team), the roads in the area become very congested. This situation is not reflected in average data generated by the travel demand model. Nonetheless, it seems reasonable to conclude that any measure applied in this area would have to target these traffic-inducing events specifically. Otherwise, they would generate increased travel costs during periods where little decongestion benefits would be seen.

The degree of congestion in the Downtown LA area is similar to that in the LA LIVE Area. The highest delay increase at peak time is also only 12% of trip time suggesting little room for congestion alleviation. Table 3-13 presents these results.

The results presented in Table 3-10 through Table 3-13 show that two areas (the Westside (Cordon) area and the LA LIVE area) experience the greatest relative increase in delay from congestion, and therefore have the greatest potential to benefit from a decongestion program (on a typical day). Westside (Cordon) area drivers experience almost 1.2 million total person-hours of delay each year, and LA LIVE area drivers experience almost 720,000 total person-hours of delay. While the total person-hours of delay is greater in the Downtown LA area, the delay per trip is substantially less.

Westside (Cordon) Area: First Stage and Second Stage Screening

The first-stage screening consisted of a conceptual cost-benefit analysis to determine if the alternative had the potential to generate a positive economic impact. Benefits are largely driven by a reduction in VMT. Having already determined if there is room for improvement in terms of decongestion, it was then essential to determine if the pricing alternative had the potential to change travel behavior and reduce VMT. The first-stage screening was divided into two steps, first to assess the potential for behavioral change and second, to integrate this change in the conceptual cost-benefit analysis.

First Stage Screen

Potential for Behavioral Change
The potential for behavioral change in the Westside (Cordon) area is presented by mechanism type in Table 3-14.

Overall, there is potential for significant reduction in VMT in the case of the cordon charge in the Westside (Cordon) area, both in the short and long-term. There is also a significant potential for reduction in VMT in the case of the area charge. This reduction might even be slightly higher than the cordon charge as it also captures local trips, which represents an additional 4% of trips that may be affected.

Economic Potential Analysis
Given their potential for reductions in VMT, both the cordon charge and the area charge are analyzed for their economic potential. The analysis is presented in Table 3-15.

Both alternatives in the Westside (Cordon) area present potential positive overall economic impacts. The benefits may be slightly higher in the case of the area charge, but the capital and operating costs are also likely to be higher. The second-stage screening was then used to determine if these pricing mechanisms should indeed be short-listed for economic analysis.

Second-Stage Screening/Potential Fatal Flaw Analysis
The potential fatal flaws analysis is presented by topic in Table 3-16. For each topic, potential positive and adverse impacts are identified for each pricing mechanism. If an adverse impact is considered a potential fatal flaw that might seriously undermine the viability of a congestion pricing alternative and cannot be mitigated or offset through the design of the congestion pricing alternative or through other policies, it is identified as such.

Neither the cordon charge nor the area charge appeared to present potential fatal flaws. Both alternatives were therefore retained in the short-list for further analysis.

Westside (Parcel) Area: First Stage and Second Stage Screening

First Stage Screen

Potential for Behavioral Change
Three pricing mechanisms were selected in the long list of alternatives for the Westside (Parcel) Area, all of which are related to parking rather than an area charge given the characteristics of the zone: a parking levy, a parking sales tax and variable parking pricing. The potential for each of these mechanisms to change travel behavior is presented in Table 3-17.

Overall, the parking levy presents no potential for significant reduction in VMT in the short-term and limited potential in the mid-term. Both the parking sales tax and the variable parking pricing present some potential for reduction in VMT in the charging area. The potential for reduction in VMT of a pricing mechanism is at the basis of all the benefits that may be generated by this measure. If there is no (or very limited)

Table 3-7

EVALUATION OBJECTIVES FOR PROGRAM ALTERNATIVES

OBJECTIVE	DESCRIPTION
Improve Mobility and Transportation User Experiences	Improving mobility and transportation user experiences is a core objective of congestion pricing systems. In practice, this means reducing the travel time and/or costs required for people to get to their respective work, leisure, school or other destinations. By introducing some form of congestion pricing, the additional cost of traveling will tend to reduce the demand for travel to the designated area during congested, peak periods (i.e., discretionary or low-value trips will tend to switch to off-peak periods; to other modes; combine with other trips; switch to other destinations or are suppressed altogether). This reduces congestion for the remaining higher-value trips, reduces excess fuel costs, and if fewer vehicle miles are driven, it can also lead to savings in vehicle operating costs. Congestion pricing can thus be considered a type of road user charge where users are paying for their contribution to congestion in the designated area. This is most applicable in high-density urban areas, where few other options remain to alleviate the road congestion. Other related changes in travel behavior, such as increasing transit use and encouraging mode shift, including walking, bicycling, and carpooling, are part of this objective. These behaviors contribute to make more efficient use of the transit network and increase the capacity of the designated area to absorb a greater number of commuters or visitors at peak travel times.
Improve Environmental Outcomes	As a result of California's Sustainable Communities and Climate Protection Act (SB 375), the region of Southern California is required to reduce GHG emissions from passenger vehicles. The RTP/SCS developed by SCAG and its transportation partners seeks to achieve the SB 375 targets by providing incentives for higher density, mixed-use developments which support more sustainable transportation choices. However, changes in land-use alone may not be enough to achieve the emission reduction targets. Congestion pricing systems represent an additional measure for reducing GHG emissions and ambient levels of air pollution by addressing the road congestion problem. The improvement in local air quality will tend to be greater than the reduction in VMT due to reduced congestion and less idling time for vehicles. These improved environmental outcomes, which include reductions in noise levels, contribute to healthier communities and a higher quality of life for those who live and work in the affected areas.
Minimize Capital and Operating Costs	This objective refers to minimizing the combined value of the capital and operating costs required to implement a system, but does not necessarily imply the congestion pricing system with the lowest combined capital and operating costs is most desirable. Rather, the objective recognizes the purpose of congestion pricing is to achieve the greatest level of mobility, environmental and other decongestion benefits after netting out capital and operating costs. This test requires that the value of the time savings and other mobility benefits combined with the value of any environmental benefits from the congestion pricing system be greater than the value of capital and operating costs over the evaluation period. Financial feasibility (or cost recovery) is the extent to which revenue generated by a congestion pricing alternative covers operating and capital costs. This factor is also of interest because it can affect funding available for implementation of the alternative. However, a higher or lower financial cost recovery does not imply the alternative is more or less economically justified or desirable from a public-sector perspective. A low financial cost recovery may be perfectly consistent with an alternative that generates benefits greater than the capital and operating costs on a present value basis.
Improve Economic Competitiveness	Improved economic competitiveness as a result of the decongestion and environmental benefits of a charging system can take the form of a higher standard of living for people who live or work in the designated area and/or higher productivity for the businesses located in the area. A higher standard of living can result from travel time savings and/or higher take-home pay. Higher productivity for businesses in the charging area results from more efficient labor markets and improved access to qualified labor, in addition to business travel time savings and more attractive street-level conditions more conducive to commercial/retail activity and business meetings. Higher productivity translates into higher sales relative to competitors outside the designated area. In order to achieve improved competitiveness, the magnitude of improvements in standard of living (or productivity) must be greater than the congestion charge assumed by the individual or business. In instances where the decongestion improvements are not greater than the congestion charge, individuals or businesses affected will have an incentive to relocate their economic activities to areas outside the charging zone. An improvement in economic competitiveness would ultimately mean that the congestion charging area would become more attractive either as a residential location for individuals and/or as a business location for firms.

Table 3-7

EVALUATION OBJECTIVES FOR PROGRAM ALTERNATIVES *(CONTINUED)*

OBJECTIVE	DESCRIPTION
Improve Livability in Transportation	The concept of livability was introduced in 2009 by the Partnership for Sustainable Communities to promote interagency coordination to improve quality of life in the communities. Improving the livability of a community is a policy objective guided by six principles: (1) providing more transportation choices, (2) promoting equitable, affordable housing, (3) enhancing economic competitiveness, (4) supporting existing communities, (5) coordinating and leveraging federal policies and investment, and (6) valuing communities and neighborhoods. Several of these components overlap with some previously identified objectives such as improving environmental outcomes, improving mobility and transportation user experiences and improving economic competitiveness, but the livability objectives have a community perspective. For example, reducing pollution is measured in terms of reducing climate change emissions in the "Improving Environmental Outcome" objective, but it focuses on local air and noise pollution in the "Improving Livability" objective.
Be Implementable Under Relevant Governmental and Institutional Regulations and Structures	Congestion charging systems are characterized by certain governance arrangements regarding the collection of the congestion charge; accountability for operations/administration costs and revenues; and the overall transparency of the system, including the clear communication of its objectives and the regular reporting of results. Some governance arrangements may be more transparent and preferable than others. This objective is intended to convey which alternatives entail more (or less) desirable governance arrangements. Alternatives that are more transparent and have superior governance arrangements should be preferred.
Be Implementable with Current or Reasonably Foreseeable Technology	Technical implementation considerations can also differ significantly between alternatives, depending on the type of technology chosen and whether the technology has already been implemented for similar uses. This objective conveys which alternatives entail higher (or lower) technology implementation challenges, some of which may be reflected in the time required to implement. Alternatives with lower or fewer implementation challenges would be deemed more desirable; however, trade-offs between different objectives can be made. For example, capital and operating costs can be higher for some congestion charging systems which rely on tried and tested technologies.
Be Acceptable to the Relevant Social and Community Organizations	Social and public acceptance issues can differ significantly across congestion pricing systems. This evaluation category is intended to capture a wide range of potential stakeholder issues ranging from equity issues (e.g., if the charge unduly impacts low-income households) to distributional impacts of the charge across certain socio-demographic groups. In some cases, undesirable impacts can be mitigated through complementary measures (e.g., tax credits or other income alleviation measures for low-income households, such as Metro's Toll Credit Program). In other cases, the design features of the congestion pricing system can be adjusted to address the impacts on particular groups (e.g., providing a steep discount for residents of the charge zone). The primary purpose of this objective is to convey which alternatives have a higher (or lower) level of public acceptance and therefore more (or less) desirable. However, this evaluation category is also intended to encourage active consideration of the complementary measures or system design features which can improve social acceptance of a congestion pricing system likely to deliver tangible decongestion benefits.

Table 3-8

EVALUATION CATEGORIES AND PERFORMANCE MEASURES FOR FIRST AND SECOND STAGE SCREENING

OBJECTIVES / EVALUATION CATEGORIES1	PERFORMANCE MEASURES	METRICS	POTENTIAL UNDESIRABLE IMPACTS
Improve Mobility and Transportation User Experiences	• Travel time savings for road users (and for users switching to other modes) • Trip time reliability • Automobile operating cost savings • Safety benefits	• Number of hours saved • Monetary value of time saved • Reduction in VMT (proxy for operating costs and safety benefits)	• Trip diversions • Increased traffic just outside congestion zone
Improve Environmental Outcomes	• Local air quality impacts, including NOx, PM2.5 emissions reductions • Noise and vibration impacts • Greenhouse gas emissions	• Reduction in VMT (proxy for emission reductions and noise and vibration impacts)	• Trip diversions • Increased traffic just outside congestion zone
Minimize Capital and Operating Costs of Proposed Initiative	• Capital expenditures (e.g., road works, gantries, electronic communications and monitoring equipment) • Operating costs (e.g., labor costs, consumables for monitoring, enforcement and payment) • Revenues and cost recovery	• Total capital and operating costs • Percentage of cost recovery by revenues	• Gold-plating (higher capital expenditure than required) • Inefficient operations and enforcement
Improve Economic Competitiveness	• Higher standard of living (travel time savings; accessibility) • Higher productivity (improved labor market; business travel time savings; enhanced place-making)	• Number of hours saved • Improved accessibility to congestion area • Gross Revenue Product and employment impacts	• Diversions of high-value jobs and economic activity outside the charging zone
Improve Livability in Transportation	• Improved accessibility to employment and local services • Increased active transportation alternatives • Increases in property values • Other relevant objectives in state legislation and community plans (e.g.: SB375 GHG emission reduction targets; Santa Monica's No Net New Evening Peak Period Vehicle Trips)	• More attractive locations for retail and related commercial activities • Estimated number of businesses/services per capita in a specific radius • Supporting new bike paths, safer sidewalks, etc. • Change in local property values	• Trip diversions • Decrease in land value just outside zone
Be Implementable Under Relevant Governmental and Institutional Regulations and Structures	• Accountability for system design, revenue collection, operations, etc. • Transparency		
Be Implementable with Current or Reasonably Foreseeable Technology	• Whether the technology has been implemented on commercial scale • Time lag required for implementation	• Whether the technology has been implemented elsewhere • Number of months lag to implement new technology	• Implementation delayed or aborted due to technical risks
Be Acceptable to the Relevant Social and Community Organizations	• Public acceptance • Vertical equity • Horizontal equity • Other stakeholder issues	• Potential equity issues	

Table 3-9

FATAL FLAW ANALYSIS OBJECTIVES AND EXAMPLES

OBJECTIVE	FATAL FLAW EXAMPLE
Improve competitiveness	Reduced competitiveness of an employment hub within the charging zone, as compared to other competing hubs outside the zone
Improved livability	Reduced opportunities for active transportation
Technical implementation track record	Road pricing mechanism which has not yet been implemented on a commercial scale
Social and public acceptance considerations	Active opposition from stakeholders

Table 3-10

CONGESTION CONDITIONS IN THE WESTSIDE (CORDON) AREA

	AM 6-9 AM	MIDDAY 9 AM-3 PM	PM 3-7 PM	EVENING 7-9 PM	NIGHT 9 PM-3 AM
Average number of trips	107,945	198,371	165,463	33,739	46,583
Average length of trip (miles)	0.87	0.84	0.90	0.79	0.85
Average time per trip (min)	1.98	2.01	2.40	1.82	1.82
Estimated uncongested time per trip (min)	1.71	1.65	1.78	1.56	1.68
Average delay per trip (min)	**0.27**	**0.35**	**0.62**	**0.26**	**0.14**
Total vehicle hours of delay	**479**	**1,167**	**1,715**	**145**	**109**
Delay % increase (in trip time)	**16%**	**21%**	**35%**	**16%**	**8%**
Annual person hours of delay (weekdays only)	**1,175,021**				

Sources: INRIX (average speed data), SCAG 2012 RTP Model (average number of trips, average length of trips), AECOM calculations.

Table 3-11

CONGESTION CONDITIONS IN THE WESTSIDE (PARCEL) AREA

	AM 6-9 AM	MIDDAY 9 AM-3 PM	PM 3-7 PM	EVENING 7-9 PM	NIGHT 9 PM-3 AM
Average number of trips	60,481	111,096	98,060	17,298	23,233
Average length of trip (miles)	0.47	0.46	0.46	0.42	0.41
Average time per trip (min)	1.09	1.12	1.16	0.95	0.93
Estimated uncongested time per trip (min)	0.96	0.93	0.95	0.87	0.84
Average delay per trip (min)	**0.13**	**0.19**	**0.22**	**0.09**	**0.09**
Total vehicle hours of delay	**136**	**346**	**353**	**25**	**35**
Delay % increase (in trip time)	**14%**	**20%**	**23%**	**10%**	**11%**
Annual person hours of delay (weekdays only)	**290,850**				

Sources: INRIX (average speed data), SCAG 2012 RTP Model (average number of trips, average length of trips), AECOM calculations.

potential, then the economic impact will be negative because implementation costs will outweigh benefits. This is even more so in the specific case of the Westside (Parcel) area where the potential for improvement of current traffic conditions is very limited. For this reason, the parking levy option was not submitted to the first and second-stage screening as there is limited potential reduction of VMT in the short-term.

Economic Potential Analysis

The total delay hours in the Westside (Parcel) area are much smaller than in the Westside (Cordon) area with little room for improvement. Additionally, there are no more than 38% of the trips which can be affected by parking charges. The charges must therefore present obvious VMT reduction to present a congestion reduction benefit. The economic potential for the parking sales tax and variable parking pricing in the Westside (Parcel) area is presented in Table 3-18.

Despite low capital requirements, potential overall economic impacts are likely minimal to nothing for parking sales tax due to very limited benefits and some operating spending requirements. They are also insignificant in the case of variable parking pricing due to very limited benefits and some capital and operating spending requirements. Due to their lack of economic potential, the parking sales tax and variable parking pricing mechanisms in the Westside (Parcel) area were not considered for second-stage screening and were excluded from the short-list of alternatives.

LA LIVE Area: First and Second Stage Screening

First Stage Screen

Potential for Behavioral Change

The LA LIVE area does not present significant problems in terms of traffic congestion during typical days nor does it present great potential for improvement. However, congestion occurs when well-attended sporting or entertainment events are held. Measures targeted to these specific situations are therefore considered: ticket surcharge and parking sales tax. The analysis for potential behavioral change due to these pricing mechanisms is presented in Table 3-19.

There is potential for reduction in VMT in the charge zone in the case of the parking sales tax. However, the potential for congestion alleviation is relatively low, because this VMT reduction may not have much impact on congestion, except during events that generate traffic. There is some potential for reduction in VMT in the case of the ticket surcharge only if it provides a free transit pass or other benefits that create an incentive for behavioral change. This measure is targeted specifically to traffic during events and will not generate any type of behavioral change outside the event times.

Economic Potential Analysis

The analysis of economic potential for the pricing mechanisms in the LA LIVE area is presented in Table 3-20.

The parking sales tax has the potential to have positive overall economic impacts. Since the potential for improvement during normal hours is low, these positive impacts would be concentrated during events. The ticket surcharge also has the potential to generate overall positive economic impacts but only during events. Both alternatives will therefore be submitted to the second-stage screening process in the next section.

Second-Stage Screening/Potential Fatal Flaw Analysis

The analysis for potential fatal flaws is presented in Table 3-21 for each pricing mechanism.

Neither parking sales tax nor ticket surcharge measures in the area of LA LIVE present a potential for an obvious fatal flaw. Both have the potential to generate positive economic impacts; therefore, both alternatives advanced to the short-list.

Downtown LA Area: First and Second Stage Screening

First Stage Screen

Potential for Behavioral Change

Similar to the LA LIVE area, the Downtown LA area does not present significant problems in terms of traffic congestion during morning and evening peak times nor does it present great potential for improvement (although conditions have been changing in recent years and will need to be monitored). Contrary to the LA LIVE area however, there does not seem to be specific times (such as events) where traffic would be unusually higher. Four measures are considered and analyzed in Table 3-22: a cordon charge, an area charge, a parking levy and variable parking pricing.

The cordon charge presents some potential for reduction in VMT in charge zone, both in the short and long-term. The area charge's potential for reduction in VMT might be slightly higher due to the potential reduction on the 5% local trips. The variable parking pricing might also present potential for reduction in VMT. In all three cases, the potential congestion reduction appeared to be limited due to the fact there is currently not the level of congestion in this area as experienced in other study locations (e.g., Westside). In the case of the parking levy however, there is no potential for significant reduction in VMT in the short term and the potential is limited in the medium-term. For this reason, this pricing mechanism was not submitted to an analysis of economic potential.

Economic Potential Analysis

The analysis of economic potential for pricing mechanisms in the Downtown LA area is presented in Table 3-23.

In the case of the cordon charge and the area charge, potential benefits did not appear to be significant enough to justify the capital and operating costs, at least over the near-term. This is likely to change in the future, however, as congestion levels increase. In the case of variable parking pricing, potential overall economic impacts appeared to be minimal due to limited benefits and some capital and operating cost requirements. As such, pricing mechanisms for the Downtown LA area were not part of the short-listed alternatives. A follow-on analysis of the area may be warranted as conditions change.

Table 3-12

CONGESTION CONDITIONS IN THE LA LIVE AREA

	AM 6-9 AM	MIDDAY 9 AM-3 PM	PM 3-7 PM	EVENING 7-9 PM	NIGHT 9 PM-3 AM
Average number of trips	111,384	194,437	185,473	24,388	28,866
Average length of trip (miles)	0.88	0.79	0.90	0.73	1.01
Average time per trip (min)	2.34	2.07	2.39	1.80	2.64
Estimated uncongested time per trip (min)	2.08	1.85	2.12	1.71	2.38
Average delay per trip (min)	**0.27**	**0.23**	**0.26**	**0.09**	**0.26**
Total vehicle hours of delay	**497**	**730**	**818**	**35**	**124**
Delay % increase (in trip time)	**13%**	**12%**	**12%**	**5%**	**11%**
Annual person hours of delay (weekdays only)	**716,270**				

Sources: INRIX (average speed data), SCAG 2012 RTP Model (average number of trips, average length of trips), AECOM calculations.

Table 3-14

POTENTIAL FOR BEHAVIORAL CHANGE IN THE WESTSIDE (CORDON) AREA BY TYPE OF PRICING MECHANISM

POTENTIAL BEHAVIORAL CHANGE:	1. CORDON CHARGE
Affected population	Up to 96% of total vehicle-based trips in the area: • 54% of trips end or start in the area • 42% pass through the area
Trip diversion	Potential to divert trips as pass-through trips may choose alternate routes to their destinations.
Change in time-of-day travel	Potential change in time-of-day of travel, including mid-day if charge is lower than for peak times (especially for discretionary trips and urban freight deliveries).
Trip suppression and re-organization	Potential for trip suppression and re-organization (especially discretionary trips).
Carpooling	Potential for increased carpooling to save on fees.
Modal shift to active transportation	Potential modal shift to active transportation for workers who live adjacent to the charging zone (Santa Monica, West LA, Central LA – approx. 38% of workers), provided appropriate facilities are made available (e.g. safe reserved bike lanes).
Modal switch to public transit	Potential for modal switch to public transit has grown since opening of Expo Line.

Table 3-13

CONGESTION CONDITIONS IN THE DOWNTOWN LA AREA

	AM 6-9 AM	MIDDAY 9 AM-3 PM	PM 3-7 PM	EVENING 7-9 PM	NIGHT 9 PM-3 AM
Average number of trips	186,376	345,517	308,170	47,922	65,600
Average length of trip (miles)	1.13	0.98	1.13	0.85	1.08
Average time per trip (min)	3.08	2.70	3.12	2.17	3.05
Estimated uncongested time per trip (min)	2.78	2.41	2.78	2.10	2.67
Average delay per trip (min)	**0.30**	**0.29**	**0.34**	**0.08**	**0.38**
Total vehicle hours of delay	**924**	**1,661**	**1,740**	**61**	**415**
Delay % increase (in trip time)	**11%**	**12%**	**12%**	**4%**	**14%**
Annual person hours of delay (weekdays only)	**1,560,085**				

Sources: INRIX (average speed data), SCAG 2012 RTP Model (average number of trips, average length of trips), AECOM calculations.

2. AREA CHARGE

100% of total vehicle-based trips in the area

Same as cordon charge.

Same as cordon charge.

High potential for trip suppression and re-organization (especially discretionary trips) to limit number of trips within the area.

Same as cordon charge.

Same as cordon charge for trips starting and/or ending outside the area (96%).
High potential for modal shift to active transportation for trips done within the area over short distances.

Same as cordon charge for trips starting and/or ending outside the area (96%).
Potential for modal switch to public transit (bus) for local trips (4%) if area charge is higher than bus fare.

Table 3-15

ANALYSIS OF ECONOMIC POTENTIAL FOR THE WESTSIDE (CORDON) AREA BY TYPE OF PRICING MECHANISM

	1. CORDON CHARGE
Type of Impact	**Rationale**
Potential for Improved Mobility and Transportation User Experience?	
Travel time savings for road users?	Reduction of VMT = reduction of congestion = better avg. speed during peak periods in zone
Safety benefits?	Reduction in VMT x accident risks x impact of accidents = potential safety benefits
Automobile operating costs savings?	Reduction in VMT x avg. auto operating cost per mile = automobile operating cost savings
Active transportation benefits and costs?	Better and safer transportation conditions for local commuters using active transportation due to reduced congestion.
Potential for Improved Environmental Outcomes?	
Improved local air quality impacts?	Reduction in VMT x avg. air quality impact per VMT = improved local air quality
Lower noise and vibration impacts?	Reduction in VMT x avg. noise impacts per VMT = lower noise and vibration impacts
Reduced greenhouse gas emissions?	Reduction in VMT x emissions per VMT = GHG emissions reduction
Substantial Capital and Operating Costs Required for Implementation?	
Substantial capital expenditures?	Depends on number of control points and envisaged technology.
Substantial operating costs?	Operating costs include labor costs, technology for monitoring, enforcement and payment.

	2. AREA CHARGE	
Potential?	**Rationale**	**Potential?**
YES	Same as cordon charge.	YES
YES	Same as cordon charge.	YES
YES	Same as cordon charge.	YES
YES	Same as cordon charge.	YES
YES	Same as cordon charge.	YES
YES	Same as cordon charge.	YES
YES	Same as cordon charge.	YES
YES	Potentially more expensive than cordon charge but also depends on envisaged technology.	YES
YES	Potentially more expensive than cordon charge but also depends on costs including labor costs, technology for monitoring, enforcement and payment.	YES

Table 3-16

POTENTIAL FATAL FLAWS ANALYSIS FOR THE WESTSIDE (CORDON) AREA BY TYPE OF PRICING MECHANISM

	1. CORDON CHARGE		2. AREA CHARGE	
Improved Economic Competitiveness				
Positive Impacts	**Relevance**		**Relevance**	
Expansion of high-skill labor pool available to area's employers	Yes, due to reduced congestion and reduced travel time to locations within zone.		Yes, same as cordon charge.	
Higher business productivity	Yes, business travel time savings which have higher monetary values than commuter time savings.		Yes, same as cordon charge.	
Enhanced place-making	Yes, due to less vehicular traffic and improved local air quality, which are likely to result in a more attractive environment for walking, cycling and related activities.		Yes, same as cordon charge.	
Adverse Impacts	**Relevance**	**Potential Fatal Flaw?**	**Relevance**	**Potential Fatal Flaw?**
Diversion of jobs	Potentially relevant only if the costs borne by employers (e.g. any portion of the congestion charge assumed by the employers as business expense or in the form of higher labor costs) are greater than the benefits (e.g. business travel time savings, increased labor supply, and possibly lower labor costs).	NO	Potentially, same as cordon charge.	NO
Higher labor costs and reduced competitiveness of jobs within the zone	Relevant only if the additional costs borne by employers are not fully offset by the benefits.	NO	Same as cordon charge.	NO
Higher operational costs and reduced competitiveness of companies within the zone	Not relevant	NO	Relevant especially if additional cost of each trip (deliveries or trips for work purposes) is not offset by benefit of time gain.	NO
POTENTIAL FATAL FLAW?	**Cordon Charge**	**NO**	**Area Charge**	**NO**

	1. CORDON CHARGE		2. AREA CHARGE	
Improved Livability				
Positive Impacts	**Relevance**		**Relevance**	
General livability improvement in terms of noise, air quality, safety	Due to reduced congestion inside the zone.		Same as cordon charge.	
Increase in residential land value inside the zone	Caused by improved livability and potential increase in demand to live inside the area to avoid having to cross the charge zone.		Similar to cordon charge, but increase in land values may be smaller.	
Adverse Impacts	**Relevance**	**Potential Fatal Flaw?**	**Relevance**	**Potential Fatal Flaw?**
Potential increase in traffic in arterial roads outside the cordon	Due in part to drivers changing their trip patterns to avoid congestion zone.	NO	Same as cordon charge.	NO
May decrease residential land value just outside the zone	Would be caused by a massive move of residents inside the zone to avoid charge, or general decrease in livability due to increased traffic.	NO	Not relevant since trips within the area are also charged.	NO
POTENTIAL FATAL FLAW?	**Cordon Charge**	**NO**	**Area Charge**	**NO**
Technical Implementation Track Record				
Positive Impacts	**Relevance**		**Relevance**	
Similar system successfully implemented in other cities	Stockholm provides a good example and reference in terms of technical implementation.		London provides a good example and reference in terms of technical implementation.	
Adverse Impacts	Relevance	Potential Fatal Flaw?	Relevance	Potential Fatal Flaw?
Absence of examples in cities in a similar jurisdiction and with similar driving/living habits	Relevant if differences in jurisdiction and driving habits present a problem at the technical level.	NO	Same as cordon charge.	NO
POTENTIAL FATAL FLAW?	**Cordon Charge**	**NO**	**Area Charge**	**NO**

Table 3-16

POTENTIAL FATAL FLAWS ANALYSIS FOR THE WESTSIDE (CORDON) AREA BY TYPE OF PRICING MECHANISM *(CONTINUED)*

	1. CORDON CHARGE		2. AREA CHARGE	
Social and Public Acceptance Considerations				
Positive Impacts	**Relevance**	**Relevance**		
Potential support and favorable perception by low to average income households	Only if better public transportation alternatives are offered (e.g. increased investments in public transportation)	Same as cordon charge.		
Adverse Impacts	Relevance	Potential Fatal Flaw?	Relevance	Potential Fatal Flaw?
Potential lack of support or active opposition from key stakeholders	For example, residents outside the cordon perimeter.	Maybe	For example, residents both outside and inside the charge area.	Maybe
Potential lack of support by low to average income households	Only if no other transportation alternative is offered.	NO	Same as cordon charge.	NO
POTENTIAL FATAL FLAW?	**Cordon Charge**	**NO**	**Area Charge**	**NO**

Table 3-17

POTENTIAL FOR BEHAVIORAL CHANGE IN THE WESTSIDE (PARCEL) AREA BY TYPE OF PRICING MECHANISM

POTENTIAL BEHAVIORAL CHANGE:	3. PARKING LEVY	4. PARKING SALES TAX	5. VARIABLE PARKING PRICING
Affected population	Owners of privately-owned parking lots and vehicles that park there once tax is passed on to end user: • Unknown portion of total potential of 38% of trips • 62% pass through the area and not affected	Vehicles parking off-street in commercial or municipally-owned parking lots (such as hospitals, hotels or universities): • Unknown portion of total potential of 38% of trips • 62% pass through the area and not affected	Vehicles parking on-street and in municipally-owned parking lots: • Unknown portion of total potential of 38% of trips • 62% pass through the area and not affected
Trip diversion	No potential in the short-term. Very limited potential diversion in the medium-term only for travelers who can change destination to lower parking cost. No potential for workers and commuters passing through the area (unless employers change location of jobs).	Very limited potential trip diversion only for travelers who can change destination to lower parking cost. No trip diversion potential for workers and commuters passing through the area.	Same as parking sales tax.
Change in time-of-day travel	No potential change in time of day travel.	No potential change in time of day travel.	Some potential change in time of day travel if pricing is lower at certain hours.
Trip suppression and re-organization	No potential of trip suppression and re-organization in the short-term with limited potential in the mid-term.	Potential for trip suppression and re-organization	Same as parking sales tax.
Carpooling	No potential in the short-term.	Some potential, especially for workers.	Same as parking sales tax.
Modal shift to active transportation	No potential modal shift to active transportation in the short-term. Some potential in the mid-term provided appropriate facilities are made available (e.g. safe reserved bike lanes).	Some potential modal shift to active transportation provided appropriate facilities are made available (e.g. safe reserved bike lanes).	Same as parking sales tax.
Modal switch to public transit	No potential modal switch in the short-term and potential in the mid-term may be limited.	Potential modal switch may be limited.	Same as parking sales tax.

Table 3-18

ANALYSIS OF ECONOMIC POTENTIAL FOR THE WESTSIDE (PARCEL) AREA BY TYPE OF PRICING MECHANISM

	4. PARKING SALES TAX	5. VARIABLE PARKING PRICING
Type of Impact	**Rationale**	**Potential?**
Potential for Improved Mobility and Transportation User Experience?		
Travel time savings for road users?	Small reduction of VMT = small reduction of congestion = slightly better avg. speed during peak periods in zone.	YES (limited)
Safety benefits?	Small reduction in VMT x accident risks x impact of accidents = small potential safety benefits	YES (limited)
Automobile operating costs savings?	Small reduction in VMT x avg. auto operating cost per mile = small automobile operating cost savings	YES (limited)
Active transportation benefits and costs?	Slightly better and safer transportation conditions for local commuters using active transportation due to reduced congestion.	YES (limited)
Potential for Improved Environmental Outcomes?		
Improved local air quality impacts?	Small reduction in VMT x avg. air quality impact per VMT = slightly improved local air quality	YES (limited)
Lower noise and vibration impacts?	Small reduction in VMT x avg. noise impacts per VMT = slightly lower noise and vibration impacts	YES (limited)
Reduced greenhouse gas emissions?	Small reduction in VMT x emissions per VMT = GHG emissions reduction	YES (limited)
Substantial Capital and Operating Costs Required for Implementation?		
Substantial capital expenditures?	Minimal capital expenditures, tax applied as a sales tax.	NO
Substantial operating costs?	Operating costs include monitoring and management of collected tax.	YES (limited)

Rationale	Potential?
Same as parking sales tax.	YES (limited)
Same as parking sales tax.	YES (limited)
Same as parking sales tax.	YES (limited)
Same as parking sales tax.	YES (limited)
Same as parking sales tax.	YES (limited)
Same as parking sales tax.	YES (limited)
Same as parking sales tax.	YES (limited)
Depends on the technology in place for public parking and on-street meters and its flexibility to integrate variable pricing.	YES (limited)
Operating costs include labor costs, monitoring and enforcement.	YES (limited)

Short list of Alternatives

Four pricing mechanisms in two areas passed the first and second stage screening evaluation and consist of the following: (1) Westside (Cordon) - Cordon Charge; (2) Westside (Cordon) - Area Charge; (3) LA LIVE - Parking Sales Tax; and, (4) LA LIVE - Ticket Surcharge.

ANALYSIS OF BASE ALTERNATIVES

The Westside (Cordon) and LA LIVE areas experience the greatest relative increase in delay from congestion, and therefore have the greatest potential to benefit from a decongestion program. These areas each had two pricing mechanisms which passed the first and second stage screening and therefore advanced to the short list of alternatives, but only one mechanism for each area was advanced to form the two base alternatives (Westside Cordon Charge and LA LIVE Parking Surcharge). On the Westside, the cordon charge was advanced to a base alternative for further project definition and analysis due to less operating complexity and fewer expected capital and operating costs than the area charge mechanism. For the LA LIVE area, congestion is concentrated around sporting or entertainment events and often at night. A ticket surcharge would be easily implemented but potential for behavior change to shift time-of-day or mode of travel was less than a cost associated with parking. For the LA LIVE base alternative, a project definition was therefore developed that is a slight variation on a parking sales tax. This variable parking price base alternative is expected to yield maximum travel behavior changes when congestion is worst for this area.

Westside Cordon Base Alternative Analysis

The analysis within this section presents the demographic and geographic characteristics of trips to the Westside area, depicted in Figure 3-5. The area under analysis is generally bounded by Wilshire Boulevard on the north, I-405 on the east, I-10 on the south, and 20th Street on the west.

Travel Markets and Analysis

To help understand the geographic distribution of trips to the Westside study area, the primary geographic regions sending trips into the area were clustered into coherent groupings with similar socioeconomic characteristics: cordon study area, Brentwood/Bel Air/Westwood, West Los Angeles Area, West Central Los Angeles, San Fernando Valley, South Bay, Downtown LA.

Because different types of trips have different characteristics and are more or less susceptible to incentives to alter their mode, time, or destination, trips to the study areas were also analyzed according to the following characteristics:

- Peak or off-peak: Peak trips occur during the traditional AM and PM commute periods (6-9 AM and 3-7 PM), while off-peak trips occur during any other time of day.
- Work or non-work trips: Work trips are trips from home to work, or the reverse. All other trips are non-work trips.
- Drive alone, shared ride, or transit: Drive alone trips are made by a single driver unaccompanied in a private automobile. Shared ride trips are made by a driver accompanied by one or more passengers in a private automobile. Transit trips are trips made on a public transit vehicle (bus or rail).
- To the cordon or intra-cordon: Trips to the cordon are trips with origin outside the cordon area and a destination inside. Intra-cordon trips have both an origin and destination inside the potential cordon area.
- Through trips: Through trips are trips that originate outside the cordon area, travel through the cordon area, and have a destination outside the cordon area.

Table 3-19

POTENTIAL FOR BEHAVIORAL CHANGE IN THE LA LIVE AREA BY TYPE OF PRICING MECHANISM

POTENTIAL BEHAVIORAL CHANGE:	6. PARKING SALES TAX	7. TICKET SURCHARGE
Affected population	Vehicles parking in off-street municipally-owned or commercial parking lots (arenas, hotels or theaters): Unknown portion of total potential of 37% of trips 63% pass through the area and are not affected	Every person attending an event in the area that is submitted to the surcharge. Proportion of trips unknown
Trip diversion	Very limited potential trip diversion only for travelers who can change destination to lower parking cost. No trip diversion potential for workers, people attending events and commuters passing through the area.	No potential for trip diversion (no incentive since surcharge is paid anyways).
Change in time-of-day travel	No potential change in time-of-day of travel.	Same as parking sales tax.
Trip suppression and re-organization	Potential for trip suppression and re-organization.	No potential for trip suppression and re-organization (no incentive since surcharge is paid anyways).
Carpooling	Potential for carpooling, especially for workers and people attending events.	No potential for carpooling (no incentive since surcharge is paid anyways).
Modal shift to active transportation	Potential modal shift to active transportation provided appropriate facilities are made available (e.g. safe reserved bike lanes).	No potential for modal shift to active transportation (no incentive since surcharge is paid anyways).
Modal switch to public transit	Potential modal switch: 20% transit mode share for trips ending or starting in area so room for more as public transit under utilized 10.7% of workers with jobs located in the zone are close to Metro Rail (within 0.5 miles) and could easily switch modes to Metro Rail. Over 68% of workers with jobs located in the zone live close to a Metrolink station (within 7.5 miles).	Significant potential modal switch only if event ticket becomes a transit pass.

Table 3-20

ANALYSIS OF ECONOMIC POTENTIAL FOR THE LA LIVE AREA BY TYPE OF PRICING MECHANISM

	6. PARKING SALES TAX		7. TICKET SURCHARGE	
Type of Impact	**Rationale**	**Potential?**	**Rationale**	**Potential?**
Potential for Improved Mobility and Transportation User Experience?				
Travel time savings for road users?	Reduction of VMT = reduction of congestion = better average speed during peaks in zone (e.g., events)	YES	Same as parking sales tax.	YES
Safety benefits?	Reduction in VMT x accident risks x impact of accidents = potential safety benefits	YES	Same as parking sales tax.	YES
Automobile operating costs savings?	Reduction in VMT x avg. auto operating cost per mile = automobile operating cost savings	YES	Same as parking sales tax.	YES
Active transportation benefits and costs?	Better and safer transportation conditions for local commuters using active transportation due to reduced congestion.	YES (limited)	Same as parking sales tax.	YES (limited)
Potential for Improved Environmental Outcomes?				
Improved local air quality impacts?	Reduction in VMT x avg. air quality impact per VMT = improved local air quality	YES	Same as parking sales tax.	YES
Lower noise and vibration impacts?	Reduction in VMT x avg. noise impacts per VMT = lower noise and vibration impacts	YES	Same as parking sales tax.	YES
Reduced greenhouse gas emissions?	Reduction in VMT x emissions per VMT = GHG emissions reduction	YES	Same as parking sales tax.	YES
Substantial Capital and Operating Costs Required for Implementation?				
Substantial capital expenditures?	Minimal capital expenditure as tax is applied as a sales tax.	NO	Minimal capital expenditure as surcharge is applied in the same way as a sales tax.	NO
Substantial operating costs?	Operating costs include monitoring and management of collected tax.	YES (Limited)	Operating costs include management of collected surcharge.	YES (Limited)

Table 3-21

POTENTIAL FATAL FLAWS ANALYSIS FOR THE LA LIVE AREA BY TYPE OF PRICING MECHANISM

	6. PARKING SALES TAX
Improved Economic Competitiveness	
Positive Impacts	**Relevance**
Higher business productivity	Yes, business travel time savings which have higher monetary values than commuter time savings.
Enhanced place-making	Yes, due to less vehicular traffic and improved local air quality, which are likely to result in a more attractive environment for walking, cycling and related activities.
Adverse Impacts	**Relevance**
Diversion of events	Not relevant
Diversion of parking clients	Relevant if parking lots just outside the area are close enough to events
Inequity for event attendees who do not use vehicle to attend event.	Not relevant
Adverse Impacts	**Relevance**
Lower attendance to events	Relevant if modal switch is impossible and the extra cost of parking is not offset by benefits of reduced congestion.
Higher labor costs and reduced competitiveness of jobs within the zone	Relevant for workers without access to parking by employers and only if the additional costs borne by employers are not fully offset by the benefits.
POTENTIAL FATAL FLAW?	**Parking Sales Tax**
Improved Livability	
Positive Impacts	**Relevance**
General livability improvement in terms of noise, air quality, safety	Due to reduced congestion inside the zone.
Adverse Impacts	**Relevance**
None identified	
POTENTIAL FATAL FLAW?	**Parking Sales Tax**

7. TICKET SURCHARGE

Relevance

Not relevant

Same as parking sales tax, only in time periods of events.

Potential Fatal Flaw?	**Relevance**	**Potential Fatal Flaw?**
NO	Relevant if event organizers relocate events to avoid surcharge.	NO
NO	Not relevant	NO
NO	Relevant if the surcharge collected is not used in a way that benefits all attendees of the events.	NO
Potential Fatal Flaw?	**Relevance**	**Potential Fatal Flaw?**
NO	Relevant if the surcharge dissuades clients from buying tickets.	NO
NO	Not relevant	NO
NO	**Ticket Surcharge**	**NO**

Relevance

Same as parking sales tax.

Potential Fatal Flaw?	**Relevance**	**Potential Fatal Flaw?**
NO		NO
NO	**Ticket Surcharge**	**NO**

Table 3-21

POTENTIAL FATAL FLAWS ANALYSIS FOR THE LA LIVE AREA BY TYPE OF PRICING MECHANISM *(CONTINUED)*

	6. PARKING SALES TAX
Technical Implementation Track Record	
Positive Impacts	**Relevance**
Easy implementation process	Similar to any sales tax.
Adverse Impacts	**Relevance**
None identified	
POTENTIAL FATAL FLAW?	**Parking Sales Tax**
Social and Public Acceptance Considerations	
Positive Impacts	**Relevance**
Potential support and favorable perception by local community	Especially if revenues generated by tax are in fact used to subsidize transit operations.
Adverse Impacts	**Relevance**
Potential lack of support or active opposition from one or more key stakeholders	For example, owners of parking lots inside the area.
POTENTIAL FATAL FLAW?	**Parking Sales Tax**

7. TICKET SURCHARGE

Relevance		
Similar to any sales tax.		
Potential Fatal Flaw?	**Relevance**	**Potential Fatal Flaw?**
NO		NO
NO	**Ticket Surcharge**	**NO**
Relevance		
Only if revenues generated by surcharge are in fact used to subsidize transit operations.		
Potential Fatal Flaw?	**Relevance**	**Potential Fatal Flaw?**
Maybe	For example, event organizers.	Maybe
NO	**Ticket Surcharge**	**NO**

Table 3-22

POTENTIAL FOR BEHAVIORAL CHANGE IN THE DOWNTOWN LA AREA BY TYPE OF PRICING MECHANISM

POTENTIAL BEHAVIORAL CHANGE:	8. CORDON CHARGE
Affected population	Up to 95% of total vehicle-based trips in the area: • 63% of trips end or start in the area • 32% pass through the area
Trip diversion	Significant potential to divert trips around area: 32% of trips in the zone are pass-through trips; A substantial portion may choose alternate routes to their destinations
Change in time-of-day travel	Potential change if charge is lower in off-peak times (especially for discretionary trips and freight deliveries).
Trip suppression and re-organization	Potential for trip suppression and re-organization (especially discretionary trips)
Carpooling	Potential for increased carpooling to save on fees
Modal shift to active transportation	Potential modal shift to active transportation for workers who live adjacent to the charging zone provided appropriate facilities are made available (e.g. safe reserved bike lanes).
Modal switch to public transit	Potential for modal switch to public transit: • 21% transit mode share for trips ending or starting in area • Only 8.6% of workers with jobs in the zone are close to Metro Rail (within 0.5 miles) and could easily switch modes to Metro Rail. • About 73% of workers with jobs in the zone live close to a Metrolink station (within 7.5 miles) and could easily switch modes. • Only 20.6% of workers with jobs in the zone are high-skilled and potentially less price-sensitive to a charge

9. AREA CHARGE	10. PARKING LEVY	11. VARIABLE PARKING PRICING
100% of total vehicle-based trips in the area.	Owners of privately-owned parking lots and vehicle parking once tax is passed on in the price in the mid-term: • unknown portion of total potential of 68% of trips • 32% pass through the area and are not affected	Vehicles parking on-street and in municipally-owned parking lots: • Unknown portion of total potential of 68% of trips • 32% pass through the area and are not affected
Same as cordon charge.	No potential in the short-term. Very limited potential in the mid-term only for travelers who can change destination to lower parking cost. No potential for workers and commuters passing through.	Very limited potential trip diversion only for travelers who can change destination to lower parking cost. No trip diversion potential for workers and commuters passing through the area.
Same as cordon charge.	No potential change in time of day travel.	Some potential change in time of day travel if pricing is lower at certain hours.
High potential for trip suppression and re-organization (especially discretionary trips) to limit number of trips within the area.	No potential of trip suppression and re-organization in the short-term. Limited potential in the mid-term.	Potential for trip suppression and re-organization.
Same as cordon charge.	No potential for carpooling in the short-term. Limited potential for carpooling in the mid-term, especially for workers who do not have access to free parking by employer.	Limited potential for carpooling, especially for workers who do not have access to free parking by employer.
Same as cordon charge for trips starting or/and ending outside the area (96%). High potential for modal shift to active transportation for trips done within the area on short distances.	No potential modal shift to active transportation in the short-term. Some potential in the mid-term if appropriate facilities are made available (e.g. safe reserved bike lanes). High potential for modal shift to active transportation for trips done within the area on short distances.	Some potential modal shift to active transportation provided appropriate facilities are made available (e.g. safe reserved bike lanes). High potential for modal shift to active transportation for trips done within the area on short distances.
Same as cordon charge for trips starting or/and ending outside the area (95%). Potential for modal switch to public transit (bus) for local trips (4%) if area charge is higher than bus fare.	No potential modal switch in the short-term. Potential in the mid-term for commuters who do not have access to free parking.	Potential for workers who do not have access to free parking by employers.

Work Trips

As shown in Figure 3-6, the greatest sources of work trips to the Westside cordon study area are the adjacent areas in Brentwood/Bel Air/Westwood and West LA. Significant numbers of trips also come from the West Central LA area, the South Bay (particularly along the I-405 corridor), and the San Fernando Valley. Downtown LA and other areas farther away do not appear to be as significant sources of trips to this area.

As shown in Figure 3-7, within work trips, peak drive alone follows a similar pattern as overall work trips. However, as shown in Figure 3-8, peak transit trips show a different pattern, with very few trips from Brentwood/Bel Air/Westwood or the San Fernando Valley. This is likely the result of a combination of factors: household income, as well as limited transit service from the San Fernando Valley to the study area. Instead, transit work trips origins extend all the way to Downtown LA and south into Culver City.

To examine the patterns of transit trips further, an analysis of the transit mode share of trips to the Westside area was conducted. Two corridors were defined: a “north-south” corridor roughly parallel to I-405 from the San Fernando Valley to the South Bay, and an “east-west” corridor from Downtown Santa Monica through Hollywood to Downtown Los Angeles. Neither corridor included the potential cordon area itself. Table 3-24 presents the transit mode share for trips in these two corridors to the Westside area and shows the transit mode share for east-west trips is two to three times as high as that for north-south trips. For east-west work trips during the peak, the transit mode share is as high as 24.1%.

Non-Work Trips

Peak non-work trips to the Westside study area come from a more circumscribed area. This is consistent with shorter average trip lengths for non-work trips compared to work trips. Relatively few non-work trips come from the San Fernando Valley or the South Bay. Non-work trips are much more likely to be shared ride than work trips. There are very few peak non-work transit trips to the area. The characteristics of off-peak non-work trips are very similar to those of peak non-work trips, except that there are relatively few off-peak non-work transit trips to the area.

Through Trips

Through trips include those trips that both originate and conclude outside the Westside area but use the local roads within the area during their trips. A majority of these trips have origins and/or destinations near the cordon study area, many of them in other parts of Santa Monica or West Los Angeles, including Westwood. It was estimated that 46% of vehicle trips are through trips using the local roadways within the Westside area are through trips.

Table 3-25 presents a qualitative summary of the relative significance of different types of trips from the various surrounding geographic areas with regard to travel within the potential cordon area.

As shown in Table 3-25, both work and non-work trips are significant contributors of trips to the area. Areas close to the potential pilot program contribute both types of trips, while more distant areas such as the San Fernando Valley or the South Bay tend to contribute primarily work trips.

When comparing the geographic distribution of the origins of trips to the study area against household incomes and transit services in each of the areas, several themes emerge. First, trips from the west and north (excluding the San Fernando Valley) tend to come from areas with higher household incomes and poorer quality transit. Second, trips from the

Table 3-23

ECONOMIC POTENTIAL ANALYSIS FOR THE DO

Type of Impact
Potential for Improved Mobility and Transportation User
Travel time savings for road users?
Safety benefits?
Automobile operating costs savings?
Active transportation benefits and costs?
Potential for Improved Environmental Outcomes?
Improved local air quality impacts?
Lower noise and vibration impacts?
Reduced greenhouse gas emissions?
Substantial Capital and Operating Costs Required for I
Substantial capital expenditures?
Substantial operating costs?

WNTOWN LA AREA BY TYPE OF PRICING MECHANISM

8. CORDON CHARGE	9. AREA CHARGE	11. VARIABLE PARKING PRICING			
Rationale	**Potential?**		**Potential?**	**Rationale**	**Potential?**
Experience?					
Small reduction of VMT = small reduction of congestion = Slightly better avg. speed during peak periods in zone.	YES (limited)	Same as cordon charge	YES (limited)	Same as cordon charge	YES (limited)
Small reduction in VMT x accident risks x impact of accidents = small potential safety benefits	YES (limited)	Same as cordon charge	YES (limited)	Same as cordon charge	YES (limited)
Small reduction in VMT x average auto operating cost per mile = Small automobile operating cost savings	YES (limited)	Same as cordon charge	YES (limited)	Same as cordon charge	YES (limited)
Slightly better and safer conditions for local commuters using active transportation due to reduced congestion.	YES (limited)	Same as cordon charge	YES (limited)	Same as cordon charge	YES (limited)
Small reduction in VMT x avg. air quality impact per VMT = slightly improved local air quality	YES (limited)	Same as cordon charge	YES (limited)	Same as cordon charge	YES (limited)
Small reduction in VMT x avg. noise impacts per VMT = slightly lower noise and vibration impacts	YES (limited)	Same as cordon charge	YES (limited)	Same as cordon charge	YES (limited)
Small reduction in VMT x emissions per VMT = GHG emissions reduction	YES (limited)	Same as cordon charge	YES (limited)	Same as cordon charge	YES (limited)
nplementation?					
Depends on number of control points and envisaged technology.	YES	Potentially more expensive than cordon charge but also depends on envisaged technology.	YES	Depends on technology in place for public parking and on-street meters and flexibility to integrate variable pricing.	YES (limited)
Operating costs include labor costs, technology for monitoring, enforcement and payment.	YES	Potentially more expensive than cordon but depends on costs for labor, monitoring technology, payment and enforcement.	YES	Operating costs include labor costs, monitoring and enforcement.	YES (limited)

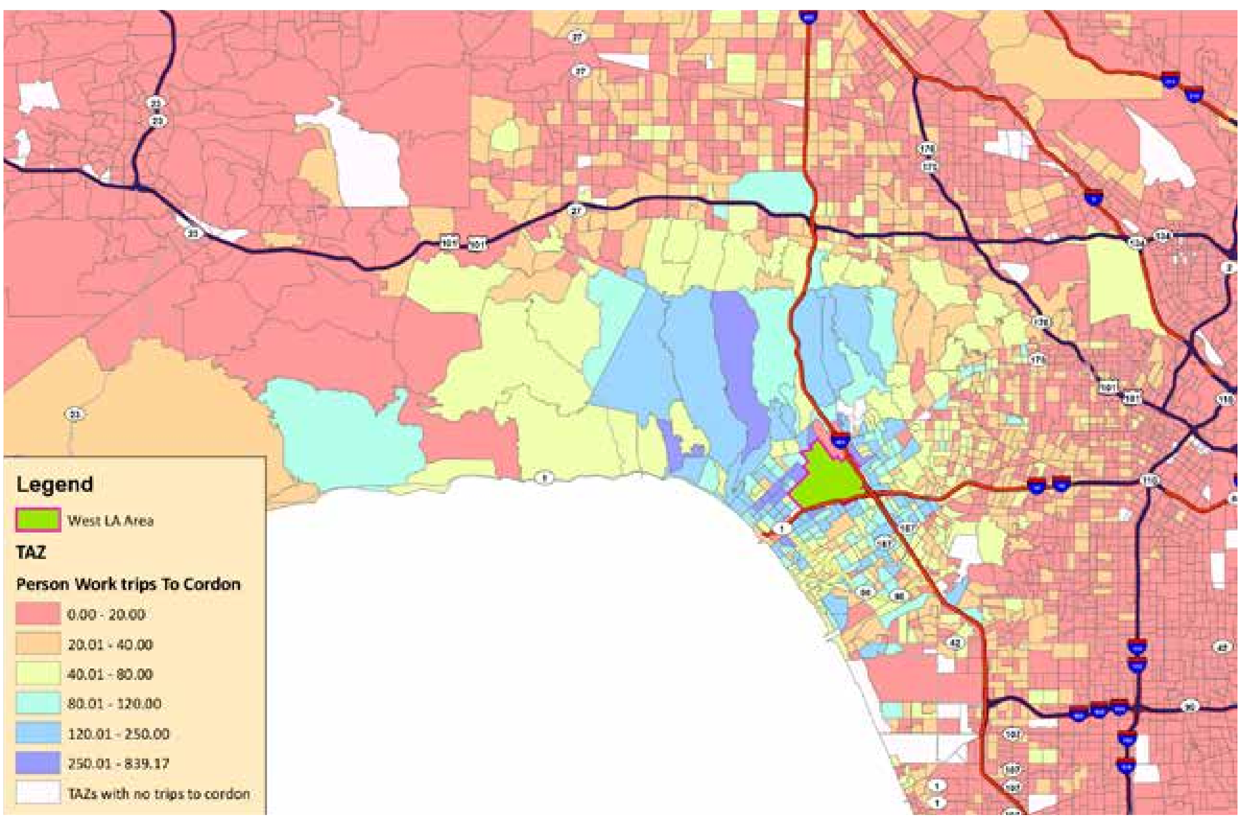
Figure 3-5

WESTSIDE CORDON BOUNDARIES

Note: Boundaries shown are for modeling purposes only during the screening process

Figure 3-6

2008 PERSON WORK TRIPS TO THE WESTSIDE AREA



Source: SCAG 2012 RTP Model

San Fernando Valley come from a broad area with a mix of household incomes and poor quality transit to the study areas. Third, trips from the east tend to come from areas with lower household incomes and access to higher quality transit, at least along the main corridors. Fourth, trips from the south tend to come from areas with lower household incomes and without access to high quality transit to the study areas. Taken together, these observations suggest that, in order to facilitate mode shift, the project needs to provide the following elements:

- Better mobility options (transit, walking, biking) inside the potential cordon areas
- Better access to transit for trips from the south
- Better "first-mile" options for all transit users

A transit option for the San Fernando Valley, possibly including a park-and-ride type of service because of the distributed nature of trip origins from this area

The breakdown of trip purposes to the area tells a more complex story. Even during the peak periods, the majority of trips to the study area are non-work trips. Given this, a pricing concept that targets only work trips will be limited in effectiveness. In fact, work trips may be the most difficult trips to change: they may have a higher value of time associated with them, and many employees are not able to shift their work hours. Some work trips may be amenable to being made by transit, if transit is made relatively more attractive compared to automobile use. The analysis of "through trips" is revealing in that these trips appear not to be long-distance trips, but primarily fairly local. The origins and destinations of most of these trips are in adjacent areas.

All of the foregoing leads to the conclusion that no single category of trip is the cause of congestion in this area, so targeting one type of trip will likely not achieve significant congestion reduction. Since all sorts of trips are contributing to congestion, an effective program must provide an incentive to almost all trips to some extent. The goal of a potential program should be to move as many trips of any sort out of the peak period as possible, regardless of what trip type.

Improvements to transit service that are recently constructed (the extension of the Expo Line and the Wilshire Boulevard Bus Rapid Transit) provide more high-quality transit options for the existing east-west transit market. To be successful, a potential project should build on existing plans by providing ways for people to get to and from these transit services. Existing transit mode share for north-south trips is quite small, so it will be important to investigate whether it is possible to serve those markets. Serving the South Bay may be possible via a high-quality transit service using I-405 or SR 1 (Lincoln Boulevard and Pacific Coast Highway). Serving the San Fernando Valley would be more challenging because of the geographic challenge of the Sepulveda Pass, but also because trip origins are more diverse in the Valley, meaning that aggregating transit trip ends through the use of a park-and-ride service may be required to make such an idea successful.

Design of Alternative

The intent of the Westside Cordon base alternative is to reduce peak period automobile travel into the potential cordon area. No one type of trip (e.g. work trips or through trips) constitutes "the problem," in that congestion within the area results from the cumulative impact of many different types of trips, with no one outweighing the others. Therefore, the fundamental design of this alternative is to encourage many different types of trips to shift time (away from the peaks) or shift mode (away from the private automobile). Taking these considerations into account, the Westside Cordon base alternative used the characteristics below for initial modeling purposes, but continued to evolve and be refined as the study progressed into the next stage of evaluation.

Type of Charging: The pricing approach adopted was a cordon-based approach. Drivers would pay only when entering the cordon area. Trips originating in the cordon area are not charged, whether they stay in the area or leave.

HOV Policy & Exempt Vehicles: The Westside Cordon base alternative did not assume a discount or exemption based on vehicle occupancy. There is a natural discount per person on shared ride vehicles as driving costs are split between all passengers, but more significant discounts could be considered as a future policy alternative to further incentivize carpooling (this is discussed in Section 4.4). Hybrid, electric and alternative fuel vehicles likewise were not assumed to qualify for a discount in the base alternative. Publicly-operated vehicles such as buses and emergency services would not be required to pay, and any vehicle exempt from payment of tolls in the State of California by law would also not be required to pay.

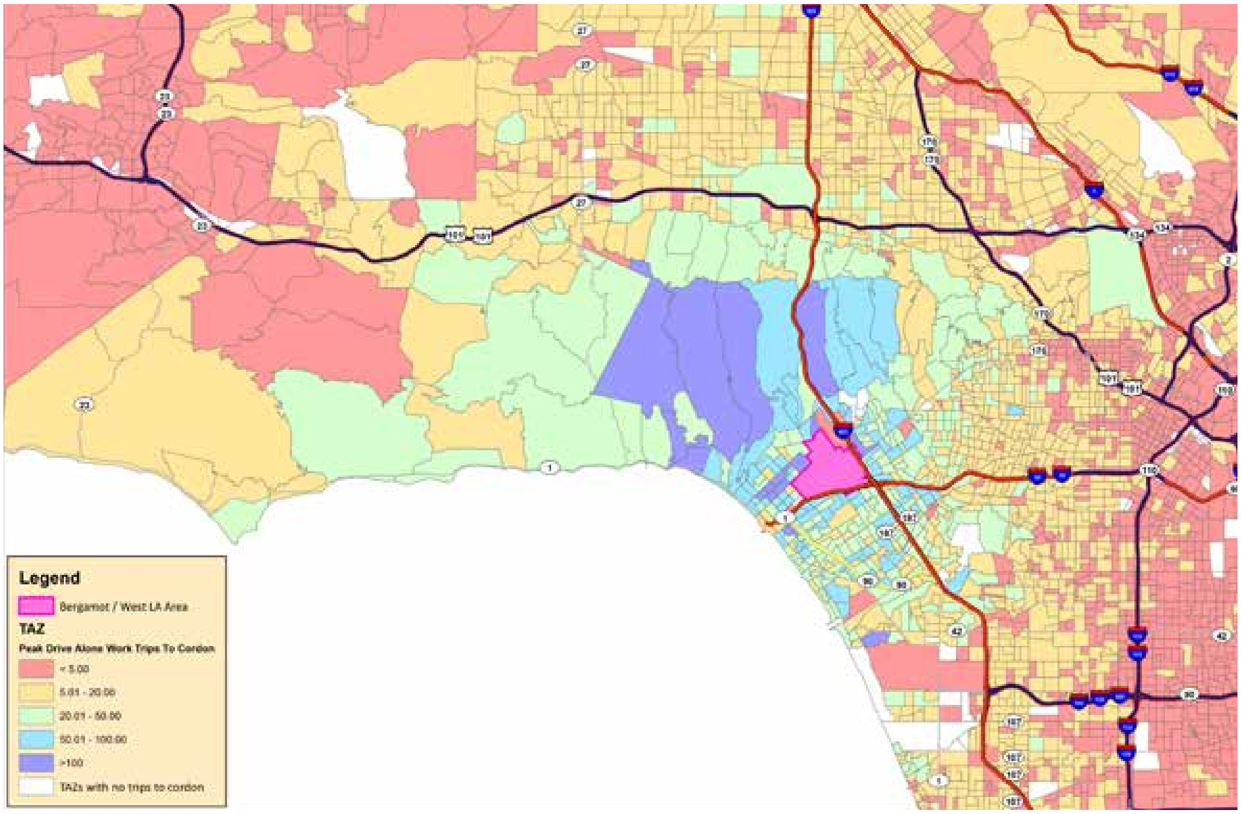
Resident Discounts: Residents living within the cordon area were assumed to be provided a substantial discount off the cordon charge. Given the earlier analysis of the multiple types of trips contributing to area's congestion, it would be desirable to incentivize residents to shift the modes or times of their trips. While the simplest option would be to provide residents with a 100% discount, it would not provide an incentive to residents and therefore a lesser discount of 90% was considered. Another option was to provide a monthly non-refundable, non-cumulative credit for each FasTrak® account registered within the boundaries of the charging zone. Residents could in-effect travel free as long as their total number of trips does not exceed the amount of the credit each month. For analysis purposes, a 90% resident discount was assumed.

Hours of Operation and Time-of-Day Pricing: For weekday operations, hours of operations and the peak periods are aligned with travel demand model peak periods:

- AM peak: 6 AM – 9 AM $2-4 charge
- Midday: 9 AM – 3 PM no charge
- PM peak: 3 PM – 7 PM $2-4 charge
- Evening: 7 PM – 9 PM no charge
- Night: 9 PM – 6 AM no charge

Figure 3-7

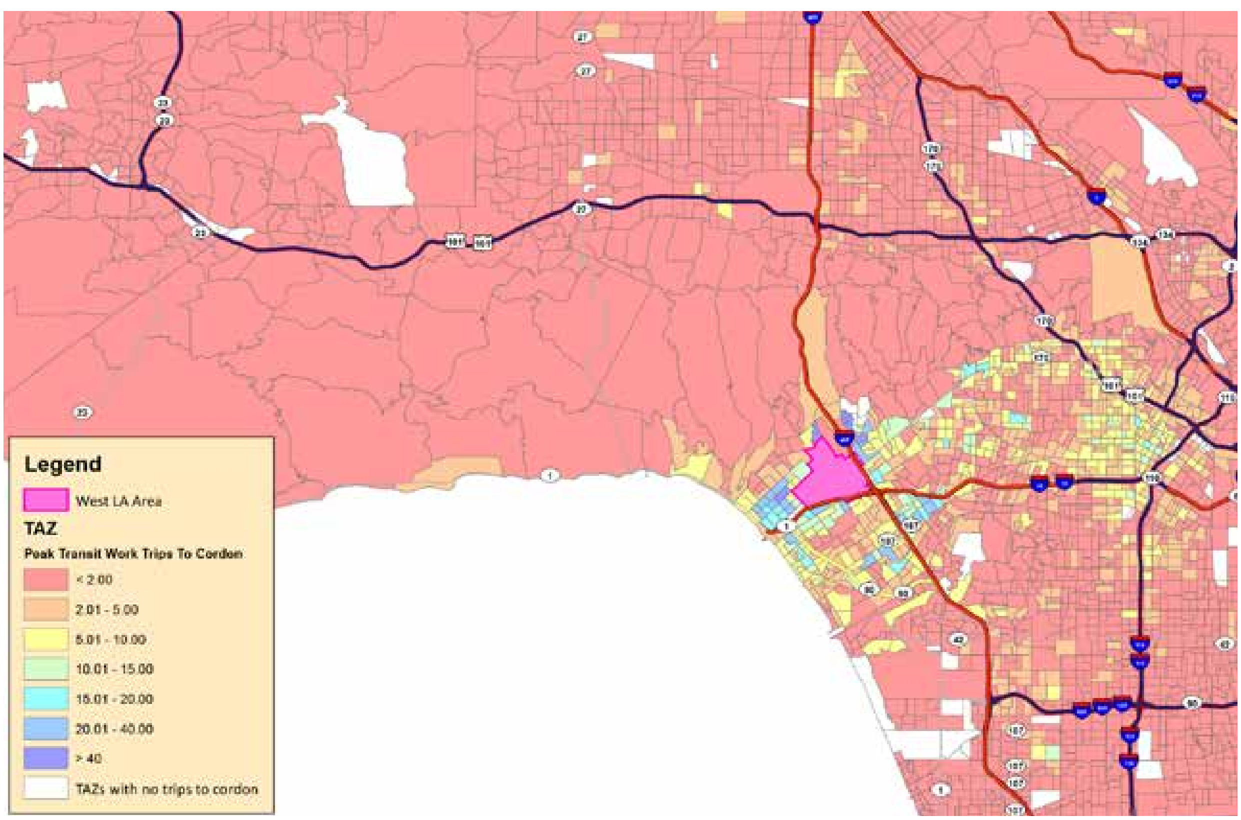
2008 PEAK DRIVE ALONE WORK TRIPS TO THE WESTSIDE AREA



Source: SCAG 2012 RTP Model

Figure 3-8

2008 PEAK TRANSIT WORK TRIPS TO THE WESTSIDE AREA



Source: SCAG 2012 RTP Model

Table 3-24

TRANSIT MODE SHARE FOR NORTH-SOUTH TRIPS COMPARED TO EAST-WEST TRIPS

	PEAK			OFF-PEAK			DAILY		
	WORK	NON-WORK	ALL	WORK	NON-WORK	ALL	WORK	NON-WORK	ALL
North-South	8.7%	2.4%	5.1%	8.3%	2.1%	3.7%	8.5%	2.2%	4.4%
East-West	24.1%	4.6%	10.8%	18.5%	4.4%	7.0%	22.2%	4.5%	9.0%

Source: SCAG 2012 RTP Model

Table 3-25

IMPLICATIONS OF MARKET ANALYSIS FOR WESTSIDE ALTERNATIVES

	BRENTWOOD/ BEL AIR/ WESTWOOD	WEST LOS ANGELES	WEST CENTRAL LOS ANGELES	SAN FERNANDO VALLEY	SOUTH BAY	DOWNTOWN LOS ANGELES
Work Travel	Significant	Very Sig.	Very Sig.	Significant	Significant	Not Sig.
Non-Work Travel	Significant	Very Sig.	Very Sig.	Not Sig.	Not Sig.	Not Sig.
Travel Time	~15 min	~10 min	~20 min	~40 min	~30 min	~30 min
Transit Share	Very low	Medium	Medium	Very low	Low	Low
Shared Rides	Medium	Medium	Medium	Low	Low	Low

Table 3-26

SUMMARY OF ATTRIBUTES FOR THE WESTSIDE CORDON BASE ALTERNATIVE

ATTRIBUTE	BASE CASE ASSUMPTION
Type of charge	Cordon, pay on entry
Time of charge	AM (6-9AM) and PM (3-7PM) peak periods, weekdays excluding public holidays
Amount of charge	$2 to $4 at peak periods
Exemptions	California toll-exempt vehicles only
Discounts	Residents of cordon area Low-income commuters
Collection technology	FasTrak® supplemented by Automatic License Plate Recognition (ALPR)
ALPR Surcharge	$1 per transaction

The attributes used for initial modeling purposes of the Westside Cordon Base Alternative are summarized in Table 3-26, but continued to evolve and be refined as the study progressed into the next stage of evaluation.

LA LIVE Base Alternative Analysis

The LA LIVE base alternative was developed as an alternative with a smaller challenge in terms of legal, political and public perception issues while retaining the key feature of congestion pricing: to manage congestion by influencing traveler behavior through variable pricing on different days and at different times. Unlike the Westside Cordon alternative, the LA LIVE alternative involves only a single jurisdiction and could be implemented under existing state law. In addition, the public is accustomed to paying for parking, so the charging mechanism is more familiar. This section gives a description of the existing congestion challenge in the LA LIVE area, the parking supply in the area, and the parking demand.

LA LIVE Description and Location

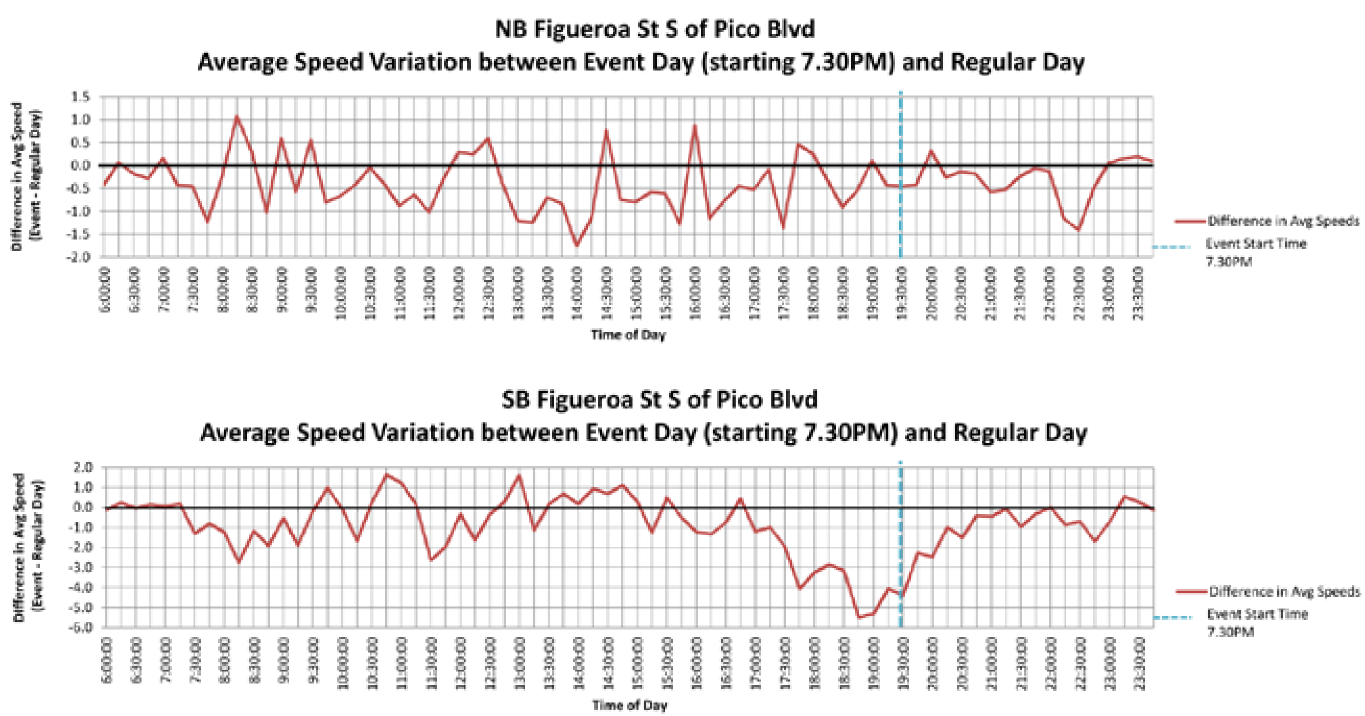
LA LIVE is a major entertainment complex in Downtown Los Angeles. Microsoft Plaza is the central destination in LA LIVE and is a 40,000 square foot open air space that is surrounded by a collection of sports and music venues, night clubs, restaurants, a bowling alley, the Grammy Museum, and Regal movie theaters. The venues in the LA LIVE area host all different kinds of events such as concerts, shows, and sporting events. The largest destinations in LA LIVE and its immediate vicinity are Staples Center and Microsoft Theater. Staples Center is located across 11th Street/Chick Hearn Court to the south of Microsoft Plaza. It is a large multi-purpose sports arena with a capacity of 18,000 – 20,820 depending on the type of event. Staples Center is home to four of Los Angeles' professional sports teams (LA Lakers, Clippers, Kings and Sparks). It also hosts a variety of concerts, shows and boxing competitions. Microsoft Theater is a music and theater venue and has a capacity of 7,100 seats. The high attendance of Staples Center and Microsoft Theater events has caused traffic congestion in the LA LIVE area and also increased parking demand in the area on event days.

Event Trips

Travel to LA LIVE is dominated by automobile trips, but high quality public transit options do exist in the form of the Pico station for the Metro Blue Line and Metro Expo Line, and the nearby 7th Street/Metro Center station which offers direct access to the Metro Red and Purple Lines. Events held at the LA LIVE venues generate a lot of trip demand to Downtown LA, with impacts on congestion levels in the surrounding

Figure 3-9

FIGUEROA STREET AVERAGE SPEED VARIATIONS BETWEEN EVENT DAYS AND REGULAR DAYS



Source: INRIX travel speeds data for March 2012, October 2012, and March 2013.

area. As shown in Figure 3-9, on days when there are events at LA LIVE average speeds are lower than non-event days on arterial streets around the venues.

Parking for Event Attendees

The number of parked cars for an event is directly correlated to the number of vehicles that use the local roadways to travel to that event. These vehicles have a direct impact on traffic and congestion levels around the venue. For a destination that attracts the large number of patrons that LA LIVE and Staples Center does, congestion can back up the regional highway network in addition to the local roadways. Therefore, reducing the number of vehicles coming to the area by implementing a parking charge can provide decongestion benefits.

A site visit was conducted on the evening of February 13, 2014 (a Lakers game day) to gather information on the parking supply in the LA LIVE area. Figure 3-10 shows the parking lots in the LA LIVE area, and corresponding descriptions and capacities are shown in Table 3-27. The field review found that Staples Center lots offer slightly more than 7,000 parking spaces. The adjacent Los Angeles Convention Center lots offer around 5,600 parking spaces, although parking at Convention Center lots appears to only occasionally be open to Staples Center events. There are approximately 30 privately operated parking lots of various sizes within a 7- to 10-minute walking distance of the area. These private lots offer a total of 8,125 parking spaces. In addition, approximately 300 – 400 on-street parking spaces are available in the LA LIVE area. Due to the continuing planned development in Downtown Los Angeles since this site visit, some of these surface parking lots are no longer operational which has limited parking supply in the area.

Event parking pricing at LA LIVE varies by type of event, location of lot and level of security. The privately owned off-site parking lots offer parking at a significantly lower price than Staples Center lots. At the lots operated by LA LIVE and Staples Center, parking costs vary from a minimum of $15 to a maximum of $50 for the flat rate lots. At the privately-operated lots, parking costs vary from a minimum of $5 to a maximum of $20. For events with high popularity such as Lakers games or pop concerts, Staples Center parking lots tend to charge a higher rate than they do for other events. Both Staples Center parking lots and private parking lots in the area already actively apply demand-based pricing, meaning that parking prices are adjusted for events based on expected parking demand.

Demand for parking in the LA LIVE area during and prior to events is driven by people who attend various events hosted in Staples Center, Microsoft Theater and other venues in the area. Looking at the type of events hosted at these venues is essential to understand the potential user markets for parking in the area. For the purposes of the analysis, the type of event held at Staples Center is broken down into categories based on attendance at the event and typical ticket sales: four professional sports team, other sports, pop concerts and family/variety shows. Different types of events tend to lead to different parking rates being charged based on their popularity and user market.

National Basketball Association (NBA) and National Hockey League (NHL) games draw a large crowd so higher parking prices are required to manage demand and can prevent overcrowding in the central area by giving people incentives to choose public transit and more distant parking provision. Microsoft Theater seats 7,100 and holds one of the largest indoor stages in the United States. It has become a venue for several award shows since its opening, including ESPY Awards, American Music Awards, and Primetime Emmy Awards.

The site visit on the evening of February 13, 2014 before a Lakers game confirmed that the underground structures in the Staples Center reached capacity (80% - 95% full). The occupancy of privately operated lots varied drastically from lot to lot with the closest lots to the venue filling up first. Most of the smaller lots were barely used (i.e. less than 40% occupied) on average. A majority of private lots were around half filled.

Variable Parking Price

As shown in Figure 3-11, the parking rate at Staples Center lots is $15 - $25 on a very popular event day (NBA games, NHL games or pop concerts). Events with high attendance (and therefore high parking demand) are major sources for parking revenues. On other slightly less popular event days (family or variety shows), the parking rate is $10 - $15. These rates set a pricing bar for privately owned lots off site, who need to offer a discount to this pricing to compete for patrons. This reflects the lower level of customer convenience, accessibility and security (for the vehicle and the customer).

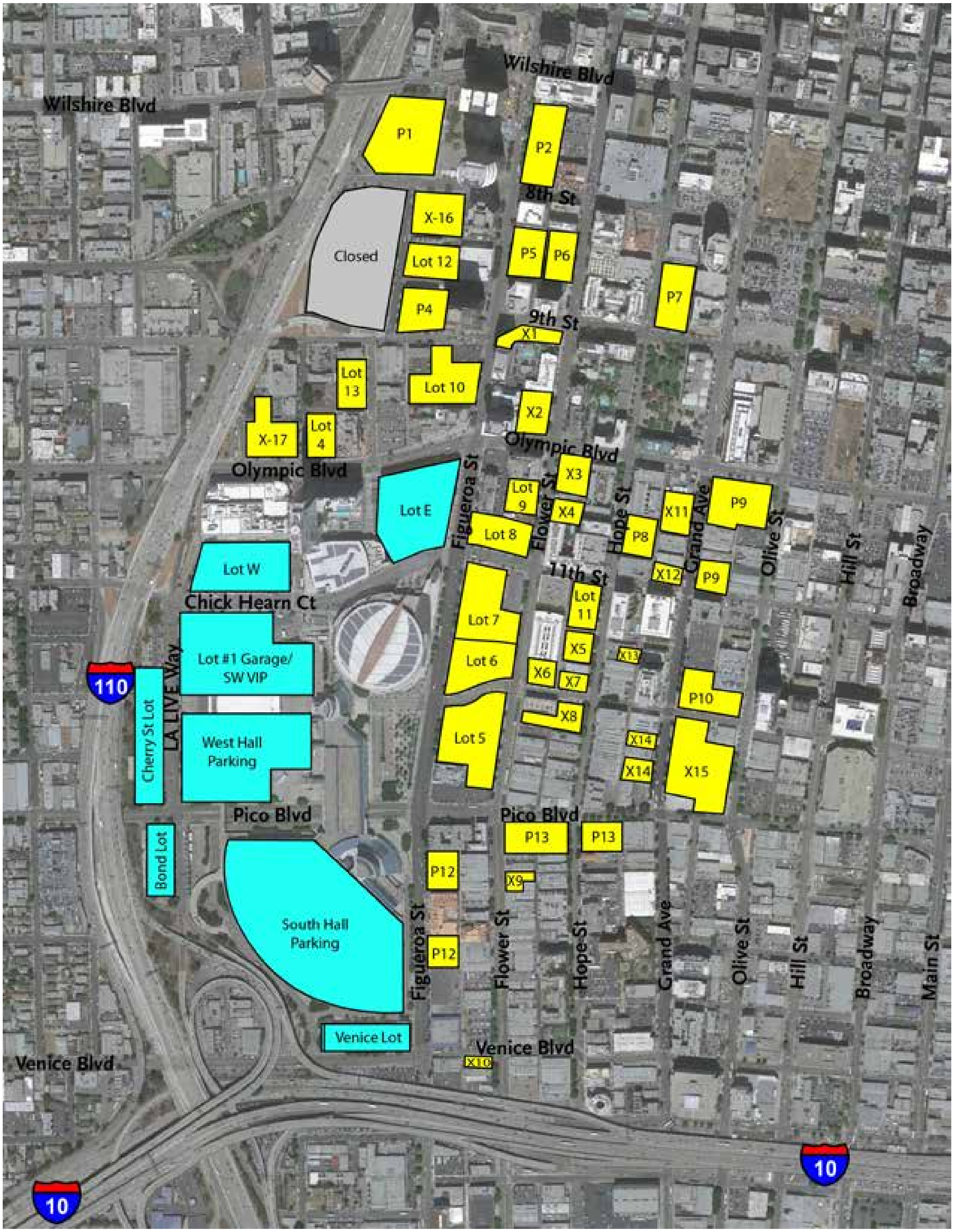
The variable parking option was determined to be more in line with the goals and objectives of the study than the ticket surcharge. A variable parking price dependent on time of arrival before the event start time is expected to have a larger impact on changing travel behavior. Altering time of arrival will help alleviate congestion issues as currently most event patrons arrive within an hour of the event start time, but would be incentivized to arrive earlier. A set ticket surcharge added to the price of every ticket would not help achieve this goal and have minimal behavioral change. Additionally, a ticket surcharge would be applied to every patron instead of just charging vehicles and therefore provide no additional benefit to carpooling to remove vehicles from the road network. As a result, the alternative design is described in the following subsection.

Design of Alternative

Events with high popularity such as Lakers games draw large crowds to the LA LIVE area. More event attendees arrive as the event start time approaches. It is important that any change in pricing policy for events has event attendees as the target market and does not have the effect of discouraging attendance at games to support economic activity in the area around LA LIVE. The proposed method to manage the congestion challenge in the area on event days is to introduce

Figure 3-10

PARKING LOTS IN THE LA LIVE AREA



Source: LA LIVE, AECOM site visit; this information is accurate as of site visit on February 13, 2014.

a variable parking surcharge within a defined boundary. This surcharge would only be enforced on days of events, and the magnitude of the surcharge could vary with the event activity level defined by LA LIVE or the local residents' association to scale based on expected demand and traffic impact.

Until a few hours before the event, pricing would remain unregulated. Beginning three hours before the event, a small surcharge would be imposed, with the amount incrementally increasing as the event start time approached in 30-minute increments up to the start time. The introduction of a variable parking surcharge could help regulate arrival times of patrons on event days and relieve traffic congestion in the area by incentivizing patrons to arrive early or take transit to the area.

Pricing Amounts and Timing

To apply a surcharge that is effective at influencing driver behavior, the surcharge must be a significant share of the event parking fee. While some users are likely to be indifferent to price so long as the tickets are significantly more expensive than parking, this sensitivity to pricing will vary among event attendees and is likely to be strongest among those who use more distant parking lots, with lower prices and greater inconvenience. As shown in Table 3-28, the proposal is to introduce a sliding scale of prices up to the event start time.

The increases are all applied as a share of the Base Price, thereby doubling the price from early arrivers through to people arriving close to the event start time. This pricing schedule need not increase overall parking costs, as parking providers would be free to adjust the "Base Price" based on demand for particular events, and that the Base Price would likely be lower than the existing flat rate prices quoted as parking providers respond to the introduction of this pricing system.

The area included is proposed to be the area encompassed by the I-10, the I-110, Olive Street and Wilshire Boulevard, which corresponds roughly to area where event-specific parking is offered at present, see Figure 3-11.

Technology and Means of Payment

The parking industry in Downtown Los Angeles includes some relatively simple operations that operate purely on a cash basis. To ensure that auditable information is generated for informational and enforcement purposes if needed, all parking operators would be required to operate electronic transaction systems that generate time stamps on arrival data and accept at a minimum credit and ATM cards as payment options.

Table of LA LIVE Base Alternative Attributes

The attributes of the LA LIVE Alternative base case are summarized in Table 3-29 and were used for analysis.

The LA LIVE Alternative was not pursued for further project definition due to stakeholder feedback, but it could be developed at a later time. Additionally, consideration of further assessment of an event-based parking or congestion pricing program may be beneficial, especially as numerous events for the 2028 Olympic Games are expected to take place in or near LA LIVE. There is an opportunity to potentially evaluate this concept or a variation of it in a future study to reduce event-based congestion and align with upcoming event needs.

Refinements of the Westside Cordon Base Alternative

The Westside concept was determined to be the most promising in terms of congestion relief, feasibility, and forecasted revenue. Subsequent refinements to the base alternative described above were made following discussion with stakeholders throughout a collection of meetings and workshops. The primary refinements were related to the boundary limits, fee assessed, and enhancements to existing and planned transit services, as discussed below.

Boundary Refinements

The original boundary was generally bounded by Wilshire Boulevard on the north, I-405 on the east, I-10 on the south, and 20th Street on the west. This area captured a majority of the employment opportunities, especially those concentrated in the Bergamot area and along the Olympic Boulevard and Wilshire Boulevard corridors. Following further analysis and discussion with key stakeholders, the west-northwest boundary limits were expanded from Wilshire Boulevard to Montana Avenue between 20th Street and Centinela Avenue to provide a simpler and more coherent boundary. Fewer bends in the boundary line allow local stakeholders to more easily comprehend this project and therefore a higher rate of public acceptance was anticipated with the simplified boundary.

For purposes of analysis, the north-northeast boundary was extended northerly to Sunset Boulevard between Gretna Green Way and Layton Drive to reduce potential impacts of diverted traffic. Before this boundary extension, analysis using the travel demand model showed the potential for significant diversion of traffic around the proposed charging area and onto Sunset Boulevard, which is itself already heavily congested during peak travel times. Including this approximately one-mile segment of Sunset Boulevard and ¾-mile segment of Barrington Avenue showed the potential to reduce traffic diversion and alleviate traffic congestion along both of these streets, which were identified by focus group participants to be heavily congested.

Fee Refinements

Over the course of the concept development, decongestion fees ranging from $2 to $6 were considered. The estimate of the fee was revised several times in response to analysis using the travel demand model, which provided estimates of the degree of decongestion benefits and the amount of traffic diversion to be expected with various prices, and in response to feedback from the participants in focus groups. The optimal fee is one that provides substantial decongestion benefits without encouraging drivers to divert around the area and cause additional congestion elsewhere. It was also determined it must be priced equal to or higher than transit fares to help encourage mode shifts to transit. Ultimately, for

Table 3-27

PARKING INVENTORY IN THE LA LIVE AREA

PARKING FACILITIES[1]	ESTIMATED CAPACITY	PARKING FACILITIES[1]	ESTIMATED CAPACITY
Olympic East Garage Lot E	750	P7 N of 9th W of Grand Ave (850 Hope St)	605
Olympic West Garage Lot W	2,500	P8 N of 11th W of Grand Ave (Central Park)	228
Lot #1 Garage (including SW VIP)	400	P9 N of 11th W of Olive St (Joe's #1001/Joe's #1050/1020 Grand)	324
Lot C Cherry St	650	P10 N of 12th W of Olive St (1150 Grand Ave/ AT&T Center Olive Garage)	112
Lot #4	115	P11 N of Pico Blvd W of Olive St (Joe's #1200)	364
Lot #10 (Joe's #913)	238	P12 S of Venice Blvd W of Flower St (1500 Figueroa/1366 Figueroa)	195
Lot #8	130	P13 both sides of Hope St (508 Pico/1308 Hope)	300
Lot #9	148	X1 S of 9th W of Flower	55
Lot #12 (Joe's #832)	352	X2 N of Olympic W of Flower	150
Lot #11	840	X3 S of Olympic W of Hope	108
Lot #5 (Joe's #1220)	475	X4 S of Olympic E of Flower	30
Lot #6	160	X5 S of 11th W of Hope	98
Lot #7	210	X6 N of 12th E of Flower	93

PARKING FACILITIES[1]	ESTIMATED CAPACITY
Lot #13	90
Convention Center West Hall	2,1502
Convention Center South Hall	2,1502
Bond Lot	150
Venice Garage	1150
P1 at N of 8th W of Figueroa St (7th&Fig Lot)	1300
P2 at N of 8th W of Flower St (Joe's #724)	276
P3 N of 9th W of Figueroa St (CLOSED)	0
P4 b/w 9th and 8th Pl (865 Figueroa)	841
P5 N of 9th W of Flower St (left) (888 Figueroa)	550
P6 N of 9th W of Flower St (right) (LAZ Parking #170311)	588

PARKING FACILITIES[1]	ESTIMATED CAPACITY
X7 N of 12th W of Hope	64
X8 S of 12th W of Hope (Joe's #1212)	95
X9 S of Pico E of Flower	25
X10 S of Venice W of Flower	20
X11 S of Olympic W of Grand	144
X12 N of 11th W of Grand	50
X13 N of 12th E of Hope (enter in alley off 12th)	20
X14 S of 12th W of Grand	116
X15 N of Pico E of Grand	400
X16 S of 8th W of Figueroa (Joe's #827)	800
X17 N of Olympic E of I-110	174

Notes:
1 This information is accurate as of the site visit on February 13, 2014, but some surface lots may no longer be operational due to planned development. Spaces for the Convention Center have been divided equally between the two sites as no subdivided capacity figure was available.

the purposes of this feasibility study, a posted decongestion fee of $4 (resulting in an approximately $3.29 average fee after resident and low-income discounts are applied) was settled on, based on the results of travel demand model analyses, reaction of focus group participants, and conducted stated preference survey.

The base case analyzed charging of users crossing the boundary points for up to a maximum of two times per day. Refinements were made reflecting charging a maximum of once per peak period per day. This still represents a maximum of twice per day, but allows for users to utilize the boundary crossing as many times as needed per peak period. Furthermore, to help public acceptance, the simpler once per peak period is more easily comprehended. Additionally, focus groups of local stakeholders encouraged the most simplistic design, and as a result, all fee reductions were eliminated except for resident discounts and discounts for low-income households.

Transit Enhancements

Enhancements to existing and planned transit service were identified as a critical program component. As drivers shift to other transportation modes, transit services will bear a majority of the shift away from personal automobiles. Therefore, expansion of the capacity of transit services is required to adequately serve the populations traveling to, from, and around the proposed program area, which is served by Metro, Santa Monica Big Blue Bus, and Culver CityBus.

In the development of the Westside concept, a single circulator bus route within the study area was initially proposed, utilizing Santa Monica Boulevard, Barrington Avenue, Olympic Boulevard, and 20th Street. This route provided connections to the two Metro Expo Line Stations within the study area (Bergamot and Bundy Stations). During the course of the pilot program concept development, a second circulator bus route was added for the northern portion of the program area which primarily utilizes Montana Avenue, San Vicente Boulevard, Barrington Avenue, Wilshire Boulevard, and 17th Street. This circulator route would connect to the Metro Expo Line 17th Street/SMC Station. Both routes would operate in both clockwise and counter-clockwise directions. Enhancement to existing service would also be

Table 3-28

LA LIVE VARIABLE PARKING PRICING PROPOSAL

TIME TO EVENT	INCREASE IN PRICE (EXPRESSED AS A % OF BASE PRICE)
Prior to 3 hours before event start	Zero – the price during this period is the “Base Price”
3:00-2:00 before event start	20%
2:00-1:30 before event start	40%
1:30-1:00 before event start	60%
1:00-0:30 before event start	80%
30 mins before event start or later	100%

included with increased bus frequencies by providing service at least every 12 minutes during peak periods and every 20 minutes during off-peak periods.

Additional transit enhancements include providing commuter bus routes to the program area which would provide an alternative to driving to the area (for those who do not have the option to shift the time of their travel but do not want to pay the fee). The two routes included within this program are the northern route to Encino and the southern route to Torrance/Long Beach. The transit enhancements analyzed in this study are shown in Figure 3-12. These enhancements are preliminary and would need to be refined in coordination with transit operators if the proof-of-concept were to move forward for further evaluation.

Active Transportation Improvements
In addition to the transit improvements funded from program revenues, improvements to pedestrian and bicycle infrastructure would also be funded through the net revenues and are assumed as part of the program. As users shift away from their automobiles, it is important to ensure mobility is not adversely affected. Improvements could include additional paved bike paths and striped lanes, widening of sidewalks, adding bike share racks, and improved landscaping to enhance the active transportation experience. Renderings of potential improvements are shown in Figure 3-13 through Figure 3-15. These renderings are examples and the exact depictions are not included in the pilot program definition, but included as a reference for the type of improvements that could be implemented.

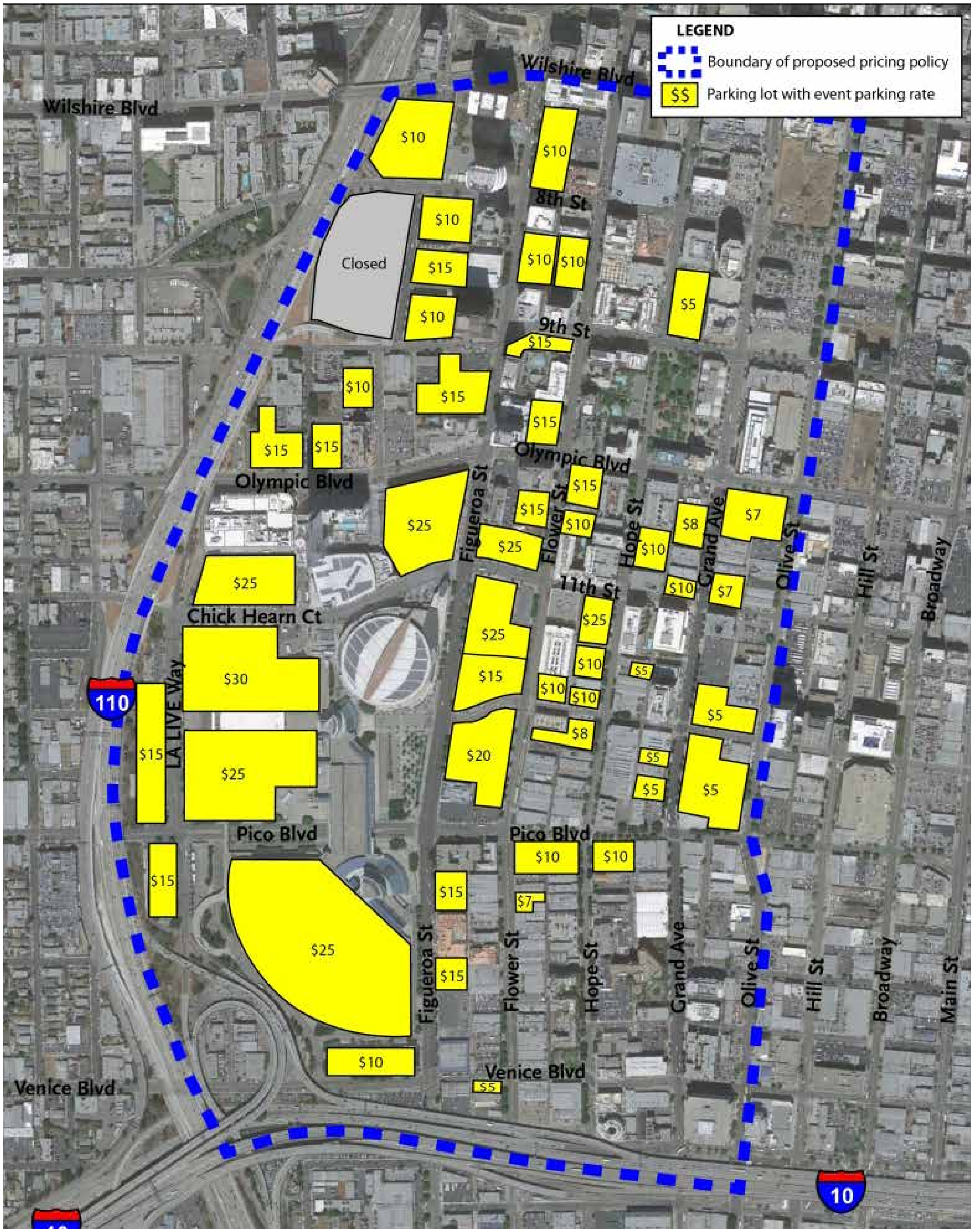
Table 3-29

SUMMARY OF ATTRIBUTES FOR THE LA LIVE BASE ALTERNATIVE

ATTRIBUTE	BASE CASE ASSUMPTION
Type of charge	Adjustments to event parking pricing based on event timing at LA LIVE. Each lot defines its own "Base Price" to adjust
Time of charge	Three hours prior to designated events at LA LIVE
Amount of charge	20% of Base Price three hours, two hours then half-hourly in the run up to an event
Exemptions	None proposed
Discounts	None proposed
Collection technology	Credit and debit cards with the option of cash if the operator wants to offer it
Area Boundaries	All event parking within the area bound by I-10, I-110, Olive Street and Wilshire Blvd, as shown in Figure 3-11

Figure 3-11

PROPOSED LA LIVE ALTERNATIVE PROJECT BOUNDARIES



Source: Site Visit

Figure 3-12

PROPOSED TRANSIT ENHANCEMENTS

Figure 3-13

POTENTIAL IMPROVEMENTS: OLYMPIC BOULEVARD/BERKELEY STREET

Current Street Design

With Implementation of Pilot Program

Figure 3-14

POTENTIAL IMPROVEMENTS: DORCHESTER UNDERCROSSING AT I-10

Current Street Design

With Implementation of Pilot Program

Figure 3-15

POTENTIAL IMPROVEMENTS: OLYMPIC BOULEVARD AND SAWTELLE BOULEVARD

Current Street Design

With Implementation of Pilot Program

3.3 GOALS AND SCOPE OF THE MOBILITY GO ZONE PROGRAM EVALUATION

Throughout the iterative screening process described in the previous sections, two geographic areas (West Los Angeles and LA LIVE) were assessed more thoroughly, which analyzed travel markets, trip patterns, technical and economic feasibility, and an initial concept of operations for a potential pilot program. Based on these criteria, the employment-rich area of the Westside was identified as the most promising candidate for further evaluation.

The designated congestion pricing area would include parts of the Cities of Los Angeles and Santa Monica, encompassing the employment concentrations along Wilshire, Santa Monica, and Olympic Boulevards west of I-405. The study area is generally bounded by Montana Avenue and Sunset Boulevard on the north, I-405 on the east, I-10 on the south, and 20th Street on the west. These boundaries were used for modeling and evaluation purposes, and would need to be refined in subsequent phases of evaluation.

The evaluated pilot program has the following major goals:

- Promote a balanced transportation system by encouraging residents and visitors to consider their travel choices. Travelers can choose to pay the fee, or they can choose to travel by another mode or at another time. They may make one choice on one day, and another choice on another day, depending on their needs each day. The presence of the fee would encourage people to think about their options and, in so doing, would encourage some people to choose alternative modes of travel each day.
- Reduce congestion. For drivers who choose to pay the fee, automobile travel would be less congested and more convenient within the pilot program area, as well as on the major arterials leading into it. By removing just a fraction of the traffic volume, congestion can be greatly reduced. Reduced congestion would also improve travel speeds for buses in and to the area.
- Increase the use of transit and active transportation. The enhanced transit services and bicycle and pedestrian facilities would offer improved mobility options to those who choose not to drive, and the share of travelers choosing those modes would increase.
- Improve quality of life. Reduced congestion levels and improvements to alternative modes of transportation would increase mobility in the pilot program area, allowing residents and visitors to engage in activities that they may now pass up.
- Reduce VMT/VHT and GHG emissions. By shifting some trips from automobile to transit and active modes of transportation, the pilot program would demonstrate that pricing can be used as a tool to reduce VMT and VHT, which leads directly to a reduction in GHG emissions.

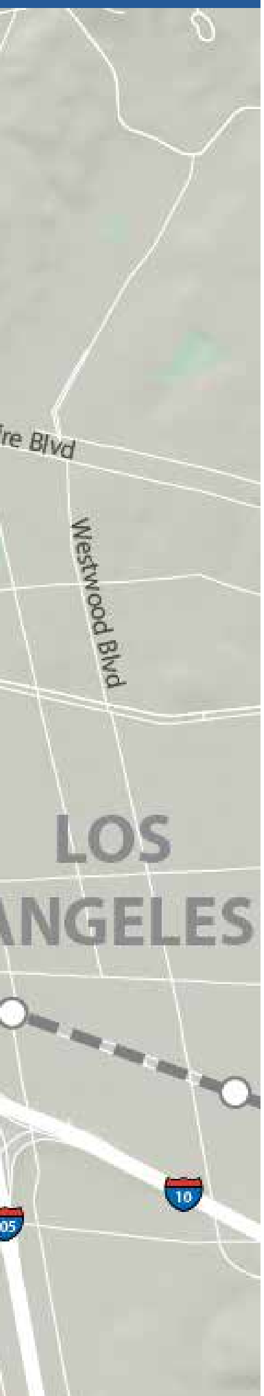
The evaluation process used the refined Westside Cordon Base Alternative for a more in-depth analysis of travel patterns using the SCAG RTP travel demand model and informed continued analyses related to economics, equity, and financial implications of a broader congestion relief program also referenced as the Mobility Go Zone Program. Additionally, a concept of operations was developed to guide the analyses. All of this information is presented in the next chapter.

4.0

EVALUATION OF MOBILITY GO ZONE PILOT PROGRAM CONCEPT

Figure 4-1

MOBILITY GO ZONE PILOT PROGRAM PROPOSED BOUNDARIES



4.1 SUMMARY DETAILS OF THE MOBILITY GO ZONE PILOT PROGRAM

Following the development described in Chapter 3, the concept described and analyzed as a potential pilot program throughout the remainder of this study has been named the Mobility Go Zone Program and is the culmination of the Westside Cordon Base Alternative with the refinements listed in Section 3.2. The analyzed program is a proof of concept to assess the feasibility of such a program in an area experiencing high levels of traffic congestion. SCAG will continue to evaluate different areas around the region and Los Angeles, including continuing assessment of parts of Downtown Los Angeles. The boundaries used for proof-of-concept / feasibility analysis purposes in this study are shown in Figure 4-1 and modeling details for the feasibility analysis include the following:

- AM and PM peak period inbound-only fees
- AM peak period will be 6 to 9 AM (3 hours) and PM peak period will be 3 to 7 PM (4 hours) in length
- Users are only charged once per peak period (multiple crossings allowed, but users only charged for the first crossing per peak period)
- The decongestion fee is assumed to be approximately $4 per entry, with discounts provided to residents within the study area (90%) and low-income households around the region (50%); additionally, high occupancy vehicle discounts could be provided as a policy alternative and are discussed in Section 4.4, but are not assumed in the base scenario analyzed
- Program revenues would pay for local transit improvements (potential improvements shown in Figure 3-12) and active transportation improvements (which would need to be coordinated with affected jurisdictions)
- Vehicle identification through automatic license plate recognition and/or FasTrak® Integration (discount given for processing through FasTrak® transponders) with payment options including online account (FasTrak®), pay in participating local stores, or pay by mail invoice

4.2 WHY WESTSIDE?

In recent decades, the Westside of Los Angeles, including a portion of the City of Santa Monica, has become a regional employment hub, attracting commuter traffic from the greater Los Angeles area. Traffic flows on I-10 have shifted from the previous conventional city-center configuration in which heavier traffic flows headed from the Westside into Downtown Los Angeles in the morning and returned in the evening, to the current situation, in which the heavier traffic flows head towards the Westside in the morning and return east in the evening. The area has been experiencing moderate growth as former industrial uses have been replaced by office uses and employment density has increased sharply, simultaneously causing traffic congestion in the area to worsen. This trend is expected to continue as the remaining industrial and large commercial parcels transition to office uses housing major employers in the media and technology industries. This shift in land use patterns has moved the primary traffic destinations from the extreme western end of the corridor (i.e., downtown Santa Monica) to locations just north of I-10 and just west of I-405.

This area of the Westside is primarily a business center with approximately 80,000 jobs and a very high jobs-to-housing ratio (3:1), making it a "second downtown" that experiences substantial movement into and through the area. Employment densities within the study area exceed 20,000 workers per square mile along portions of Olympic and Wilshire Boulevards, as shown in Figure 4-2. This high concentration of employment creates predictable commuting patterns during AM and PM peak periods for work-based trips, but similarly creates heavily congested corridors heading to the area in the AM peak period and leaving the Westside in the PM peak period.

As commuters travel from around the region, primary regional access to the area's main employment

Figure 4-2

EMPLOYMENT DENSITY IN STUDY AREA

Source: U.S. Census, On the Map

centers is from I-10 and I-405. The westbound I-10 off-ramp at Cloverfield Boulevard handles much of this incoming traffic and regularly becomes highly congested, with long queues affecting the mainline traffic flow. Figure 4-3 shows the westbound I-10 off-ramp at Cloverfield Boulevard in the AM peak period and the overflow of ramp traffic onto the mainline.

I-10 and I-405 deliver large amounts of automobile traffic to the study area, but these regional highways also form physical barriers that inhibit the smooth flow of traffic in and out of the area. Both freeways have a very limited number of undercrossings or overcrossings for arterial roadways. Sunset Boulevard, Santa Monica Boulevard, Wilshire Boulevard, Olympic Boulevard, and Bundy Drive regularly operate at or near LOS F in the PM peaks leading to the two major highways. This congestion causes a 35% delay in travel time during the PM peak period, the largest of any analyzed area in Los Angeles. During peak periods, vehicle queues extend along the primary roadways that connect into I-405 or I-10 and congest both the highways and roadways in the area. Traffic routinely clogs residential streets, resulting in a recent controversy over mobile navigation applications that direct commuter traffic to these streets.

In addition to the large amount of employment related traffic destined for the Westside, the area's roadways continue to serve their historic purpose of moving traffic through the region, to and from destinations on either side. Downtown Santa Monica to the west, and Beverly Hills, Century City, and Hollywood to the east remain destinations in their own rights, and the major corridors of the Westside carry large amounts of traffic between these destinations as a majority of trips in the area are less than five miles in length. Additionally, nearly half of the automobile trips are through trips and use the area's roadways to travel between origins and destinations outside the area.

Another key travel characteristic in the area is non-work trips. These trips are typically more flexible in regards to time-of-day and mode choice and therefore can often be shifted to off-peak times or served by an alternative to driving, especially if incentivized to do so. More evenly dispersing trips throughout the day can effectively alleviate congestion during peak periods by making traffic flow more freely as fewer cars will be on the roadway at any single time.

The Westside has been a center for innovation in recent years as technology and media companies have been relocating to the area. The City of Santa Monica in particular has been a pioneer in walking and biking infrastructure with the most robust network of bike lanes, the Breeze bike share program, electric scooters, and enhanced crosswalks which are necessary elements to improve overall mobility in the area. The Metro Expo Line traverses through the area connecting the Westside to Downtown LA and all destinations in between, which has seen extremely high levels of ridership.

The local community has voiced their concerns with traffic. Participants in focus groups conducted as part of this study verified that traffic congestion is at the top of the concerns of both residents and employees within the area. In focus groups consisting of persons living within the boundaries, those living adjacent to the area, and those who work in the area but do not live in or adjacent to it, traffic congestion was identified as the number one issue by almost all participants. Participants were almost unanimous in stating that their daily lives are negatively affected by the levels of traffic encountered, and that they limit their activities in response to congestion. Members of the focus groups also indicated that alleviating congestion would result in major improvements in their quality of life. Similarly, there was early support from key stakeholders on the Westside to continue studying this potential pilot program, whereas this was not the case in other areas evaluated during the study process.

Figure 4-3

WESTBOUND I-10 OFF-RAMP AT CLOVERFIELD BOULEVARD

4.3 HIGH-LEVEL CONCEPTUAL OPERATIONAL DESIGN

A high-level overview of the conceptual design and specifications of the decongestion system envisioned for the Mobility Go Zone Program was developed and is described in this section. The design assumes FasTrak® transponders as the primary method of vehicle recognition, with automatic license plate recognition (ALPR) as a secondary method. The conceptual design and specifications identify critical elements of the decongestion system described, provides information on field technology options, and assesses the implementation readiness.

CONCEPTUAL PRICING DESIGN

The concept of operations for the Mobility Go Zone Program assumes the installation of toll tag readers to identify vehicles with a FasTrak® transponder and overhead ALPR cameras to capture license plate images to charge the decongestion fee to all vehicles entering the designated area (unless exempt) during established peak periods. Trips originating within the boundaries are not charged, whether they stay in the area or leave. A back-office software system at the central office processes ALPR transactions and uses existing FasTrak® accounts associated with toll/express lane facilities or builds new accounts for users to review and pay assessed charges. Handling of non-payment would be comparable to existing toll facilities in the region (i.e., Metro's ExpressLanes), with suspension of vehicle registration being the final recourse.

The following subsections describe the components of the Mobility Go Zone Program system that identifies a vehicle entering a specified zone and collects a fee for that activity.

Figure 4-4

EXAMPLES OF DEPLOYED ALPR CAMERAS

Lower end, single pole, side fire (South Africa)

Over road cantilever (Sweden)

Over road cantilever (Sweden)

Full Span Gantry (Singapore)

Field Technology Components
In order to be well-suited for the program, a technology must be capable of identifying 100% of the vehicles crossing the boundary points, convenient to the user, and able to accommodate frequent users as well as infrequent or one-time users. Several technology options were reviewed in the FHWA document, Technologies That Enable Congestion Pricing: A Primer, to identify potential technologies that could be applied.

Dedicated Short Range Communications (DSRC) – Transponders and Readers
DSRC is the most common form of primary electronic congestion-pricing technology in general use and is the standard on most free-flow toll facilities. The technology is based on on-board units (OBUs), sometimes referred to as tags or transponders, that communicate with gantry-mounted equipment at checkpoints. The roadside equipment identifies and verifies each vehicle's OBU, and depending on the type of system, either processes a charge from its designated account or confirms its rights of access.

Metro's ExpressLanes facilities on the I-10 and I-110 use Electronic Toll Collection (ETC) to automate payments and eliminate the need to collect payments at toll booths or collection plazas. Current and planned express lane facilities require users to carry a transponder in the vehicle to assign charges to user accounts. Thus, drivers in the greater Los Angeles area are familiar with ETC, and some may already own FasTrak® transponders compatible with those assumed for the Mobility Go Zone Program. However, penetration is low on the Westside, as the locations of existing express lane facilities in the Los Angeles area are all south and east of Downtown Los Angeles. In addition, these ETC systems meet Caltrans requirements under Title 21 for statewide interoperability, reducing costs associated with reconciling charges with other agencies.

Automatic License Plate Recognition (ALPR) Technology
ALPR is based on images taken of vehicle license plates, which are then processed through optical character recognition software to identify the vehicle by its license plate using front- and rear-located cameras. Once identified, the required charge or permit-checking processes are undertaken. Figure 4-4 shows examples of ALPR cameras mounted on poles or overhead gantries.

A key issue with ALPR facilities is the level of reliability of the images. The best systems are capable of read rates of around 98% in good condition, but this can be lower as a result of light reflections in the image or dirty or damaged vehicle license plates. This leads to the need for manual checking of those plates and can add significantly to processing costs. In the United States, most ALPR systems have been used on toll roads for payment violation enforcement, but this is changing. As toll facilities move to cashless open-road tolling, they are using ALPR systems as a tolling account rather than tags or DSRC transponders.

TECHNOLOGY DEPLOYMENT LOCATIONS
Figure 4-5 shows the boundaries and assumed entry points of the Mobility Go Zone Program that cover approximately 4.3 square miles within the Cities of Santa Monica and Los Angeles.

A review of the study area was performed to identify the boundary points where vehicles would enter the Mobility Go Zone Program boundaries. Forty-seven (47) unique entry points were identified. The review looked at potential challenges to deploying cordon pricing field devices from a roadway geometry standpoint. The two detection points shown north of Sunset Boulevard are intended to prevent travelers from the northwest from using the neighborhood and smaller residential streets in the hills north of Sunset Boulevard to bypass the decongestion fee. The equipment at each boundary roadway would be designed as one of two types of entry types, described below.

Entry Type 1: Low-Volume, Two-Lane Road
Entry Type 1 is typically a smaller road with one through travel lane in each direction and possibly a turn pocket and/or parking on one or both sides of the road. For this road type, the ALPR detection zone is assumed to be placed downstream of the boundary point. Because these are lower volume, typically residential roads with no lane markings, a capture zone will be needed from curb to curb. Therefore, the ALPR and transponder readers will need to be able to view from curb to curb on the downstream approach. Figure 4-6 provides an example of a Type 1 entry point.

Entry Type 2: High-Volume with Median
Entry Type 2 is typically a multi-lane road with a striped or raised median. These are higher volume facilities with two-way traffic and the ability for a vehicle to veer in the opposite direction of traffic to avoid the ALPR view is minimal. Therefore, it is assumed that the ALPR field of view will only need to stretch from the curb to the median or centerline striping. Figure 4-7 provides an example of an Entry Type 2 boundary point.

ASSESSMENT OF IMPLEMENTATION READINESS
To develop a field deployment and overall deployment cost model, vendors in the applicable spaces were engaged to develop budgetary deployment cost estimates for capital, operations and maintenance costs. Each of the Mobility Go Zone Program entry points was identified as a Type 1 or a Type 2 entrance and evaluated for implementation readiness based on the presence of existing communications and equipment. An entry point is considered "Ready" for implementation if the location has ITS equipment and network connectivity that can be leveraged to house equipment and serve as a communications connection. An entry point is considered "Needs More Infrastructure" if there is no or limited ITS infrastructure available for connection. Table 4-1 presents a summary of the quantity entry point types and readiness.

Additionally, a back-office software system housed at a physical facility is assumed to be the central office for

Figure 4-5

MOBILITY GO ZONE ENTRY POINTS

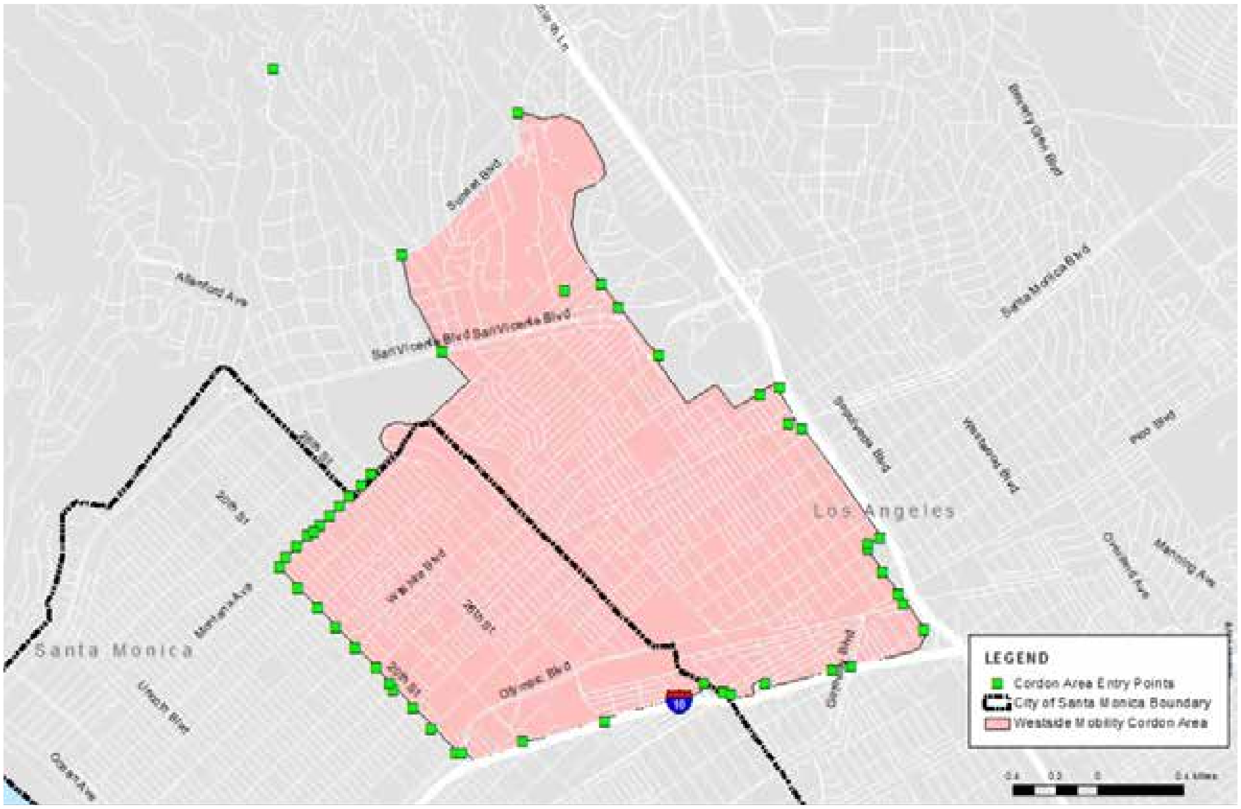


Figure 4-6

ENTRY TYPE 1 EXAMPLE

staff to perform functions such as managing customer accounts, providing customer web support, processing violations and payments.

The central system for pricing is assumed to share operational and functional aspects similar to tolling/express lane systems that use account-based ETC. ETC systems used for tolling feature a central office operation for processing account transactions, setting decongestion fee rates, monitoring traffic conditions and system performance, and violation enforcement.

Customer Service Management

The primary point of contact for customers is assumed to be a self-help website and interactive voice recognition (IVR) over the phone that will provide information and frequently asked questions (FAQs) about the program, as well as online tools to perform typical account management functions such as updating account profiles and preferences and retrieving information on usage and payment histories. The website would be complemented by a mobile application that provides access to the web site features on a user's smartphone. The mobile application could be similar to the one available for London Congestion Charge users where they pay charges, view a live map of congestion pricing zones, receive alerts when entering a zone, and set payment reminders.

Field Communication Options

Each of the entry points are assumed to have FasTrak® transponder readers and ALPR equipment to handle toll tag and vehicle license plate recognition. Additional ITS devices may be deployed to collect traffic data, provide real-time camera feeds to monitor traffic conditions and electronic signage to display pricing information. All of the data collected at the entry points need to be transmitted back to the central office system for processing and archiving. Designing a communications architecture that can provide sufficient bandwidth for field-to-central connectivity for a pricing system depend on several factors: (1) the volume of daily plate reads and the quality of image data transmitted between the entry point equipment and central office system; and (2) availability and reliability of communications infrastructure in the field.

An ALPR system requires more bandwidth to transmit raster images which are larger in file size than binary data transmitted from a toll tag. Compared to a CCTV camera however, an ALPR system requires less bandwidth, since the cameras only transmit plate images when vehicles enter the detection zone. Table 4-2 provides a high-level estimate of the bandwidth needed to communicate with the field equipment and supporting ITS devices to monitor traffic conditions at the entry points. Deployment of roadside equipment at the 47 entry point locations is estimated to consume 1,348 megabits/

Figure 4-7 **ENTRY TYPE 2 EXAMPLE**

second (Mbps) of bandwidth, or 1.35 gigabits/second (Gbps).

Most arterial traffic signal systems deploy a variety of ITS devices such as system detectors using fiber optics, twisted-pair or wireless to provide connectivity with the traffic management center. The desktop survey of the entry points indicated that some of the Type 2 locations at major roadways have existing traffic signal infrastructure that could be used to provide last-mile communications to the field equipment. Availability of existing infrastructure at Type 1 locations was more limited considering that they are located at residential collector roads. Table 4-3 provides a qualitative comparison of the advantages and disadvantages associated with each type of communications media. While fiber optic communication architecture provides the greatest amount of bandwidth and scalability, the cost of such a network cannot be ignored. For example, there could be locations that do not warrant installation of $500,000 (i.e., roughly 5 miles) of cable system to connect one site/device that only needs less than 2 Mbps network access. In that instance, it would be more cost effective to utilize wireless, or reuse existing twisted-pair with DSL for a higher bandwidth option. For this reason, the communications architecture should support a hybrid of communication media instead of solely depending on one medium.

Table 4-1

NUMBER OF EACH ENTRY POINT TYPE AND IMPLEMENTATION READINESS

ENTRY POINT TYPE	READY	NEEDS MORE INFRASTRUCTURE	**Total**
Type 1	3	23	**27**
Type 2	8	13	**21**
Total	**11**	**36**	**47**

Table 4-2

FIELD COMMUNICATION BANDWIDTH ESTIMATE

FIELD COMPONENT[1]	NUMBER OF DEVICES	PER UNIT BANDWIDTH DEMAND (KBPS)	BANDWIDTH DEMAND (KBPS)	TOTAL BANDWIDTH DEMAND (MBPS)
ALPR Camera Unit	188	1,600	300,800	300.8
Vehicle Detection Systems	94	250	235,000	235.0
FasTrak® Transponder Reader	47	100	4,700	4.7
		Total Payload	**540,500**	**541**
		Network Overhead (20% of payload)	**108,100**	**108.1**
		Total Bandwidth Demand	**648,600**	**649.1**

1 Assumes an image capture equivalent to a 640x480 JPEG file and the transmittal of accompanying metadata; Four ALPR cameras per location – 2 facing upstream and 2 facing downstream; 2 detection systems per location.

Table 4-3

FIELD COMMUNICATION MEDIA COMPARISON

COMMUNICATIONS MEDIA	PROTOCOL	BANDWIDTH	COST TO IMPLEMENT	EFFORT TO MAINTAIN	SCALABILITY
Fiber Optics	Ethernet	High	High	Moderate	Moderate
Twisted-pair	Serial	Low	High	Low	Low
Twisted-pair	Ethernet	Moderate	High	Low	Moderate
Wireless	Ethernet	Moderate	Moderate	High	High
Wireless	Serial	Low	Low	High	High

4.4 TRAVEL DEMAND ANALYSIS

The goals of the pilot program, as stated previously, are to reduce congestion, promote a balanced transportation system, benefit the local economy, and improve environmental conditions. This section evaluates the program with respect to the identified goals. The program's benefits and impacts were evaluated for two geographic areas—both within the Mobility Go Zone Program area itself as well as throughout LA County. The time period assessed in this section is represented by the earliest potential start date in 2020 and evaluated over a 16-year horizon (in 2035) in order to capture long term benefits and impacts.

METHODOLOGY

The travel demand model selected for the evaluation of cordon pricing alternatives was SCAG's travel demand model (Version 6.2) developed as a part of the 2012 Regional Transportation Plan (RTP). The model was validated for the West LA area and subsequent enhancements were done to the model application process to evaluate cordon pricing alternatives.

Model Validation

The performance of the SCAG model for the selected area was validated first to make sure it represented current/base year (2008) conditions reasonably accurately. As part of the static validation process, highway and transit data were collected to evaluate the performance of the SCAG model and its ability to replicate base year (2008) travel behavior. Most of the necessary data were available from existing sources, except for some highway counts. Field surveys were performed to collect the missing traffic counts. After data collection, results from both the highway and transit components of the SCAG model were reviewed for the validation area, and necessary model changes were done to improve the validation.

Once the model was validated, the sensitivity of the model to pricing was tested as part of dynamic validation. The validated model was applied to the Downtown Los Angeles Cordon alternative from the initial phase of the Express Travel Choices Study (2012) to test the sensitivity of the model to pricing, as well as to evaluate the impact of travel model changes. More details about the initial phase study that used newly developed (at the time of the study) model procedures in the SCAG model to evaluate the impacts of various pricing scenarios can be found in the Express Travel Choices Study. After reviewing the model results, enhancements were done to the model application process in order to address and resolve some model performance issues. These enhancements are described in more detail in the next section. Finally, the impacts of the Downtown Los Angeles Cordon alternative were compared with results from similar cordon pricing initiatives in London and Stockholm as a reasonableness check.

Model Enhancement

Some of the model processes in SCAG's travel demand model (RTP version 6.2) had been updated since version 6.0, which was used in the first phase of the Express Travel Choices Study. These updates included enhancements to the time-of-day procedure that prepares vehicle trip tables for input to the highway assignment step. This procedure takes decongestion fees into account to determine the number of automobile trips that either shift their start time or get suppressed entirely in response to the presence of a decongestion fee. Given these model changes and the findings of the initial phase of the Express Travel Choices Study of this program, before preparing forecasts of cordon pricing alternatives, test runs of a cordon pricing alternatives were undertaken to determine if the impacts due to pricing meet expectations based on judgment and experience of other similar programs globally. The model results were compared to the initial phase study as well as to other cordon programs as part of the Dynamic Validation.

Part of dynamic validation was to make any necessary changes to the model in order to produce more reasonable results during evaluation of the cordon pricing alternatives. This was accomplished by performing several test runs to analyze the way cordon pricing was incorporated in various steps in the SCAG model. Each test run involved modeling a cordon pricing scenario and analyzing the resulting impact from the introduction of a decongestion fee.

Model runs using fixed trip tables (i.e., overall person travel does not change between alternatives) were performed as part of the model review process. Using fixed person trip tables has the advantage of limiting the variability in inputs to mode choice to just the time and cost of travel. The Federal Transit Administration (FTA) recommends the use of fixed person trip tables when evaluating transit projects for this reason.

Changes in trip making (especially in models that use logit-based destination choice models like SCAG that include highway and transit level of service information) might cloud the estimation of benefits due to a highway or transit project.

The model application process for the cordon scenarios was modified to incorporate highway and transit validation changes, skimming enhancements for decongestion fees and fixed person trip approach. This modified model application process was used to evaluate all cordon pricing scenarios for this study.

Demand Forecasts
Highway and transit networks of the model were coded to reflect each of the alternatives described earlier, for opening year (2020) and horizon year (2035). Several model runs were conducted with differing input assumptions as part of the sensitivity analysis of the model. Year 2020 and 2035 forecast results for the Mobility Go Zone Program are provided in this section. The comparison of the forecast results of the alternative with the no project conditions was conducted at the cordon level as well as at the regional level. The model forecasts were compiled considering the following measures to compare the alternative against no project conditions:

- Mode choice (change in study area-related mode choice)
- Trip origins (change in peak auto and transit trips into the study area)
- New transit boarding (additional boardings on proposed circulator and commuter express transit routes)
- Congestion reduction (change in study area-related vehicle miles traveled (VMT) and vehicle hours traveled (VHT))

MODE CHOICE
The mode choice process splits the input person travel by mode of travel used for each trip (e.g., auto, carpool, transit). This section describes the mode choice for the following types of trips:

- Daily and peak mode choice: includes all trips that utilize the study area roadways (intra, inbound, outbound, and pass-through)
- Peak inbound trips: trips with origins outside the study area, but destinations within the study area
  - Vehicle crossings: peak inbound trips paying the decongestion fee with implementation of the program (residents, non-residents, trucks)
- Peak intra-zone trips: trips within both origin and destinations inside the study area

Opening Year (2020)

Mode Choice (All Trips on Study Area Roadways)
Table 4-4 displays the mode choice (person trips and mode share) for all trips utilizing the study area roadways with and without implementation of the Mobility Go Zone Program in the opening year. Automobiles dominate the mode share at 82% to 83% of all person trips, where half of those person trips are in a single occupancy vehicle and one-third of those person trips are in carpools of 3 or more passengers (CP3).

Transit and walk/bike trips do not account for as many trips, but both increase with implementation of the pilot program as drivers shift to other modes.

Mode Choice (Inbound Trips)
Table 4-5 displays the change in inbound trips with and without the project during both peak and off-peak periods. There is overall reduction of 19% in automobiles entering the study area during peak times, and a 22% reduction in the number of single occupancy vehicles entering the study area during peak times. Conversely, there is a 9% increase in inbound automobiles during off-peak times as drivers shift their discretionary trips from peak to off-peak times and/or find alternative mobility options. This leads to an overall reduction in daily automobile trips to the area.

Vehicle Crossings
Table 4-6 displays the number of vehicles crossing the study area's boundaries during peak periods and therefore eligible to be charged the decongestion fee. These include trips with destinations within the project area and pass through trips. Single occupancy vehicles account for approximately 70% of these automobile trips and CP3 account for 16%.

Intra-Zone Trips
Table 4-7 shows the mode share of intra-zone trips for automobiles, transit, and walking/biking for all trips, work trips, and non-work trips in 2020. The project would affect intra-zone work trips the greatest for automobile and transit trips as the proposed circulator routes make transit a more

Table 4-4

DAILY MODE CHOICE AND MODE SHARE (2020 PERSON TRIPS)

	AUTOS	TRANSIT	WALK/ BIKE
Without Project	441,342	33,894	56,985
Mode Share	83%	6%	11%
With Project	439,020	35,172	58,029
Mode Share	82%	7%	11%
% Change in Trips	-0.5%	+3.8%	+1.8%
% Change in Mode Share	-0.4%	+0.2%	+0.2%

Table 4-5

PEAK AND OFF-PEAK INBOUND PERSON TRIPS (2020)

	PEAK INBOUND TRIPS		
	AUTOS	TRANSIT	WALK/BIKE
W/o project	67,539	8,595	8,374
With Project	54,688	9,338	8,937
% Change	-19%	9%	7%
	OFF-PEAK INBOUND TRIPS		
	AUTOS	TRANSIT	WALK/BIKE
W/o project	68,355	6,303	8,475
With Project	74,413	6,405	8,463
% Change	9%	2%	0%

Note:
Automobile trips are presented in vehicle trips; transit and walk/bike are in person trips. Time of day shift occurs in the travel demand model after the mode choice step.

Table 4-6

PEAK PERIOD VEHICLE TRIPS CROSSING BOUNDARY POINTS (2020)

	AUTOS	TRUCKS
Non-resident	75,563	1,303
Residents	12,055	0
Total	**87,618**	**1,303**

attractive transportation option by allowing local commuters to get to work more easily and not need their cars to commute or get around West Los Angeles and Santa Monica. Local transit trips are primarily utilized for work purposes as there already exists a relatively large share of intra-zone work trips; this implies travelers will utilize the improved transit routes. Local walking and biking trips are primarily non-work based trips.

Horizon Year (2035)
Mode choice in 2035 will be similar to that in the opening year as travelers continue to make adjustments to their travel patterns to access the study area, but as consistent with other international projects, many of the effects are expected to take place quickly after a decongestion fee is originally enacted. The total number of trips is expected to gradually increase over the analysis period due to ambient growth.

Mode Choice (All Trips on Project Area Roadways)
Table 4-8 displays the mode choice (person trips and mode share) for all trips utilizing the study area roadways with and without implementation of the Mobility Go Zone Program in 2035. Automobiles continue to be the dominate mode choice at 82%, but transit sees a larger relative increase in trips compared to opening year as people shift their travel patterns. Single occupancy vehicles account for 40% of the total person trips and have a reduction of 0.6% total SOV trips from the no project scenario.

Mode Choice (Inbound Trips)
Table 4-9 displays the change in inbound trips with and without the project during both peak and off-peak periods. There is overall reduction of 19% in automobiles entering the study area during peak times, and a 22% reduction in the number of single occupancy vehicles entering the study area during peak times. Conversely, there is a 9% increase in inbound automobiles during off-peak times as drivers shift their discretionary trips from peak to off-peak times and/or find alternative mobility options. Similarly, there is a reduction in peak inbound carpool trips and increase in off-peak trips, but the magnitude is less than SOV as carpooling remains a more attractive mobility option within the Mobility Go Zone Program.

Vehicle Crossings
Table 4-10 displays the number of vehicles crossing the study area's boundaries during peak periods and therefore eligible to be charged the decongestion fee. These include trips with destinations within the study area and pass through trips. Single occupancy vehicles account for approximately 69% of these automobile trips and CP3 account for 17%, which is an increase in higher occupancy vehicles from the opening year analysis.

Intra-Zone Trips
Table 4-11 shows the mode share of intra-zone trips for automobiles, transit, and walking/biking for all trips, work trips, and non-work trips in 2035. Similar to the opening year, the project will have an effect on intra-zone work trips,

Table 4-7

INTRA- ZONE PERSON TRIPS MODE SHARE (2020 ALL TRIPS AND WORK TRIPS)

	ALL AUTOS			TRANSIT			WALK/BIKE		
	ALL TRIPS	WORK TRIPS	NON-WORK	ALL TRIPS	WORK TRIPS	NON-WORK	ALL TRIPS	WORK TRIPS	NON-WORK
W/o project	67%	65%	67%	5%	17%	3%	28%	18%	30%
With Project	65%	63%	66%	6%	18%	3%	29%	19%	31%
% Change	-1.8%	-2.4%	-1.6%	0.5%	1.5%	0.3%	1.2%	0.9%	1.3%

including those trips taken by automobile and transit as the proposed circulator routes make transit a more attractive transportation option by allowing local commuters to get to work more easily and not need their cars to commute or get around West Los Angeles and Santa Monica. As many local transit trips are utilized for work purposes, there already exists a relatively large share of intra-zone work trips implying travelers will utilize the improved transit routes. Local walking and biking trips are primarily non-work based trips already and will continue to be so as people will walk or bike for nearby errands or recreational travel.

TRIP ORIGINS

Figure 4-8 displays the districts, or Transportation Analysis Zones (TAZs), used within this analysis. While the project area is included within the West LA district, it is called out individually to show the trips that originate within the study area compared to outside of it but still within West LA.

Opening Year (2020)

All Trips

The percentage of trips originating in each district with destination in the study area is displayed in Figure 4-9. A majority of all trips originate from nearby (approximately 7 miles) as approximately 65% of trips originate within West LA and the pilot program area, combined. The next largest originating districts are the neighboring San Fernando Valley, Central LA, and South Bay at 7.8%, 7.6%, and 6.6%, respectively. No other single district has more than 3%.

Figure 4-10 and Figure 4-11 compare all trips made by automobiles and transit by originating districts, highlighting

Table 4-8

DAILY MODE CHOICE AND MODE SHARE (2035 PERSON TRIPS)

	AUTOS	TRANSIT	WALK/ BIKE
Without Project	478,936	39,397	64,357
Mode Share	82%	7%	11%
With Project	476,141	41,063	65,486
Mode Share	82%	7%	11%
% Change in Trips	-0.6%	+4.2%	+1.8%
% Change in Mode Share	-0.5%	0.3%	0.2%

Table 4-9

PEAK AND OFF-PEAK INBOUND PERSON TRIPS (2035)

	PEAK INBOUND TRIPS		
	AUTOS	TRANSIT	WALK/BIKE
W/o project	70,681	10,418	9,159
With Project	57,468	11,313	9,771
% Change	-19%	9%	7%
	OFF-PEAK INBOUND TRIPS		
	AUTOS	TRANSIT	WALK/BIKE
W/o project	74,505	7,802	9,459
With Project	81,783	7,947	9,446
% Change	9%	2%	0%

Note:
Automobile trips are presented in vehicle trips; transit and walk/bike are in person trips. Time-of-day shift occurs in the travel demand model after the mode choice step.

Table 4-10

PEAK PERIOD VEHICLE TRIPS CROSSING BOUNDARY POINTS (2035)

	AUTOS	TRUCKS
Non-resident	81,181	1,510
Residents	12,055	0
Total	**94,379**	**1,510**

the top origins. Automobile trips originating from nearby show a similar pattern to all trips as 60% of all trips originate from West LA (including the study area). Transit trips have a more even distribution with a large share coming from Central LA, which has a proportionally high amount of transit trips (19%) compared to its share of auto trips to the area (8%) due to the multiple existing east-west high-quality transit options, including Metro and Big Blue Bus Rapid bus services and the Metro Expo Line. Conversely, the San Fernando Valley and South Bay have lower shares of transit trips compared to auto trips, representing a gap in transit service. Additionally, a majority of transit trips originate in West LA (including the study area) demonstrating nearby travelers are already using transit and willing to use local alternatives to driving if available.

Work Trips
Figure 4-12 shows the distribution of work-based trips to the study area. The origins are more evenly distributed from around the region for work trips than all trips as only 41% of work trips originate within West LA (including the study area). When comparing auto versus transit trips (Figure 4-13 and Figure 4-14), a larger proportion of travelers from the San Fernando Valley and South Bay use automobiles to get to work; whereas, work commuters from Central LA rely more on transit. The proposed express commuter buses will directly serve the San Fernando Valley and South Bay to provide attractive transit options and facilitate shifting drivers to transit users. Furthermore, the transit share for work trips from West LA and inside the study area are higher than the automobile share demonstrating that people can and are willing to take short transit for work purposes if service is available to them. Areas such as the San Gabriel Valley and Gateway Cities do not produce a large amount of trips to the study area, these two districts have twice as many work trips (5% each) than all trips (2.5% each).

Non-Work Trips
Although the Mobility Go Zone Program includes charges to vehicles entering the area during typical commuting times, there is a large share of trips for non-work purposes that congest roadways during the peak periods. In the opening year, approximately 68% of trips into the study area are for non-work purposes. Three-quarters (76%) of all non-work trips originate from West LA (including the pilot program area) and most non-work trips are made by automobile (79%). Trips originating inside the study area are primarily non-work trips (85%). Many of these trips are non-time sensitive and can be shifted to off-peak times in order to alleviate congestion during peak periods if incentivized to do so.

Horizon Year (2035)

All Trips
The percentage of trips originating in each district and destination within the study area is displayed in Figure 4-15. As shown in the figure and similar to 2020, a majority of all trips originate from nearby (approximately 7 miles) as approximately 66% of trips originate within West LA and the study area, combined. The next largest originating districts are the neighboring Central LA, San Fernando Valley, and South Bay at 7.7%, 7.4%, and 6.3%, respectively. No other single district has more than 3%.

Table 4-11

INTRA- ZONE PERSON TRIPS MODE SHARE (2035 ALL TRIPS AND WORK TRIPS)

	ALL AUTOS			TRANSIT			WALK/BIKE		
	ALL TRIPS	WORK TRIPS	NON-WORK	ALL TRIPS	WORK TRIPS	NON-WORK	ALL TRIPS	WORK TRIPS	NON-WORK
W/o project	66%	65%	66%	5%	16%	3%	28%	18%	30%
With Project	64%	63%	65%	6%	18%	3%	30%	19%	32%
% Change	-1.8%	-2.5%	-1.6%	0.6%	1.6%	0.3%	1.2%	0.9%	1.3%

Figure 4-8

MAP OF ORIGIN DISTRICTS

Figure 4-9

PERCENTAGE OF TRIPS BY ORIGINATING DISTRICT WITH DESTINATIONS IN THE STUDY AREA (2020)

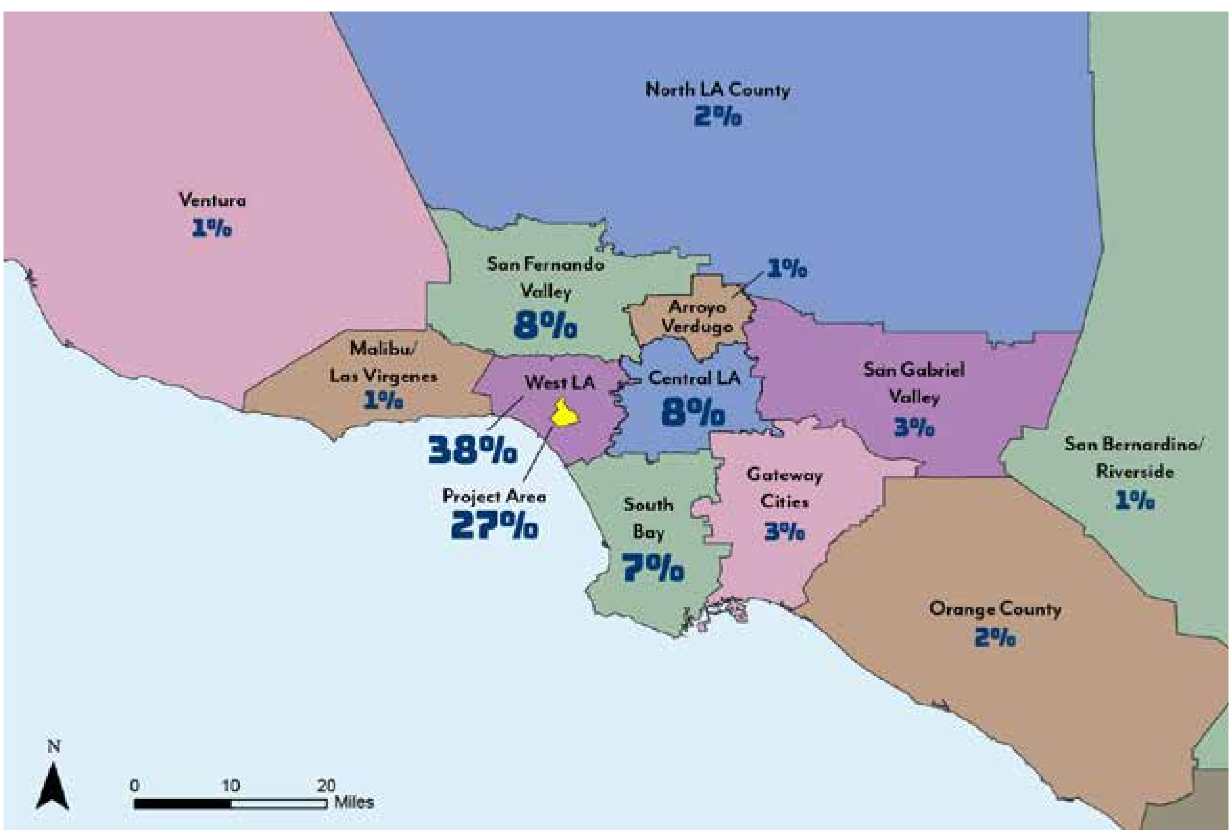


Figure 4-10

ALL AUTO TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2020)

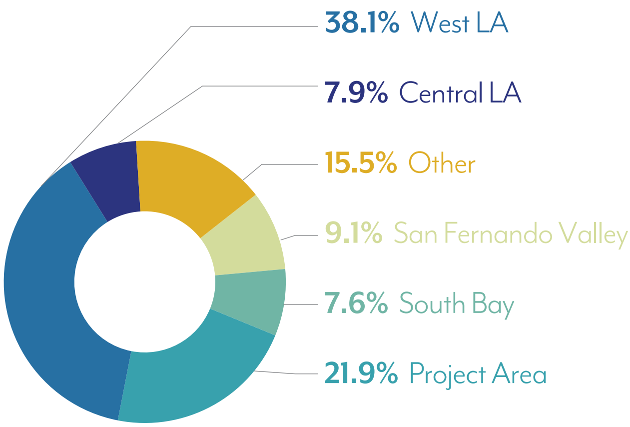


Figure 4-11

ALL TRANSIT TRIPS TO THE STUDY AREA – ORIGIN DISTRIBUTION (2020)

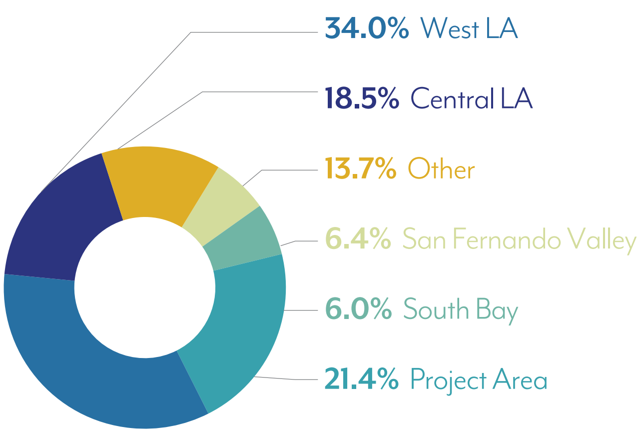


Figure 4-12

ALL WORK TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2020)

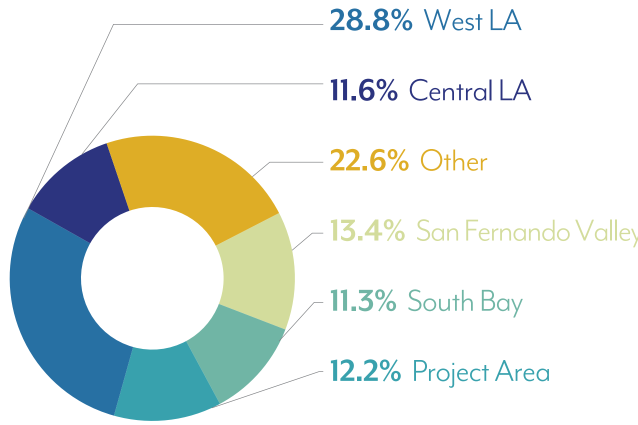


Figure 4-13

ALL AUTO WORK TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2020)

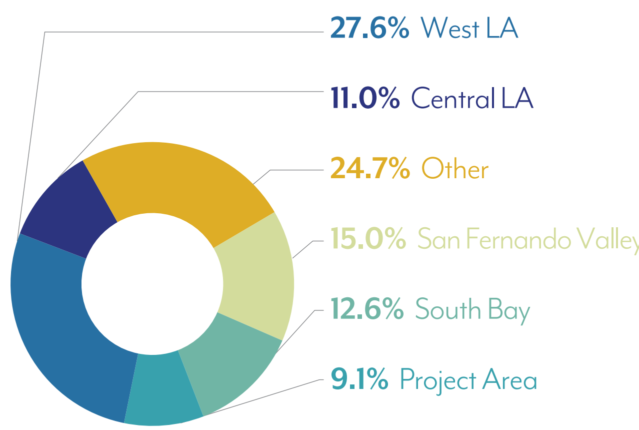


Figure 4-14

ALL TRANSIT WORK TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2020)

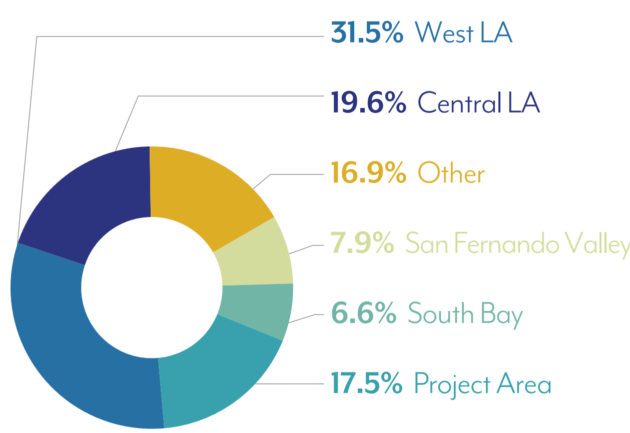


Figure 4-15

PERCENTAGE OF TRIPS BY ORIGINATING DISTRICT WITH DESTINATIONS IN THE STUDY AREA (2035)

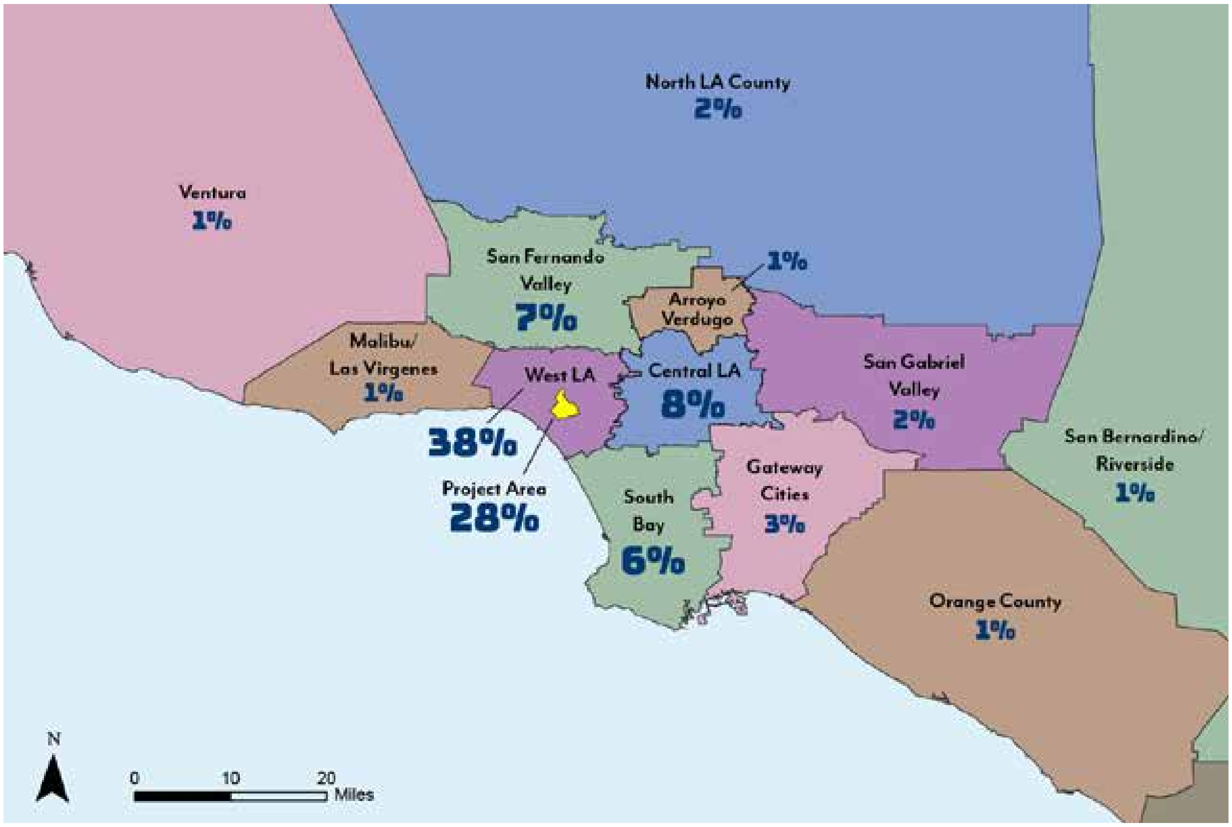


Figure 4-16

ALL AUTO TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2035)

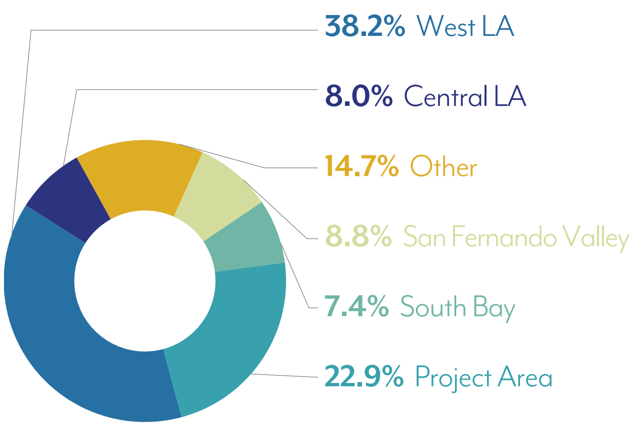


Figure 4-17

ALL TRANSIT TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2035)

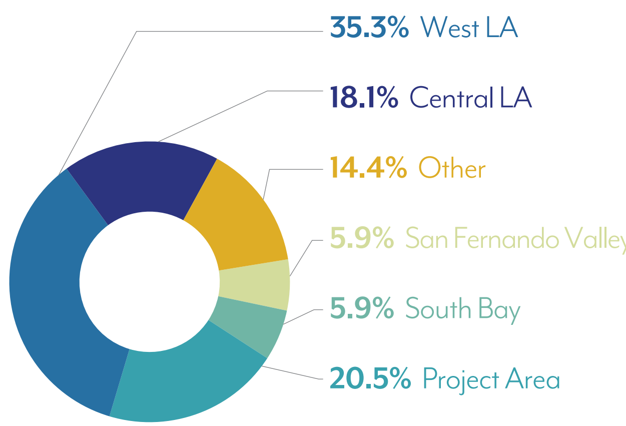


Figure 4-18

ALL WORK TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2035)

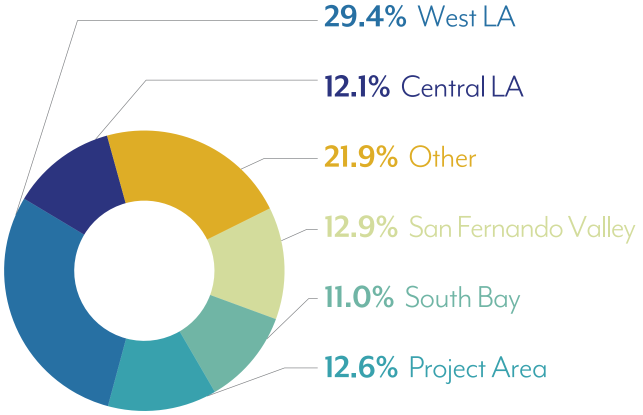


Figure 4-19

ALL AUTO WORK TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2035)

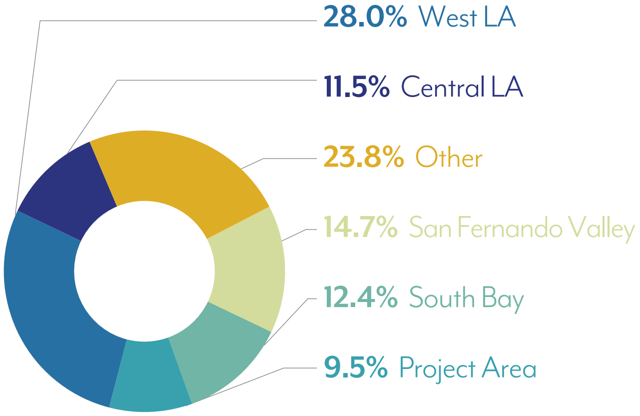


Figure 4-20

ALL TRANSIT WORK TRIPS TO STUDY AREA – ORIGIN DISTRIBUTION (2035)

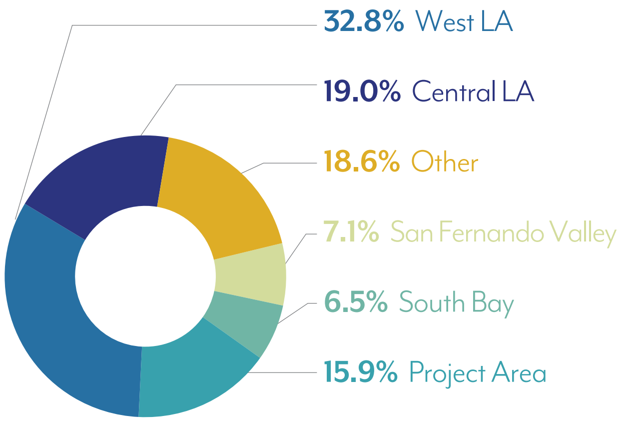


Figure 4-16 and Figure 4-17 compare all trips made by automobiles and transit trips by originating districts, highlighting the top origins. Automobile trips originating from nearby show a similar pattern to all trips as 61% of all trips originate from West LA (including the study area). Transit trips have a more even distribution with a large share coming from Central LA, which has a proportionally high amount of transit trips (18%) compared to its share of automobile trips to the study area (8%) due to the multiple existing east-west high-quality transit options, including Metro and Big Blue Bus Rapid bus services and the Metro Expo Line. Similarly to 2020, the San Fernando Valley and South Bay have lower shares of transit trips compared to automobile trips, representing a gap in transit service while a majority of transit trips originate in West LA (including the study area), which demonstrates travelers in the study area will continue to use transit and local alternatives to driving.

Work Trips

Figure 4-18 shows the distribution of work-based trips to the study area (2035). The origins are more evenly distributed from around the region for work trips than all trips as only 42% of work trips originate within West LA (including the study area). When comparing auto versus transit trips (Figure 4-19 and Figure 4-20), a larger proportion of travelers from the San Fernando Valley and South Bay use automobiles to get to work; whereas, work commuters from Central LA rely more on transit. The proposed express commuter buses will directly serve the San Fernando Valley and South Bay to provide attractive transit options and facilitate shifting drivers to transit users. Furthermore, the transit share for work trips from West LA and inside the study area are higher than the auto share demonstrating people can and will take short transit for work purposes if service is available to them.

Non-Work Trips

Although the Mobility Go Zone Program is designed to include charges to vehicles entering the study area during typical commuting times, there is a large share of trips for non-work purposes that congest roadways during the peak periods. In the horizon year (2035), approximately 70% of trips into the study area are for non-work purposes. Three-quarters (76%) of all non-work trips originate from West LA (including the study area) and most non-work trips are made by automobile (78%). Trips originating inside the study area are primarily non-work trips (86%). Many of these trips are non-time sensitive and can be shifted to off-peak times in order to alleviate congestion during peak periods if incentivized to do so.

New Transit Boardings

Transit improvements are a key aspect of the Mobility Go Zone Program and were discussed in detail previously in Section 3.2.. The transit improvements would include four new transit routes and enhancements on existing transit routes. These enhancements were incorporated into the travel demand model to determine the incremental ridership, including the magnitude of the shift from automobiles to transit. The proposed new transit routes, including two local circulator routes and two express commuter buses were shown previously in Figure 3-12. The local circulators are proposed to improve mobility within and adjacent to the study area, and the express commuter buses serve the two top origins (San Fernando Valley and South Bay/Long Beach) that contain disproportional transit trips compared with automobile trips, especially for work trips.

Table 4-12 shows the number of daily boardings for each of the four proposed routes, as well as the incremental Metro Expo Line boardings, in both the opening and horizon years. The circulator routes generate the highest daily boardings. Transit boardings in the area increases by 18% over the first fifteen years as travelers utilize alternatives to driving. Table 4-13 presents the amount of new transit riders that switch from driving (or other modes) onto transit, including onto both already existing and the program's proposed routes. The total boardings from the new routes are more than the increase in transit person trips within the project area, which suggests that most of the transit boardings shift to the new routes from other slower routes. This can be expected as part of the pilot program would also increase frequency of service along existing routes, overall making transit a more attractive option in and around the Mobility Go Zone.

Congestion Reduction (VMT and VHT)

The primary indicators of congestion and delay analyzed are vehicle miles traveled (VMT) and vehicle hours traveled (VHT).

Opening Year (2020)

Vehicle Miles Traveled (VMT)

As shown in Table 4-14 and Figure 4-21, VMT within the study area will be reduced by over 22% in the AM peak period and almost 21% during the PM peak period. VMT increases during all off-peak times within the study area as trips are shifted from peak to off-peak, which results in a daily VMT reduction of nearly 8% within the study area. This dispersion of time-of-day travel is a positive benefit that the project would provide by shifting traffic from congested peak periods to off-peak when there is available capacity on the roadways.

Vehicle Hours Traveled (VHT)

As shown in Table 4-15 and Figure 4-22, VHT within the pilot program area would reduce by more than VMT as vehicles move faster through the area due to less congestion. Within the study area, VHT would be reduced by nearly 24% in both the AM and PM peak periods. Over the course of an average day, the reduction in VHT would be 9.6% as travelers shift travel patterns from peak to off-peak to more evenly distribute vehicles throughout the day.

Horizon Year (2035)

As shown in Table 4-16, Figure 4-23, Table 4-17, and Figure 4-24 decongestion benefits in the horizon year of 2035 are similar to those in the opening year, but have slightly less VMT percentage reductions during peak hours due to ambient growth in the study area. However, due to the long-term mobility improvements proposed as part of this project, VHT will decrease by almost the exact same percent during peak hours in 2020 and 2035.

Carpool 3+ Free Scenario

A sensitivity analysis was conducted to evaluate the effectiveness of a policy lever to allow free passage for carpool with three or more passengers (CP3) in order to encourage increasing average vehicle occupancy. Average decongestion fees (after applicable discounts) of $3.00 and $1.50 were tested in the SCAG Travel Demand Model and the results were compared to evaluate the change in travel behavior. For the carpool 3+ free (CP3 Free) scenario, the elasticity of CP3 decongestion fee demand was determined from the $3.00 and $1.50 model runs and applied to the $1.50 results to derive the demand for CP3 Free Scenario. Inbound auto trips increased with the reduction in decongestion fee value and transit and walk/bike trips decreased as they are less attractive relative to the base scenario without CP3 free.

From the results for the 2020 $1.50 and $3.00 scenarios, the elasticity for CP3 demand with $1.50 decongestion fee value was derived and applied to determine the vehicle trips with $1.50 scenario and CP3 Free scenario. Table 4-18 summarizes the number of vehicles paying the decongestion fee during the AM and PM peak periods in the year 2020 for the CP3 Free scenario. These vehicle trips include both inbound and pass-through trips.

Table 4-12

DAILY TRANSIT BOARDINGS FROM PROPOSED ROUTES

ROUTE	2020 DAILY BOARDINGS	2035 DAILY BOARDING
Circulator 1 (Santa Monica/Olympic)	8,914	7,741
Circulator 2 (Wilshire/Montana)	3,678	7,065
Encino Express Commuter Bus	1,337	963
Long Beach Express Commuter Bus	2,953	2,847
Metro Expo Line	(174)	1,135
Total	**16,708**	**19,751**

Table 4-13

DAILY NEW TRANSIT RIDERS

	2020 DAILY BOARDINGS	2035 DAILY BOARDING
Onto New/Proposed Routes	2,586	5,464
Onto Existing Routes	1,571	538
Total	**4,157**	**6,002**

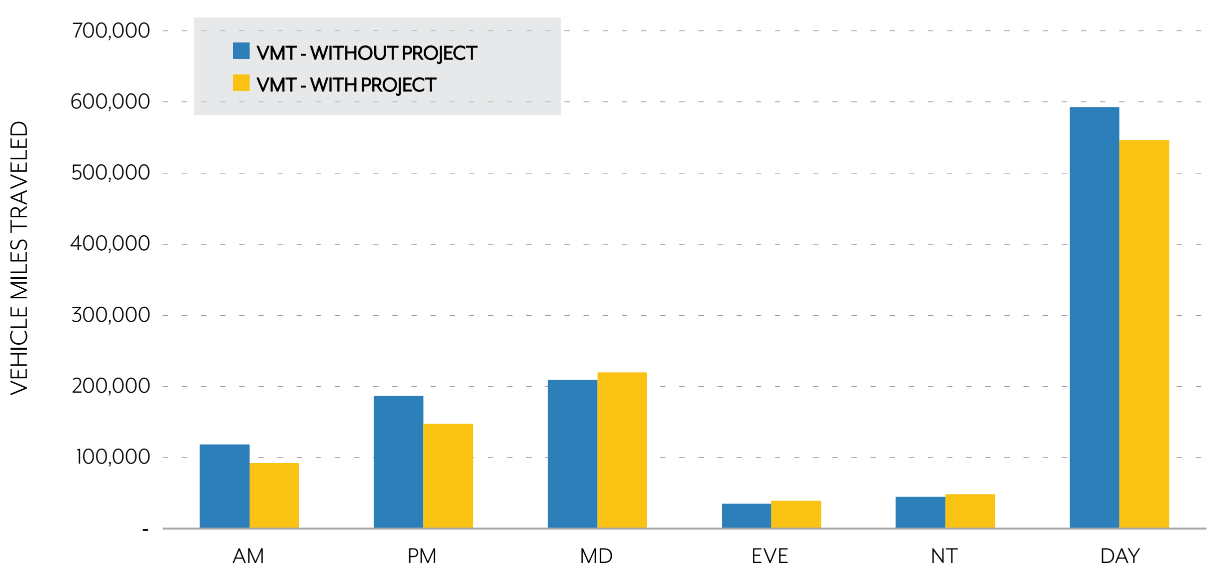
Table 4-14

VMT BY TIME OF DAY (2020)

	AM	PM	**Peak**	MID-DAY	EVENING	NIGHT	**Off-Peak**	**Daily**
VMT (without Project)	118,365	186,294	**304,659**	208,995	34,763	44,493	**288,251**	**592,910**
VMT (with Project)	91,872	147,500	**239,372**	219,560	38,902	48,286	**306,748**	**546,120**
VMT % Change	-22.4%	-20.8%	**-21.4%**	5.1%	11.9%	8.5%	**6.4%**	**-7.9%**

Figure 4-21

VEHICLE MILES TRAVELED (VMT) BY TIME OF DAY (2020)



As shown in Table 4-18, the CP3 vehicle trips increased by 51% under the CP3 Free scenario as people shift into higher occupancy vehicles and do not look for alternative routes, as shown by the minimal reductions in SOV and CP2 vehicles. The overall vehicles crossing boundary points during the peak periods increase by 6%. A similar approach was used to derive the vehicle trips for the CP3 Free scenario for the year 2035 and resulted in very similar results. For 2035 analysis, the CP3 increase was only 47% but SOV, CP2, and total autos remained the same percentage changes as 2020.

The overall vehicles crossing the boundaries during the peak periods increase by 6% with the introduction of a CP3 policy, but the average occupancy per vehicle similarly increases. This shows that drivers will shift to higher occupancy modes if incentivized to, but as they simultaneously shift to a free mode of travel into the Mobility Go Zone, there will be a reduction in revenue, which is discussed in more detail in Section 5.5.

Table 4-15

VHT BY TIME OF DAY (2020)

	AM	PM	**Peak**	MID-DAY	EVENING	NIGHT	**Off-Peak**	**Daily**
VHT (without Project)	5,071	8,710	**13,781**	8,486	1,233	1,525	**11,244**	**25,024**
VHT (with Project)	3,858	6,646	**10,504**	9,077	1,393	1,655	**12,125**	**22,629**
VHT % Change	-23.9%	-23.7%	**-23.8%**	7.0%	13.0%	8.6%	**7.8%**	**-9.6%**

Figure 4-22

VEHICLE HOURS TRAVELED (VHT) BY TIME OF DAY (2020)

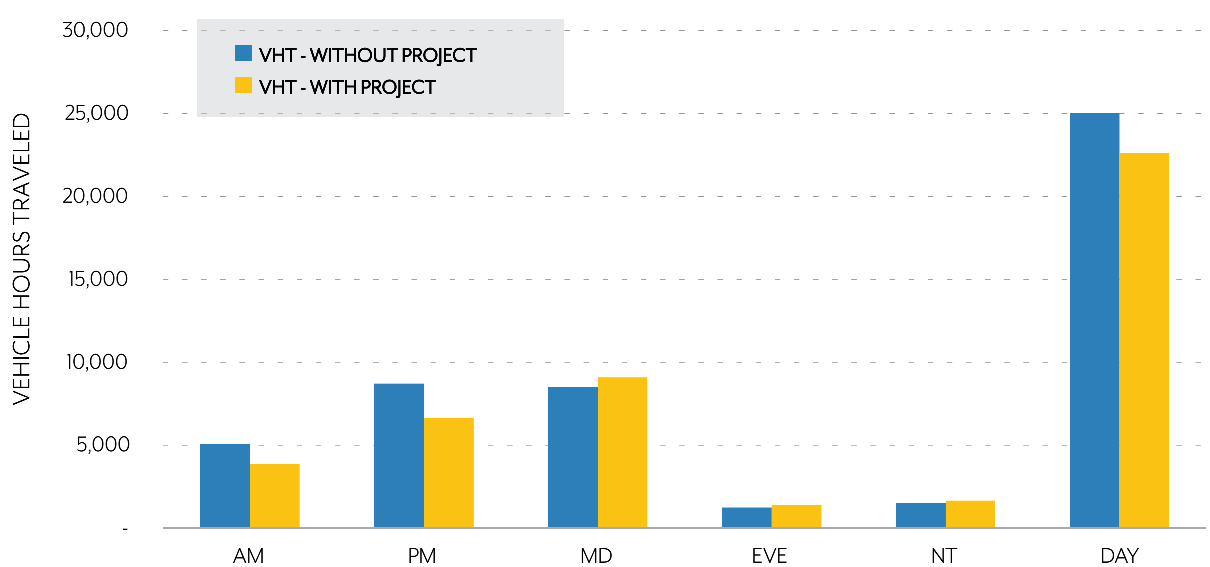


Table 4-16

VMT BY TIME OF DAY (2035)

	AM	PM	**Peak**	MID-DAY	EVENING	NIGHT	**Off-Peak**	**Daily**
VMT (without Project)	122,158	195,414	**317,572**	224,393	37,389	48,293	**310,075**	**627,649**
VMT (with Project)	95,138	156,078	**251,216**	235,255	41,776	52,257	**329,288**	**580,503**
VMT % Change	-22.1%	-20.1%	**-20.9%**	4.8%	11.7%	8.2%	**6.2%**	**-7.5%**

Figure 4-23

VEHICLE MILES TRAVELED (VMT) BY TIME OF DAY (2035)

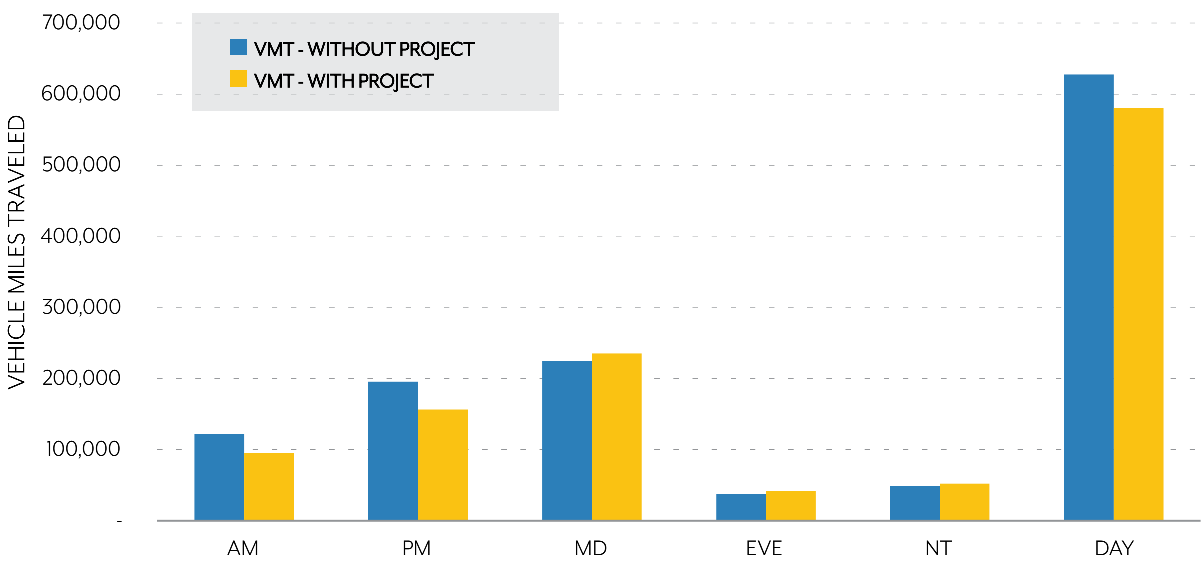


Table 4-17

VHT BY TIME OF DAY (2035)

	AM	PM	**Peak**	MID-DAY	EVENING	NIGHT	**Off-Peak**	**Daily**
VHT without Project)	5,297	9,529	**14,826**	9,397	1,335	1,653	**12,385**	**27,212**
VHT (with Project)	4,006	7,286	**11,292**	10,104	1,510	1,790	**13,404**	**24,696**
VHT % Change	-24.4%	-23.5%	**-23.8%**	7.5%	13.1%	8.3%	**8.2%**	**-9.2%**

Figure 4-24

VEHICLE HOURS TRAVELED (VHT) BY TIME OF DAY (2035)

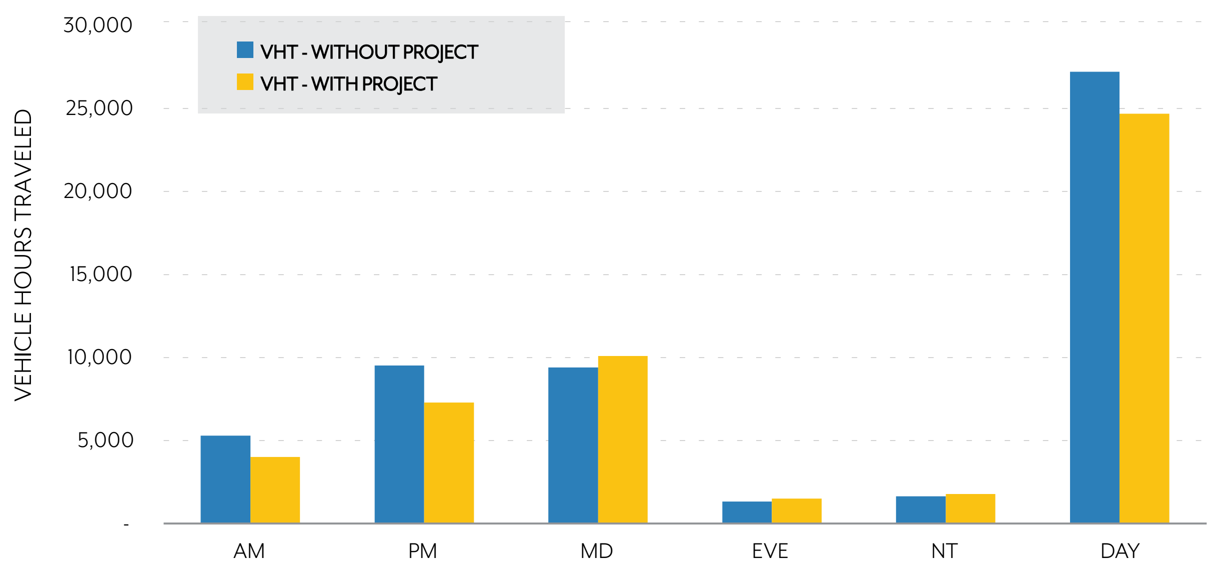


Table 4-18

PEAK PERIOD VEHICLE TRIPS CROSSING BOUNDARY POINTS FOR CP3 FREE SCENARIO (2020)

TOTAL AM + PM	SOV	CP2	CP3	TOTAL AUTOS
Vehicles ($1.5)	61,448	12,018	14,152	87,618
Vehicles (CP3 Free)	59,847	11,624	21,349	92,821
% Change	-3%	-3%	51%	6%

4.5 ECONOMIC ASSESSMENT

The economic assessment within this section examines the economic benefits and costs of the Mobility Go Zone Program relative to a base case (or no-build) scenario. These benefits and costs are expressed partly through a cost-benefit ratio and a net present value figure that captures the additional transportation-user benefits, the environmental outcomes and the capital and operating costs of the project over a given time frame. The Multiple Account Evaluation (MAE) approach used to analyze these impacts provides a way of considering other economic development and social/community impacts, which cannot be quantified (or if quantifiable, cannot be added to the cost-benefit analysis to avoid double-counting).

METHODOLOGY

The MAE approach represents the tool of choice for assessing the effectiveness of congestion mitigation measures from an economic perspective. It provides considerable flexibility in building a comprehensive analysis, while maintaining the rigorous standards recognized in the transportation economics community. This flexibility is exhibited in two important ways.

First, the MAE approach provides the analytical tools to test whether there is a clear basis for proceeding with the funding and implementation of the project from a public-sector perspective. These analytical tools consist of comparing the additional costs arising from the project against the incremental transportation-user benefits and environmental outcomes. The net present value (NPV) measure provides the value of benefits net of all costs, while the benefit-cost ratio offers an indication of the economic return per dollar of investment. For the purpose of the economic assessment, impacts accruing outside the study boundaries and outside the hours during which the decongestion fee assumed to be in effect are taken into account in the overall evaluation of mobility benefits. The dollar figures are presented in 2014 currency and the values for the full 16-year time horizon from the potential start date (2020) through to the forecast date (2035) are discounted back to a single value using a real discount rate of 4%.[18]

Second, the MAE approach provides a way of considering other economic costs and benefits, which are not included in the narrow economic test captured by the NPV and benefit-cost measures. The economic development and social and community accounts describe the economic costs and benefits that cannot be quantified and monetized; and the economic impacts which are not strictly incremental relative to the base case and hence cannot be added to the other monetized costs and benefits. These include qualitative factors such as the ability to shape land-use and impacts on socio-demographic groups. They also include quantitative factors, such as changes in short-term and long-term employment and GDP impacts of the project as well as the impact of the project on business competitiveness.

All transit improvements listed in Section 3.2 are included in this analysis, including the two circulator routes, two express commuter buses, and change in headways for bus routes directly serving the area. An average inbound decongestion fee of about $3.00 is assumed during AM and PM peak periods only. Opening year for the project is considered 2020 with forecast year of 2035. Interim annual figures were estimated through linear extrapolation and annualization factors of 255 days for autos, trucks and express bus services and 300 days for study area circulator and existing transit services.

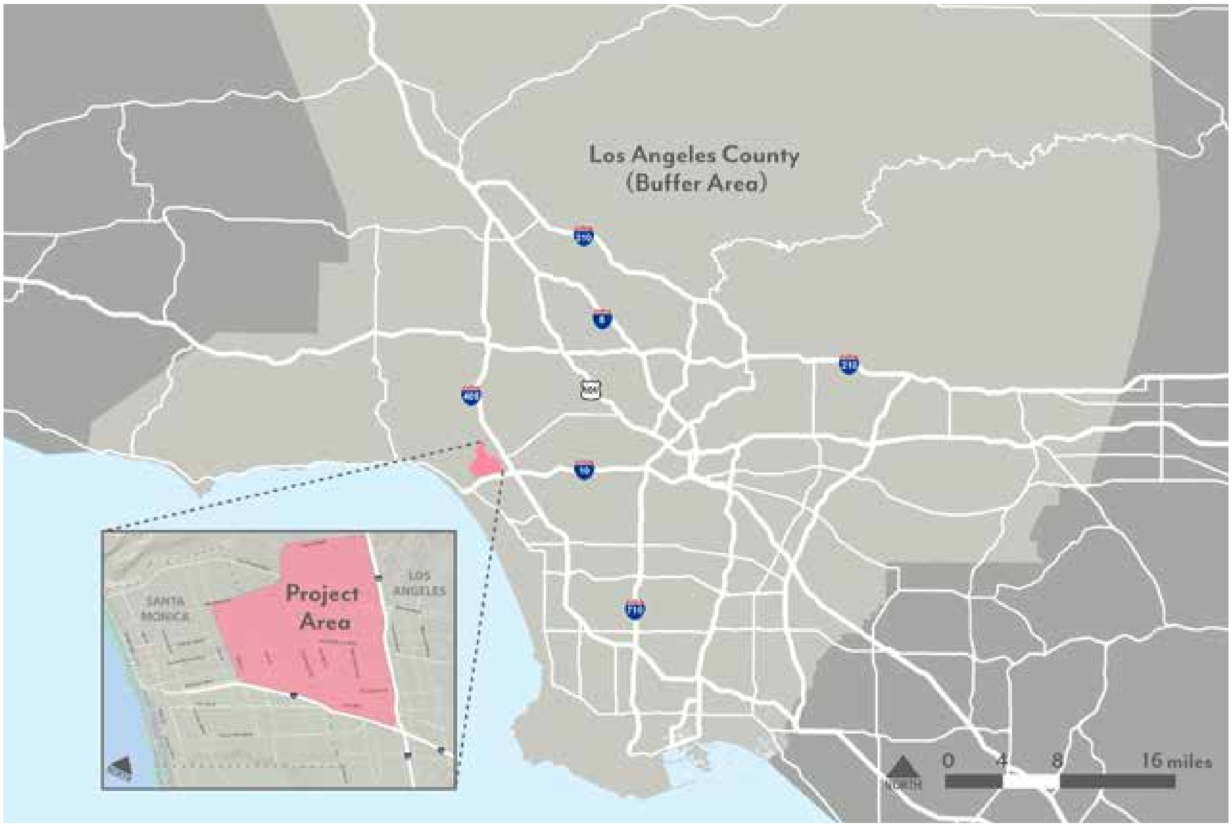
GEOGRAPHIC STUDY AREA

The earlier analysis showed that the study area differs from other regions where successful cordons or area charges have been implemented in that, while a destination, it also has considerable through traffic due to the polycentric nature of the greater Los Angeles area. Through trips, for which the origin and destination are outside the study area, present an opportunity and a challenge for this project. The opportunity lies in reducing the number of through trips and thereby reducing peak period congestion without adversely affecting accessibility to employment or retail opportunities in the study area. Doing so improves travel times for trips destined to the Mobility Go Zone. Therefore, the study area for the economic analysis includes both the pilot program area itself as well as the results for all of LA County, as illustrated in Figure 4-25. The benefit-cost analysis is performed for the entire County, which encompasses the study area.

18 The 4% discount rate is consistent with SCAG's RTP/SCS and represents the time value of money after adjustment for inflation.

Figure 4-25

MOBILITY GO ZONE BOUNDARIES



Source: AECOM

ASSESSMENT AND KEY FINDINGS

The Mobility Go Zone Program is expected to improve mobility and transportation-user experience in the study area and in LA County as a whole. In practice, this means people will enjoy travel time savings to get to their respective work, leisure, school or other destinations. A weekday peak-period decongestion fee combined with the proposed transit improvements will reduce auto usage. This provides the basis for more efficient use of existing road capacity, because it enables users with time-sensitive trips to travel to their destination more quickly and more reliably. It also encourages greater use of public transit, which is a higher-capacity mode of transportation well suited to an urban area with increasing employment and residential population. The decongestion fee also encourages active transportation for shorter trips.

The benefit-cost analysis shows that the project results in net value creation over the 16-year time horizon. Overall, the benefits amount to $993 million in present value terms over the whole period. After factoring in capital and operating costs of $326 million, the project creates economic value of $667 million in present value terms. The economic feasibility of the Mobility Go Zone Program can also be represented by the benefit/cost ratio of 3 to 1 relative to the base case.

The main transportation user benefits for this project consist of travel time savings for motorists travelling in LA County, combined with improved travel time reliability. In other words, the project will allow auto users to spend less time in their vehicles and will result in a lower likelihood that they arrive late to their destination.

In addition to the above benefit-cost results, an analysis of the economic development impacts shows that the Mobility Go Zone Program capital spending will support $25.9 million in output and $8.3 million in earnings in Los Angeles County alone. In addition, the operating expenditures are expected to support the following impacts on an annual basis: 464 jobs, $54 million in output and $25 million in wages and salaries. Other economic development impacts can take the form of a higher standard of living for people who live or work in the area (e.g., wider range of job opportunities and/or a higher take-home pay) and productivity gains for businesses located in the study area. Productivity gains will be achieved through more attractive street-level conditions which are more conducive to retail activity, business meetings, and other commercial activities and through lower operating costs resulting from the improved mobility.

Table 4-19

TRAVEL TIME IMPACTS RELATIVE TO BASE CASE

	TRAVEL TIME SAVINGS (PERSON HOURS OF TRAVEL, MILLIONS)		VALUE OF TRAVEL TIME SAVINGS (PRESENT VALUE, 2014$ MILLIONS)	
	ANNUAL (AVERAGE)	TOTAL (16 YEARS)	ANNUAL (AVERAGE)	TOTAL (16 YEARS)
Motorists				
Auto	4.9	78.9	38.1	609.0
Truck	0.01	0.2	0.2	3.2
Reliability Benefits			9.6	153.0
Transit riders				
Wait Time Reductions	0.4	6.0	11.8	189.1
In-vehicle Travel Times	-0.1	-1.1	-0.6	-9.0
Total	**5.3**	**84.0**	**59.1**	**945.3**

Finally, the analysis anticipates that the project will have positive impacts on livability in the study area as it will make streets more attractive to pedestrians, thus helping foster greater community interactions. Analysis of the social and community impacts also suggests that a reduction in parking demand resulting from the modal shift to transit and active transportation may allow city planners to modify the built environment in the study area and promote higher-density residential and commercial developments in the future. The economic value (or opportunity cost) of the freed-up parking spaces is estimated at $2.2 million per year. However, these benefits are not included in the benefit-cost analysis.

TRANSPORTATION USER BENEFITS

Travel Time Impacts

On average, travel time savings for all users, including transit users, amount to 5.3 million person-hours per year for a total of 84 million over the 16-year period. Overall, with the implementation of the pilot program, the reduction in travel times will result in savings of approximately $59 million per year on average for a total of $945 million between 2020 and 2035. The travel time savings are driven by the reduction of travel times on arterial roadways within the study area as well as travel time savings on regional highways used to access the area. Table 4-19 presents the incremental travel times for all transportation users in LA County and the results are explained in detail below.

Travel Time Reliability Impact for Motorists

Another benefit associated with travel time savings is improvements in travel time reliability. Alleviating traffic congestion results in a lower likelihood that motorists arrive late to their destination (e.g., their workplace or shipping destinations). Transportation users typically attribute a value to such an increase in reliability, which is over and above any change in time savings. Improved reliability generates a benefit of $9.6 million annually for a total of $153 million over the time horizon.

Travel Time and Related Impacts for Transit Riders

Current transit users in LA County are better off as a result of the combined decongestion fee and the improvement in transit services due to the reduction in wait times from the higher service frequency and coverage for transit services.

Although new transit riders diverted away from auto use may sustain travel time penalties relative to the time it would have taken to do the same trip by car, they are necessarily better off (or at least not worst off) after switching from auto, because the travel model generates a change in mode choice when users are able to reduce their generalized transportation costs (i.e. combined out-of-pocket and time costs). Consequently, although users switching to transit may sustain travel time penalties, the value of these travel delays must necessarily be more than offset by a reduction in other components of the generalized travel costs, otherwise they would not have switched. However, as consumer surplus for new transit riders is not estimated in the model, the transportation-user benefits are underestimated for new transit users.

Travel time savings are monetized and added to the other monetized benefits in order to compare overall benefits to the capital and operating costs and thereby arrive at a single (benefit-cost) measure of whether the project passes the economic feasibility test. The time values used in the analysis were adjusted to 2014 values. Wait time reductions and in-vehicle travel times result in a combined benefit of $11.2 million annually and $180 million over the time horizon.

Vehicle Operating Costs

The distances traveled within the program area decline by 12 million VMT on average each year. Nevertheless, the potential for diverted traffic should be explored further if the pilot project is pursued and any mitigation strategies could draw from lessons learned in international case studies.

Safety Impacts

The introduction of the Mobility Go Zone Program has a positive impact on road safety outcomes driven by a combination of the incremental VMTs for auto and truck users in the County and the VMTs saved by former drivers who switch to transit, which results in net VMT savings. The overall reduction in VMTs within the study area results in a social benefit of $140,000 per year, for a total present value of $2.2 million over the whole period.

ENVIRONMENTAL ACCOUNT

The Mobility Go Zone Program would lead to improvements in air quality in the study area amounting to annual benefits of $4 million for a total of $66 million over the 16-year period. The analysis takes into account trend reductions in the rate of emissions of greenhouse gases (GHG) and criteria air contaminants due to running exhausts (i.e. carbon monoxide (CO), nitrogen monoxide (NO), particulate matter (PM10 and PM2.5), and reactive organic gases (ROG)). The analysis also includes reductions in PM10 and PM2.5 due to less brake and tire wear. The emission rates are drawn from the Mobile Source Emissions Inventory (EMFAC 2014) published by the California Air Resources Board and take into account improvements in the energy efficiency of the vehicle fleet throughout the period.

PROJECT COSTS

The project cost account captures all the direct outlays incurred for the project. In particular, it includes capital, operating, and maintenance expenses for the program as well as for the improvements in transit services. A full financial analysis is available in Chapter 5. Table 4-20 summarizes all the quantifiable costs of the project in NPV.[19]

The capital costs for the Mobility Go Zone Program include field and central hardware costs and software costs. All capital outlays related to the decongestion fee are assumed to be spent in 2019. Capital costs for transit improvements consist of the additional rolling stock for the new bus routes. Almost half the capital costs in transit (i.e. rolling stock) are assumed to be spent in 2019 and the remainder is reinvested in 2031. For the latter, a residual value of $7.0 million (in present value terms) was included in 2035 and calculated assuming a linear depreciation of the reinvestment between 2031 and 2035.

The operating and maintenance costs cover the ongoing costs for collecting the decongestion fee and providing the additional transit services. The operating and maintenance costs have been allocated for each year, beginning once the pilot program and additional transit services are in use in 2020. The operating costs are divided between capital maintenance costs and decongestion fee collection costs.

COST-BENEFIT RESULTS

The economic assessment indicates that the Mobility Go Zone Program meets the objectives set out to reduce through trips and to improve transit services and overall mobility in one of the region's most congested areas. The presence of a decongestion fee combined with the proposed transit improvements reduces auto trips and increases transit trips, alleviates congestion, reduces travel times for motorists and result in a lower likelihood that motorists or truck drivers arrive late to their destination. The reduction in auto trips also improves safety outcomes and reduces GHG emissions.

In total, the economic benefits amount to $993 million in present value terms (2014 currency) over the analysis period, as shown in Table 4-21. After factoring in capital and operating costs of $326 million, the Mobility Go Zone Program creates economic value of $667 million in NPV terms. The economic feasibility of the Mobility Go Zone Program can also be represented by the benefit/cost ratio of 3 to 1, relative to the base case.

Overall, with the implementation of the Mobility Go Zone Program, the travel time savings would be worth $60 million per year on average for a total of $945 million over the 16-year analysis period.

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19 The economic benefit-cost analysis relies on the same project costs used in the financial cash flow analysis in Chapter 5. However, the reported figures vary between the two analyses for several reasons. First, in the economic assessment, all costs and benefits are stated in 2014 dollars. The economic analysis controls for inflation using a 4% real discount rate which represents the time value of money after adjustment for inflation. In contrast, the financial cash flow analysis applies a 2% annual inflation rate to the estimated costs and uses a 6% nominal discount rate. Second, the economic analysis considers a residual value for capital investments at the end of the 16-year period, which is not included in the financial analysis.

ECONOMIC DEVELOPMENT IMPACTS

The economic development account first captures the economic impacts that may be generated by the Go Zone Mobility Program expenditures. These impacts present a valuable picture of how economic activity could be affected by the project by showing how the construction and operation spending translates into jobs, income and output. Second, the economic development impacts of the project also comprise the improvements in the standard of living of those who live and work in the area and productivity gains for local businesses.

Economic Impacts of Project Spending

The regional economic impact analysis describes the output, earnings, and employment that may be generated as a result of the Mobility Go Zone Program expenditure. The analysis presents the impacts that are expected to occur within the county of Los Angeles, the state of California, and the United States as a whole. Impacts include both the temporary impacts expected to accrue to respective regions as a result of the capital outlays related to the project, and the recurring annual impacts resulting from the operations of the decongestion fees and additional transit services. These impacts cannot be added in monetary terms to the benefits reported under the transportation-user account due to likely double-counting.

Economic Impacts of Capital Spending

The temporary economic impacts capture the effects of the $61.0 million (2014$, undiscounted) investment in capital spending for the field and central hardware and software and in the transit vehicles required for the new circulators and express routes. These impacts are temporary in that they are limited to the periods when the spending takes place, i.e. $37.0 million in 2019 (prior to the service launch) and $24.0 million in 2031 when 48 additional buses are assumed to be purchased.

Economic impacts can be thought to represent the footprint of the project. These impacts show how each dollar spent in a specific region translates into jobs, wages and salaries, and output in that same region. The spending that occurs outside the respective regions are called leakages and these need to be removed from the direct spending that drives the impacts in a region. For example, the impacts of the capital expenditure on buses would tend to be felt at the location of the manufacturing plants for these vehicles. Since there are no bus manufacturing plants in LA County, buses are not likely to be manufactured in the region, but could be manufactured in one of California's bus manufacturing plants. It is assumed that all materials, equipment and supporting services will be provided within the United States.

Table 4-22 reports the regional expenditures based on the regional rate of capture and the temporary economic impacts of undertaking the project over the analysis period. The direct and indirect impacts generated during the implementation of the Mobility Go Zone Program represent a change in output of $21.2 million for LA County. It includes the initial change in demand for output, or direct effect, of $16.1 million; the remainder represents the indirect effect resulting from all the additional rounds of spending undertaken to source all the intermediate inputs for the delivery of the final goods and services. The additional output sustains 85 full- and part-time jobs in LA County and gross employee wages and salaries of $6.6 million.

These wages and salaries earned by the workers engaged in the delivery of the project will tend to be spent on other goods and services. The impacts of this additional spending are called induced effects. In LA County, for example, the induced effects result in $4.6 million worth of output, which translate

Table 4-20

PROJECT COST SUMMARY

COST CATEGORY	NPV, 2014$ MILLIONS
Capital Costs	**$35.7**
Fee Collection Infrastructure Capital Costs	$10.7
Transit Capital Improvements	$25.0
Operating Costs and Maintenance	**$290.0**
Annual Capital Maintenance Costs	$5.5
Fee Collection Costs	$153.7
Transit Improvements Operating Costs	$130.7
Total	**$325.7**

Table 4-21

SUMMARY OF COST-BENEFIT RESULTS

	NPV, 2014$ MILLIONS
Life-Cycle Benefits (A)	$993
Life-Cycle Costs (B)	$326
Net Present Value (A-B)	$667
Benefit / Cost Ratio (A/B)	3.0

into 34 jobs and $1.6 million in earnings. The total impact of the capital spending is the sum of the direct, indirect, and induced effects. Impacts increase as the study area is expanded to include the state of California and the U.S.

Economic Impacts of Operations and Maintenance Activities
The long-term economic impacts capture the effects of operating the fee collection system and the additional transit services. These impacts occur on an annual basis as long as the Mobility Go Zone Program is in operation. For the purpose of this study, the analysis presents the results for the first 16 years of operation. The majority of the operation and maintenance expenditures are assumed to accrue locally, which means there are no leakages and a rate of regional capture of 100% is applied to all regions for all expenditure categories. The total operating expenditure over the period of analysis amounts to $476 million in undiscounted 2014 dollars, with an average annual spending of $30 million.

Table 4-23 reports the recurring annual economic impacts of operating expenditures of undertaking the project over the analysis period. For LA County, the average annual direct and indirect recurring impacts amount to approximately $40.4 million in output, $20.1 million in incomes and 367 jobs. As mentioned, the induced effects consist of impacts from employee spending in the regional economy. When the induced effects are included, the overall impacts rise to 464 jobs, $24.9 million in incomes and $54.4 million in output for each year of operation. Impacts increase slightly as the study area is expanded to include the state and the U.S. The increases in impacts from LA County to the state of California and on to the country as a whole are smaller than for the capital expenditure because most of these impacts are expected to be felt in LA County and the surrounding region.

Table 4-22

TEMPORARY ECONOMIC IMPACTS OF CAPITAL EXPENDITURE (2014$ MILLIONS, UNDISCOUNTED)

	LOS ANGELES COUNTY	CALIFORNIA	UNITED STATES
Regional Expenditure (2014$ M)	$16.1	$36.5	$61.0
Direct and Indirect Effects			
Output (2014$ M)	$21.2	$53.0	$137.8
Earnings (2014$ M)	$6.6	$12.5	$27.9
Jobs	85	169	404
Induced Effects			
Output (2014$ M)	$4.6	$11.4	$40.7
Earnings (2014$ M)	$1.6	$3.9	$12.7
Jobs	34	77	265
Total Effects			
Output (2014$ M)	$25.9	$64.4	$178.4
Earnings (2014$ M)	$8.3	$16.4	$40.6
Jobs	118	246	669

Source: AECOM Analysis based on IMPLAN Group LLC I-RIMS Multipliers. Impacts in larger jurisdictions are inclusive of smaller jurisdictions

Economic Impacts of Projects Funded by Mobility Go Zone Revenues

The Mobility Go Zone Program is expected to generate total net revenues of $450 million (in 2014$, present value) over the analysis period. These revenues would be reinvested in local projects to further improve livability and transportation conditions. The expenditures for these projects will thus generate additional economic impacts. The analysis does not quantify these impacts since the specific projects are not known at this time.

Improving Living Standards and Business Competitiveness

In addition to the economic impacts associated with the Mobility Go Zone Program expenditures, the economic development impacts of the project can take the form of a higher standard of living for people who live or work in the area and productivity gains for businesses located in the study area. These benefits go beyond the direct travel time and vehicle operating cost savings reported under the transportation user account.

A higher standard of living for people can take the form of a wider range of job opportunities for workers and/or a higher take-home pay. For businesses, productivity gains, defined as an increase in output per dollar of inputs, are achieved through more attractive street-level conditions which are more conducive to retail activity, business meetings, and other commercial activities. Productivity gains are also achieved when businesses produce the same amount of output using fewer resources. For example, the travel time savings and reliability improvements are expected to translate into production cost savings resulting from various factors including more efficient labor markets (e.g., due to improved access to qualified labor), improved efficiency of

Table 4-23

RECURRING ANNUAL ECONOMIC IMPACTS OF OPERATING EXPENDITURE (2014$ MILLIONS, UNDISCOUNTED)

	LOS ANGELES COUNTY	CALIFORNIA	UNITED STATES
Direct and Indirect Effects			
Output (2014$ M)	$40.4	$41.5	$44.6
Earnings (2014$ M)	$20.1	$20.7	$21.7
Jobs	367	368	384
Induced Effects			
Output (2014$ M)	$14.0	$18.7	$31.2
Earnings (2014$ M)	$4.8	$6.2	$9.6
Jobs	97	121	195
Total Effects			
Output (2014$ M)	$54.4	$60.1	$75.9
Earnings (2014$ M)	$24.9	$26.9	$31.3
Jobs	464	489	580

Source: AECOM Analysis based on IMPLAN Group LLC I-RIMS Multipliers. Impacts in larger jurisdictions are inclusive of smaller jurisdictions deliveries and the overall supply chain and other cost savings. Ultimately, this means that the area becomes more attractive either as a residential location for individuals and/or as a business location for firms.

This section presents a qualitative assessment of the improvements in standard of living and business productivity associated with the Mobility Go Zone Program in terms of: retail trade competitiveness, labor market accessibility, efficiency of goods and service deliveries, and other business production costs. The discussion is based on anecdotal evidence from the Business Focus Group conducted in July 2015 and on evidence observed in other jurisdictions where similar projects are in place. The focus group interviewed owners or employees from ten storefront shops located within the study area. Respondents included representatives from the service sector, restaurants, and retail stores.

Retail Trade Competitiveness
At first glance, the Business Focus Group respondents felt the decongestion fee would be bad for business as it would deter patrons. However, after taking a closer look at the concept and assessing the current traffic conditions in the area, the group recognized that the Mobility Go Zone Program could have neutral or even positive impacts on sales and revenues. Most respondents agreed that congestion is the most serious problem facing the study area today from a business perspective. Most respondents claimed that traffic congestion has negative impacts on their business since patrons are less likely to stop by retail outlets in the presence of congestion. Some respondents also observed that sales drop between 5 PM and 8 PM on weekdays, which coincides with congestion in the evening rush hour.

This anecdotal evidence suggests that the morning peak decongestion fee will have no impact on most retail businesses, as the majority open after the end of the AM peak period. During the PM peak period, the reduction in congestion may have a positive impact on businesses since respondents claimed that the most important deterrent to business at that time is arterial traffic in the study area. One respondent argued that though patronage slows down, some customers still do come in during the PM peak period and the decongestion fee might have a negative impact on them, but this same respondent admitted that these customers are mostly people working close-by and stopping in on their way home. Hence, the inbound decongestion fee would have no effect on these patrons. The patrons that could be discouraged are those that enter the study area during the peak period and who cannot change their travel time or for whom the benefit of travel time savings and improved traffic flow do not offset the cost of the fee. In response to the fall in patronage during the afternoon peak hours, many respondents have already changed their business hours, opening later in the morning (e.g. 11 AM instead of 9 AM) and staying open later at night (e.g. 10 PM instead of 9 PM). Hence, by alleviating congestion, the Mobility Go Zone Program could reduce the costs borne by business owners that have had to adapt to current congestion problems in the area. This would represent a local productivity improvement.

Finally, increasing cyclist and pedestrian activity in commercial sectors increases footfall and, in turn, can increase sales. Although customers who bike or walk to a store tend to buy less in a single visit, they tend to return more often, spending as much or more over time than the average customer who arrives by car. Also, pedestrians and cyclists are more susceptible to shop locally. Extensive analysis of the impacts of the Central London Congestion Charge and the Stockholm Congestion Tax suggests that in both cases the retail sector recorded a stronger year-on-year business performance than similar businesses outside the charging zones following the introduction of the cordon charge and retail footfall remained stable.

Labor Market Accessibility
As a result of the improvements in travel times, transit coverage and frequency, and cycling and pedestrian conditions, the Mobility Go Zone Program improves overall accessibility to the study area. In highly congested metropolitan areas, some businesses incur higher labor costs in the form of higher wages to compensate workers for high commuting costs, take longer to fill job vacancies, and/or some vacancies could remain unfilled (or filled by less appropriate workers). Travel cost savings and improved accessibility may provide businesses with access to a larger pool of labor to fill vacancies more easily and, in some cases, allows them to have easier access to a greater diversity of skilled labor without bearing the payroll costs needed to attract such workers and other costs associated with unfilled vacancies or poor worker-job matches. In time, firms may also consider relocating or establishing their business in the area to benefit from the comparative advantage, thus furthering the economic development of the area. It is also worth noting that these benefits accrue to all sectors of the economy. Public sector or non-governmental organizations may also benefit from having access to a larger labor catchment area.

According to the Business Focus Group participants, many of their employees and co-workers live outside the area and rely on public transit for their commute. Due to traffic delays, some workers show up early to work to avoid traffic, sometimes as much as one or two hours before beginning their shift. For these workers, travel time savings and improvements in reliability may lower the costs they bear to adapt to current congestion levels. By alleviating the transportation constraints, the decongestion fee may also make the study area a more attractive location for employees that are not currently willing to bear these time costs, thus providing access to a larger regional pool of labor.

The transportation-user benefits of the Mobility Go Zone Program suggest that on any given day the program encourages close to one thousand person trips to shift to transit and active transportation modes. A recent study demonstrates that getting workers to walk or bike on their commute to work makes them healthier and more productive. As companies seek ways to lower health care costs, employees who exercise during their commute help boost overall hourly productivity and reduce healthcare costs borne by employers. Directly or indirectly, employers that save on health care costs for their employees tend to pass the savings on in the form of higher wages and/or lower prices.

Efficiency of Goods and Service Deliveries
Congestion and reduced travel time reliability tend to undermine the productivity of goods movement and ultimately hinder the ability of businesses to deliver their products or services to their customers. The interference in delivery systems can also impose additional inventory costs. Nine out of ten focus group respondents indicated their reliance on deliveries, either receiving goods and/or shipping to customers. Over time, many have changed their pickup and delivery schedules to avoid uncertainties and delays caused by congestion. This can also affect the size and nature of business organizations, production processes and customer markets served.

In the context of sub-optimal delivery schedules and overall inefficient business-to-business travel in the study area, the congestion relief provided by the pilot program enables businesses and shippers that rely on the area streets to reduce the adjustment costs that they have had to bear as a result of the chronic peak period congestion. This could take the form of lower inventories and possibly less time spent planning and delivering goods or services. In cases where time-sensitive deliveries need to occur during the peak period, the delivery will be subject to increased out-of-pocket costs, but would be offset by the travel time savings and increased travel time reliability experienced by the delivery person. The time-sensitive nature of the delivery would imply a relatively high time value and hence a likelihood that the overall delivery process is more efficient in terms of overall time and money costs. Policies related to goods movement should be explored further to identify complementary delivery strategies in and around the study area.

Other Business Production Costs
Modal shift away from single-occupancy vehicle trips as a result of the Mobility Go Zone Program lowers the demand for auto parking. Lower parking requirements translate into savings for firms through a reduction in employer-provided parking spaces and for shops that offer parking to their patrons. This is another concrete example of how lower business expenses – in this case, due to reduced parking costs – contribute to improving local and regional productivity.

Land value uplift is another potential impact resulting from the time and cost savings which accrue to the affected transportation users in the study area. These users essentially “spend” the accrued time and cost savings on higher property values in the areas that benefit from the increased accessibility. In addition, properties on streets which experience significant congestion relief may also benefit from uplift in property values by becoming a more attractive residential or business location.

In order to achieve improved competitiveness, the magnitude of the improvements in standard of living (or productivity) must be greater than the decongestion fee that is borne by an individual (or business). In instances where the value of travel time savings and improvements in travel time reliability are not greater than the decongestion fee, individuals or businesses affected may have an incentive to relocate their economic activities to off-peak hours. This could well happen for certain activities which are considered time-insensitive, such as leisure activities or visiting friends. In such cases, shifting those trips to non-peak hours would contribute to congestion relief and provide some flexibility to accommodate time-sensitive activities. This change in the mix of activities at peak periods should be productivity-enhancing for businesses in the study area; as well as enhancing living standards for residents. However, some residents and businesses that are able to avoid the charge by shifting activities to non-peak hours may nevertheless be worse off as a result of the associated adjustment costs.

SOCIAL AND COMMUNITY ACCOUNT

The social and community account incorporates some of the more qualitative influences that the Mobility Go Zone Program has on the livability of the study area as it will make streets more attractive to bicycles and pedestrians, thus helping foster greater community interactions, the built form of the community, as well as the social and physical impacts on lower income households.

Place-making and Livability Impacts
The Mobility Go Zone Program can achieve goals that may improve livability. Previous sections have identified and discussed many goals and performance measures linked to place-making, including supporting active transportation, contributing to improved local and regional air quality and GHG reduction goals, increasing transit ridership, improving efficiency of the road network, improving accessibility to retail, trade and work opportunities, etc. Reducing traffic during the peak hour will improve the walkability of the study area by making streets more accessible and attractive to pedestrians. Improving walkability is often associated with increased neighborhood interactions and community cohesion, public space preservation and improved aesthetics. Community cohesion refers to interactions among people in a community. It can be measured by the frequency of connections, the number of neighborhood friends, acquaintances and other social interactions.

Land Use Shaping and Intensification
By providing higher-frequency transit services, the Mobility Go Zone Program allows parking requirements in the study area to be relaxed which can result in a reduction in the amount of structured parking provided, making intensification more cost-effective and attractive to the market throughout the study area. The streets that would be subject to intensification would become even more walkable. The type of development in these areas could also provide housing and commercial diversity which can support households and businesses that may be poorly accommodated under current conditions. Another benefit associated with lower demand for parking and borne partly

by transportation users but also by society as a whole, is the economic value (or opportunity cost) of the freed-up parking spaces. The economic value stems from the reduction in demand, reducing the need to add additional parking spaces in the future or allowing for existing spaces to be converted to more productive uses.

For example, converting parking spaces to reserved lanes for buses or bike lanes can make transit more attractive, further encouraging modal shift away from private vehicles. The reduction in demand for parking is estimated based on the change in auto trips entering and traveling within the study area. The economic value of a parking space is a more challenging concept to define in practice because it refers to the opportunity cost of the parking space if it is converted to an alternative use. The average market value for a parking space within the study area was selected as a proxy. Based on an inventory of off-street public parking facilities in the area, the average daily fee was approximately $9.50. Considering that private vehicle trips from outside and inside to inside the project area will drop by 543,000 in 2020 and by 625,000 in 2035 relative to the base case scenario and assuming a ramp-up in the reallocation of parking spaces to other uses, the total benefits associated with the reduced demand for parking amount to $35.7 million in total, or an average benefit of $2.2 million per year.

4.6 EQUITY DISCUSSION AND ANALYSIS

This section is intended to describe the demographics and equity concerns for low-income populations accessing the pilot program area. This analysis is provided to better inform policies to mitigate negative impacts on low-income travelers, such as the development of a discount program for qualifying individuals.

EQUITY BACKGROUND

The pilot program is designed to charge automobile drivers a decongestion fee for entering the defined geographic boundary during AM and PM peak travel hours. Fees collected would be used to reinvest funds into public transportation including shuttles, circulators, bicycle infrastructure and improve pedestrian access to better serve transit-dependent populations. International examples of similar programs have proven successful by compelling travelers to reevaluate their travel choices. The objective of this section is to describe the characteristics of low-income populations within the proposed zone and travel behavior of low-income commuters to the zone to address policies that could provide for a more equitable program.

METHODOLOGY

Low-Income populations are defined using the 2012 SCAG RTP Travel Demand Model for categorizations of person trips. The SCAG model estimates trips for five household market segments, which are carried from trip generation through trip distribution and mode choice. This model was used for the equity analysis of the potential pilot program that focused on the category of car sufficient households (i.e., households where each worker has access to a vehicle) with incomes less than $25,000 as a standard for comparison to assess the program's ability to accommodate low-income households and therefore be equitable to most household market segments. For forecasted travel demand, opening year of the program is 2020 with a horizon year of 2035.

Population, employment, and zero-car household data, in addition to low-income and median household income data was derived using the 2015 American Community Survey (ACS) 5-Year estimates. The ACS 2015 census was used as the base year because it was the most current census information available at the time of analysis, and due to the size of the study area, the 5-year estimates provide a larger sample size with more precise geographic information for small areas and small population sizes.

LOW-INCOME ANALYSIS

Low-Income Populations

Existing demographic information by census tract for LA County and the study area are described in this section, highlighting low-income households. Figure 4-26 shows the percentage of low-income households by census tract for LA County from 2015 ACS. Figure 4-27 identifies the number of households with less than $25,000 annual income and percentage of households below the poverty level by census tract.

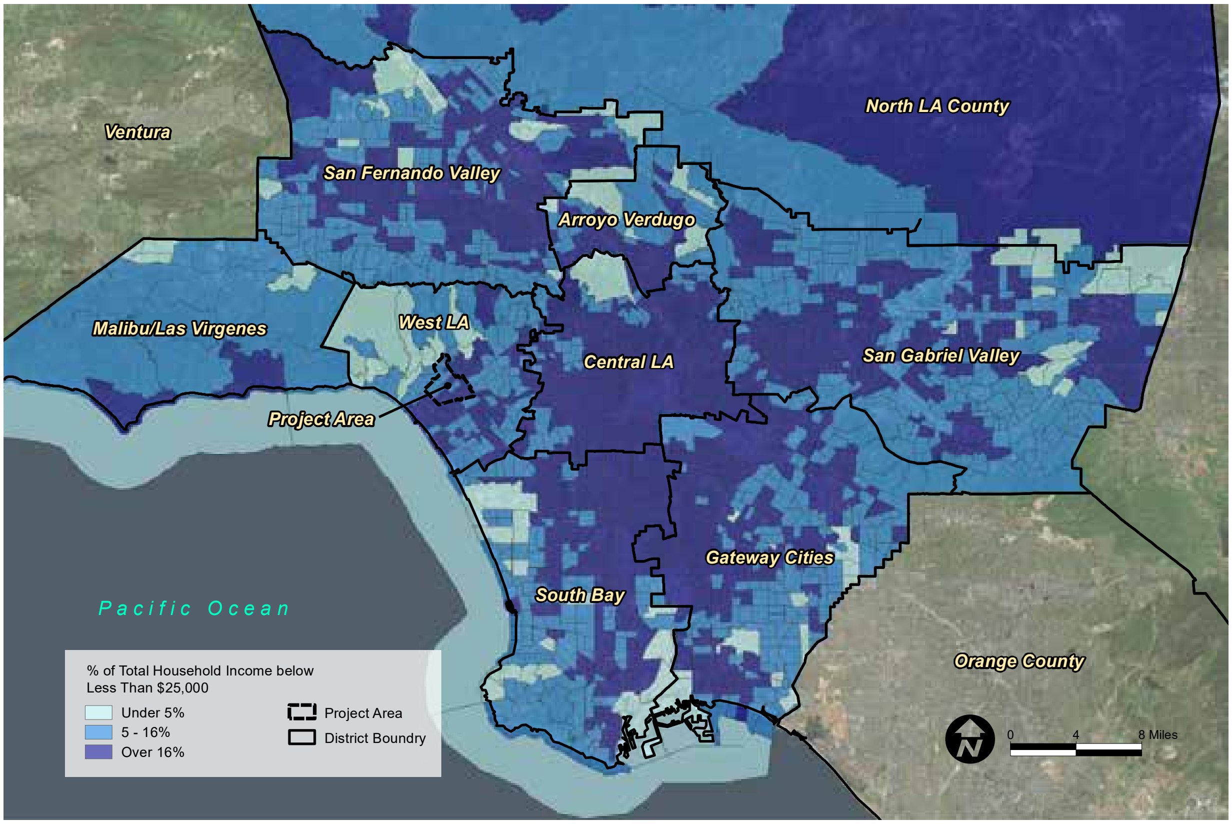
As is the case in Los Angeles and other major urban cities, average homeownership rates in the study area are generally lower than their statewide and nationwide averages. According to the 2015 ACS, fewer than 30% of the study area's housing units are owner-occupied and median per-capita gross rents are higher in all 18 census tracts, as compared to the citywide average of $1,231 per month, and 1.25 times greater than the citywide average in 13 of its 18 tracts. Similarly, the median home value of the total study area is considerably higher than the citywide average of $471,000. For example, four census tracts have homes with median values exceeding $1,000,000; in two of those tracts, the median home value is at least $2,000,000. Figure 4-28 displays the median household income by census tract within the study area.

In the study area, the median household income is roughly $80,000 with the majority of low-income households located in the southern and western portions. Across the 18 census tracts, median incomes range from $48,438 to $204,432, and 4 of the 18 census tracts have over 20% of households with incomes under $25,000. Table 4-24 displays the median household income, number of total households, and percentage of households under $25,000 income by census tract.

High housing prices in Los Angeles mean that even relatively high-income households can meet the Census Bureau's definition of housing burdened, which is defined as a household spending at least 30% of monthly income on rent or homeownership expenses. In the study area's wealthiest census tract, 27.6% of households are considered housing burdened. A more representative tract is Tract 2676, which has a median household

Figure 4-26

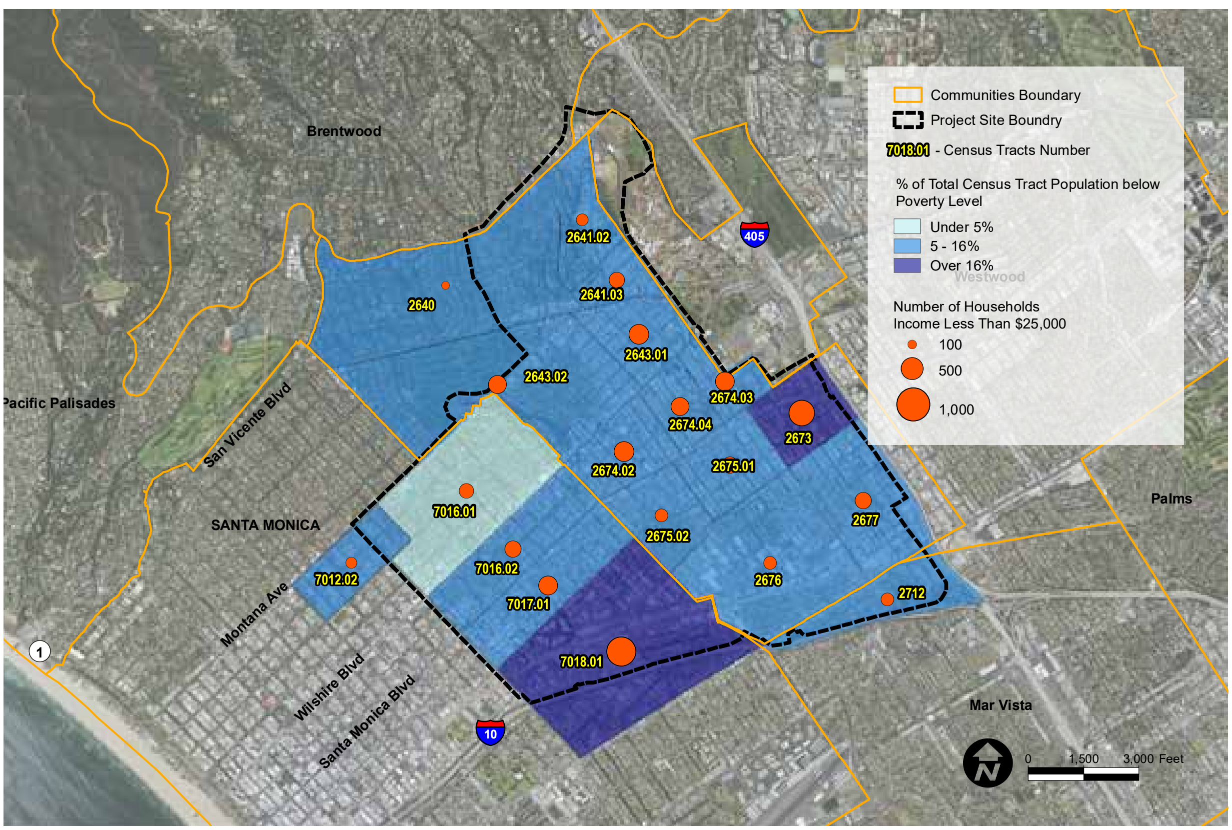
LOS ANGELES COUNTY PERCENTAGES OF LOW-INCOME HOUSEHOLDS BY CENSUS TRACT (2015)



Source: U.S. Census Bureau 2015 ACS, AECOM

Figure 4-27

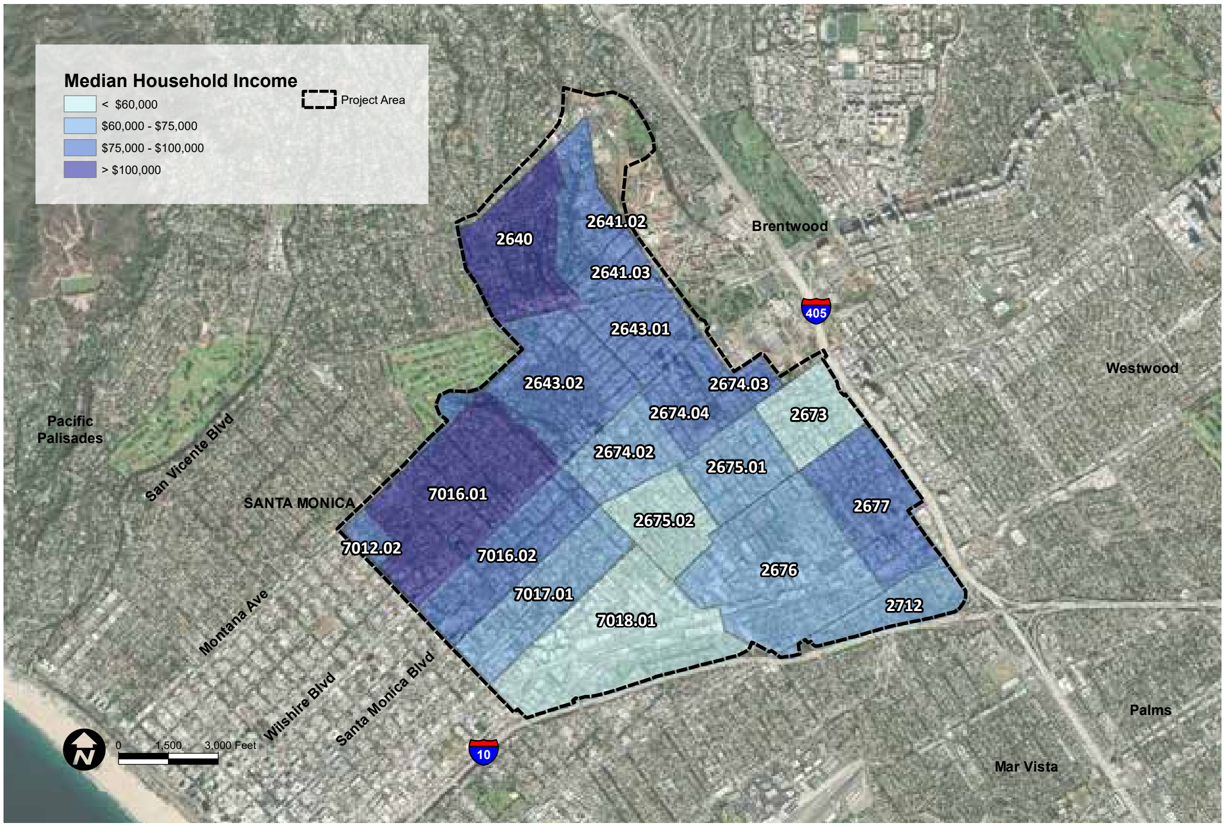
STUDY AREA CENSUS TRACTS AND LOW-INCOME HOUSEHOLDS



Source: U.S. Census Bureau 2015 ACS, AECOM

Figure 4-28

PILOT PROGRAM AREA MEDIAN HOUSEHOLD INCOME BY CENSUS TRACT



Source: U.S. Census Bureau 2015 ACS, AECOM

income of $72,500, and where 47.1% of households are housing cost-burdened. The areas inside the Mobility Go Zone Program boundaries have a high percentage of low-income households below the poverty line. Additionally, other communities in West LA have a large portion of census tracts with at least 5% of household incomes less than $25,000. Central LA has the largest portion of low-income households.

While these income and home price figures show that the study area is generally affluent, the large income range indicates that wealth is not equally distributed throughout the study area. Across the study area at large, 17.8% of all households reported annual incomes below $25,000 in 2014, including four census tracts where the proportion exceeded 23%. The total area-wide figure is lower than the citywide average of 26.7%, and would be lower if not for a notable concentration of householders under the age of 25 and the large student population serving Santa Monica College, University of California Los Angeles (UCLA), University of Southern California (USC), and other nearby educational institutions.

Within the study area, 5.5% of householders are under the age of 25, compared to 4% citywide and 3.1% countywide. Of the 1,890 householders under 25, 38.7% (or 732 households) reported household incomes below $25,000 in 2014. In contrast, only 12.2% of householders between the ages of 25 and 44 reported annual income under $25,000 within the study area. Therefore, if householders under the age of 25 are excluded from the area-wide sample, the number of households with income less than $25,000 is nearly halved to 17% of the study area population under this threshold.

Low-income households are distributed fairly evenly among racial and ethnic subgroups, as shown in Figure 4-29. Only 14.5% of Asian households were low-income in 2014, as compared with 17.4% of white-only households, and 21.1% of Hispanic households. Among other groups the low-income rate was 23.6%, including African Americans (2.9%) and multiracial households (two or more races), who comprise 3.7% of the study area's total low-income households. These low-income households are comparatively unlikely to have access to private vehicles. Lack of access to a vehicle may further depress economic prospects for low-income households and may increase the reliance on public transportation and other modes of travel.

Zero-Vehicle Households

It is difficult to obtain precise car sufficiency statistics using data from the U.S. Census Bureau or other publicly available sources because individual levels of income are not available; however, reasonable estimates of zero-vehicle household figures can be derived using the Bureau of Transportation Statistics' (BTS) 2001 National Household Travel Survey. The survey observed characteristics of zero-vehicle households with incomes less than $25,000. This conversion factor standard was used as a threshold for analyzing travel behavior for low-income household status within the Mobility

Table 4-24

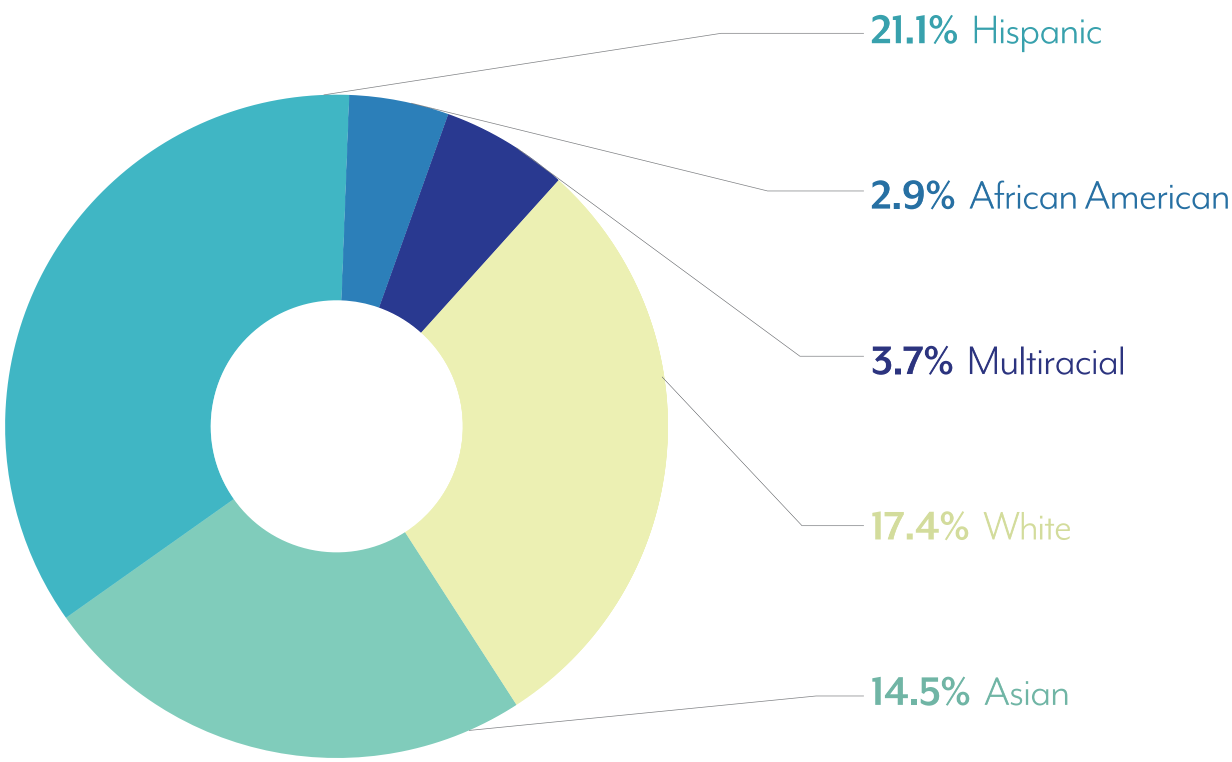
HOUSEHOLDS IN PILOT PROGRAM AREA WITH INCOME UNDER $25,000

CENSUS TRACT	MEDIAN INCOME	TOTAL HOUSEHOLDS	HOUSEHOLDS UNDER $25,000	% HOUSEHOLDS UNDER $25,000
Tract 2640	$204,432	1,209	79	6.5%
Tract 2641.02	$93,500	1,516	194	12.8%
Tract 2641.03	$78,472	1,455	268	18.4%
Tract 2643.01	$84,122	2,951	487	16.5%
Tract 2643.02	$95,284	2,919	356	12.2%
Tract 2673	$51,677	2,104	534	25.4%
Tract 2674.02	$64,624	2,591	497	19.2%
Tract 2674.03	$75,254	1,762	485	27.5%
Tract 2674.04	$79,286	1,592	373	23.4%
Tract 2675.01	$66,185	2,559	330	12.9%
Tract 2675.02	$57,105	1,616	225	13.9%
Tract 2676	$72,500	1,226	215	17.5%
Tract 2677	$81,029	1,712	318	18.6%
Tract 2712	$64,297	1,185	204	17.2%
Tract 7016.01	$104,280	1,909	258	13.5%
Tract 7016.02	$94,779	2,018	266	13.2%
Tract 7017.01	$71,217	1,665	290	17.4%
Tract 7018.01	$48,438	2,603	763	29.3%
TOTAL		**34,592**	**6,142**	**17.8%**

Source: U.S. Census Bureau 2015 ACS

Figure 4-29

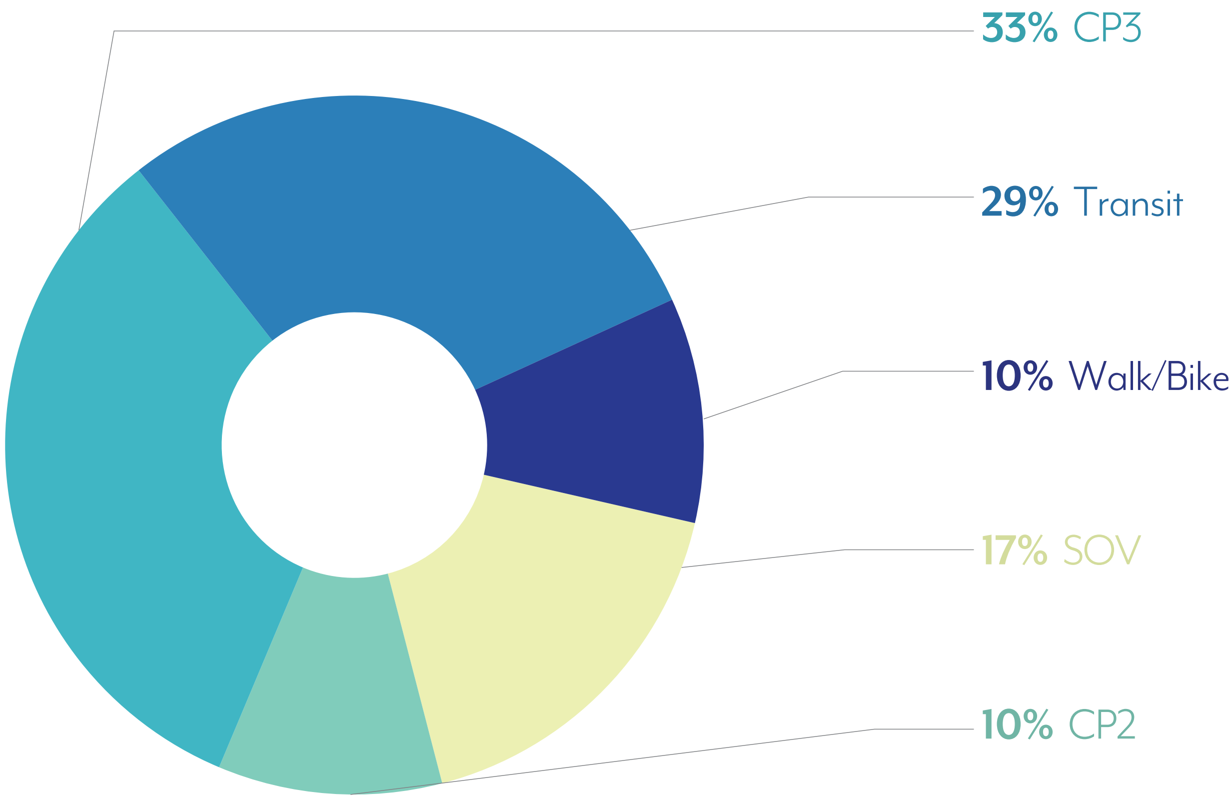
PERCENTAGE OF LOW-INCOME HOUSEHOLDS BY RACIAL/ETHNIC GROUPS



Source: U.S. Census Bureau 2015 ACS

Figure 4-30

PEAK HOUR MODE SHARE FOR INBOUND LOW-INCOME TRIPS



Source: 2012 SCAG RTP Travel Demand Model

Go Zone Program area because it matches the SCAG RTP definition of low-income populations.

The raw decline in the number of zero-vehicle households nationally since 2000 indicates that demographic characteristics of zero-car householders are unlikely to have changed significantly. Overall, 8.2% of households in the study area do not have access to a private vehicle, including 3.0% of owner-occupied households and 10.0% of renter-occupied households. If Census Tract 7018.01, which is horizontally bisected by the Metro Expo Line, is excluded from the sample, the zero-vehicle household rate declines to 7.4%. Using the BTS standard, which assumes that a low-income household is 8.8 times less likely to own a car than a household with an income exceeding $25,000, it is fair to estimate that there are approximately 2,500 low-income zero-vehicle households in the entire study area.

Though student and retiree households likely comprise a significant portion of these zero-vehicle households, it should be noted that nearly 1,200 householders between the ages of 35 and 64 do not have access to a vehicle. Using the same BTS metric, there are about 1,050 low-income householders of this prime working age who do not own or have access to a private car and rely on public transit. This represents about 3% of total study area households.

Investments in the public transportation network, funded by revenue-generating decongestion fees would especially benefit these workers, and more generally, the roughly 8% of total workers who commute via public transit. They would also be a boon to zero-vehicle households. As transit options become more attractive, these groups could both grow in number, as both transit commuting and discretionary vehicle-free lifestyles become more attractive.

Low-Income Travel Patterns and Demand

It is important to understand travel patterns for those low-income travelers who not only reside in the study area but also those who travel to the study area from other parts of LA County. These patterns serve to inform how public transportation investments should be directed and what policies should be considered in the design of the Mobility Go Zone Program.

Low-income travel patterns were defined using the SCAG RTP Travel Demand Model for categorizations of person trips. The SCAG model estimates trips for five household market segments, which are carried from trip generation through trip distribution and mode choice. This model was used for the equity analysis that focuses on the category of car sufficient households with incomes less than $25,000. For forecasted travel demand, opening year is 2020 with a horizon year of 2035. Trips are separated by mode and purpose to best understand how different travelers utilize various modes for different trip purposes and best design policies to mitigate impacts to low-income travelers. Mode choices include automobile, transit, or other (i.e., walking, biking). Trip purpose is work or non-work based trips.

Mode choice of low-income trips are discussed and separated by vehicle occupancy (SOV, CP2, and CP3), transit, and active transportation. Next, the shares of trips by low-income travelers by originating district are discussed to describe where people are coming from to access the study area. Lastly, the future transit boardings on the proposed routes are shown. This information can assist in identifying transit alternatives that would be funded by the program revenues to better serve transit dependent populations.

Mode Choice

The mode share of low-income travelers during the peak inbound trips, during which the program would take effect, is shown in Figure 4-30. Only 17% of low-income travelers drive alone to the area during peak periods as low-income travelers rely heavily on transit (29%) and carpooling (43%) as primary modes of travel to access the study area during peak periods. This analysis suggests that identifying improved carpooling and transit related components could serve to increasingly benefit low-income travelers.

The share of low-income travelers by trip type is included in Table 4-25 and is important to analyze as it compares information on both mode choice and trip purpose entering the study area. Work trips are more routine than non-work trips and therefore easier to switch to transit or another mode if currently taken via automobile. Additionally, work trips typically have a higher value of time associated with them as employees need to arrive to work on time. Providing high quality and reliable transit options for the transit dependent population is key to a successful Mobility Go Zone Program.

As the table shows, only 8% of all daily travel trips taken are by low-income individuals, but when looking at transit trips only, low-income travelers account for 23.6% of all daily transit trips taken. This increases to approximately 30% when only looking at work transit trips, further showing low-income commuters reliance on transit. Of the number of people using single occupancy vehicles, only 2.2% are low-income, which means (98%) of single occupancy vehicles traveling to the study area are not low-income travelers.

Trip Origins (2020)

A majority of trips for both low-income and all-incomes traveling to the study area are traveling from the West Los Angeles district and also originate within the study area. The percentage of intra-zone (i.e., originating and ending within the area) low-income trips is 32%, and the percentage of low-income trips originating in West LA is 38%. This shows 60% of low-income trips originate within the study area or in West LA. Figure 4-31 displays the projected trip distribution for low-income travelers to the study area in the assumed opening year of 2020. These findings suggest that over half of all low-income trips travel shorter distances. Other trip origin centers that make up a share of low-income trips are

Table 4-25

PERCENTAGE OF LOW-INCOME TRIPS TO THE STUDY AREA BY TRIP TYPE

TRIP TYPE	INCOME TYPE	PERSON TRIPS	% LOW-INCOME
Total Person Trips	Low-income	25,046	8.0%
	All Income	313,292	
Total Auto Trips	Low-income	15,958	6.3%
	All Income	251,504	
Total Transit Trips	Low-income	4,734	23.6%
	All Income	20,025	
Work Person Trips	Low-income	5,769	5.8%
	All Income	99,386	
Work Auto Trips	Low-income	1,770	2.2%
	All Income	82,321	
Work Transit Trips	Low-income	3,745	29.7%
	All Income	12,597	
Non-Work Person Trips	Low-income	19,276	9.0%
	All Income	213,906	
Non-Work Auto Trips	Low-income	14,188	8.4%
	All Income	169,183	
Non-Work Transit Trips	Low-income	988	13.3%
	All Income	7,429	

Source: 2012 SCAG RTP Travel Demand Model

Note: Person trips are trips taken by a single individual on any mode of transportation. Auto trips are those trips taken in automobile. Transit trips are those trips taken on public transit. Work trips are those trips taken to or from work. Non-work trips are all trips not qualifying as work trips. Total trips include work and non-work trips. Total person trips also include walking and biking trips.

Central LA (10%), San Fernando Valley (5%), South Bay (4%) and Gateway Cities (3%).

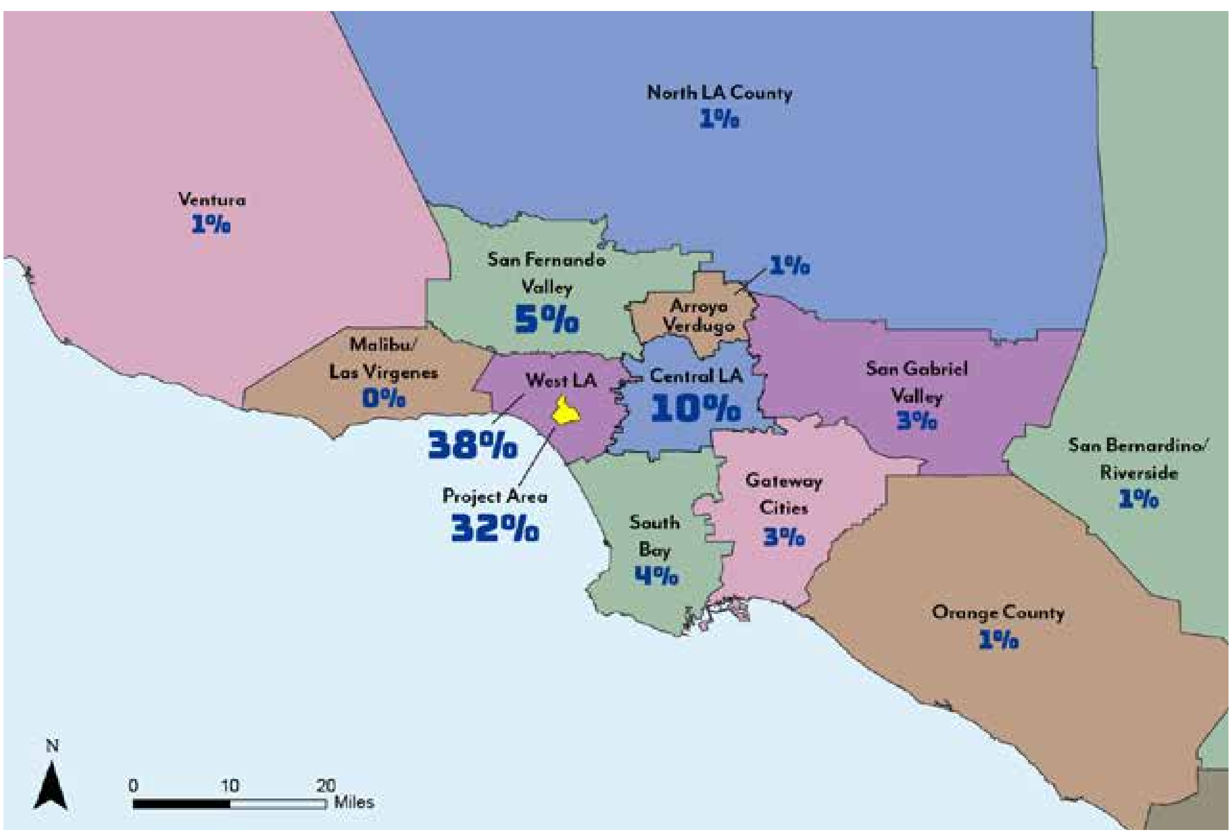
Table 4-26 shows the number of trips and relative percentage of both low-income and all-income inbound trips to the study area by originating districts immediately after assumed program implementation in 2020. Note that the percentage of total trips for both low-income populations and all-incomes are very similar, with approximately 30% of intra-zone trips and 38% originating in West LA. Low-income trips from Central LA show a transit dependency for east-west travel as low-income travelers account for 23% of transit trips, but only 8% of auto trips from Central LA. From the north and south, the two largest districts that generate trips are the San Fernando Valley and South Bay but these trips are heavily dominated by auto trips due to the limited transit options currently available.

Trip Origins (2035)
Table 4-27 shows the number of projected trips and relative percentages in 2035 of low-income and all-income inbound trips to the study area by districts. Similar to the 2020 results, majority of 2035 trips (both low-income and all-income) to the study area are from the West Los Angeles district and the study area itself. The percent change for trips traveling from the intra-zone area and West Los Angeles between 2020 and 2035 is minimal. Total low-income inbound trips for the intra-zone area increase by 2%, and for all-income trips, the percentage of trips traveling to the study area increase a minimum of 1%. These findings may serve to better inform policies and investment in commuter buses based off the travel patterns and the origin of low-income trips to the study area.

Transit Boardings
Figure 3-12 in the previous chapter shows the proposed transit enhancements identified as part of the pilot program. Table 4-28 and Table 4-29 below show the number of new transit boardings for low-income travelers and the percentage of new boardings on the proposed route options. Low-income transit boardings stay relatively constant between 2020

Figure 4-31

PERCENTAGE OF LOW-INCOME TRIPS BY ORIGINATING DISTRICT



Source: 2012 SCAG RTP Travel Demand Model, AECOM and 2035, but the relative percent of low-income transit riders to overall ridership decreases with an increase in overall ridership.

REVIEW OF EXISTING LOW-INCOME DISCOUNT PROGRAMS

A review of materials on existing international cordon pricing programs did not identify discounts for low-income users, although some cities, such as London, have exemptions for disabled drivers and residents but both were not tied to income. A review of express and toll lanes in the United States identified very limited description of programs offering discounts for low-income users. Based on this review, it appears that the LA Metro ExpressLanes program, which offers discounts based on income, serves as the best point of comparison to evaluate road pricing equity programs.

Discount programs offer different program designs for the participation of low-income users. The enrollment structure and benefits of such programs are useful to evaluate in considering what the appropriate design of a discount program for the project would look like. A program with an established structure, lower barriers for entry, and high benefits would be ideal for low-income travelers.

The Metro ExpressLanes Low-Income Assistance Program
Metro's program provides a $25 credit towards the transponder required to use the express lanes, and a waiver of the account maintenance fee (currently $1 per month). The discount is available to households making less than 200% of the federal poverty level, based on the size of their household (see Table 4-30 for 2017 income thresholds). A June 2014, Metro staff report stated that 2.1% of the I-10 and I-110 Metro ExpressLanes accounts were enrolled in the low-income discount program, however that percentage is continuing to rise. Between fiscal year 2015–2017, Metro has opened 14,200 accounts through the low-income assistance plan.

The City of Los Angeles Department of Water and Power (LADWP)

LADWP offers a "lifeline," or low-income discount program, with the same income eligibility requirements as the Metro ExpressLanes program. The total benefit for both electricity and water is approximately $25 per month, or $300 per year. As in the Metro program, documentation of income is required. According to data from LADWP, 522,000 of their 1.4 million customers (or 37.3%) are eligible for the program. Of those, only 220,000 (or 42%) of those eligible, enroll in the program, for an overall participation rate of 15.7% of eligible customers. The higher participation rate is likely due to the larger size of the benefits, plus the non-optional nature of water and electrical service.

Southern California Gas also offers a California Alternate Rates for Energy (CARE) Program
The CARE Program provides a $15 credit on service establishment and a 20% discount on monthly rates. Compared to the Metro and LADWP programs, enrollment is easier. Anyone who is receiving benefits from Medi-Cal, WIC, or SSI qualifies for the CARE program. In addition, customers can qualify by self-declaration of income. According to Southern California Gas, 81% of eligible customers participate in the CARE program. (Data on the percentage of customers who are eligible are not available.) The simpler qualification requirements appear to increase the participation rate substantially.

EQUITY POLICY SUGGESTIONS

The analysis presented here serves to identify the needs and travel patterns of low-income populations and presents policy considerations of program design to ensure the needs of low-income populations are addressed. Key findings from this analysis suggest the following:

- 8% of all daily trips are made by low-income individuals;
- Overall, 8.2% of households in the study area do not have access to a private vehicle, including 3.0% owner-occupied households and 10.0% of renter-occupied households;
- Over half of all low-income trips are short distance of approximately 7 miles within the West LA district and the study area itself;
- Low-income commuters rely heavily on transit for work purposes as only 2.2% of work trips by automobiles are by low-income commuters, compared with 30% or 3,745 of all transit work trips;
- Many low-income travelers already use high occupancy modes as only 17% of low-income travelers use single occupancy vehicles to access the study area during peak hours;
- Low-income travelers rely heavily on transit as 29% use public transit and 43% utilize carpooling as primary modes of travel to access the study area during peak periods

The study findings indicate that a discount program should be considered as part of any potential pilot program to address equity concerns. A discount program could be modeled after the Metro ExpressLanes Low-Income Assistance Plan, which allows for tiered participation by family size and income. One consideration is to provide eligible users a 50% reduction on the posted decongestion fee amount. Per the analysis of other Los Angeles low-income assistance programs above, the enrollment rate of eligible participants is expected to be very high. An alternative to the 50% discount fee could be decongestion fee credits, which would be applied after taking a set amount of one-way trips. For example, if a traveler takes 16 one-way trips entering the Mobility Go Zone, they will receive a credit amount that could be applied for future decongestion fees, or for the use of other public transportation options.

As the travel demand analysis suggests, a large number of low-income travelers are carpooling. Free entry to carpool vehicles with three or more passengers (CP3) is a policy

Table 4-26

LOW-INCOME VS ALL-INCOME INBOUND TRIPS (2020) TO MOBILITY GO ZONE PROGRAM AREA

DISTRICTS	NORTH LA COUNTY	VENTURA COUNTY	MALIBU/LAS VIRGENES	SAN FERNANDO VALLEY	ARROYO VERDUGO	SAN GABRIEL VALLEY	SAN BERNARDINO/ RIVERSIDE	ORANGE COUNTY	GATEWAY CITIES
Low-income									
Total Trips	199 (1%)	174 (1%)	94 (0%)	1,292 (5%)	143 (1%)	642 (3%)	245 (1%)	325 (1%)	642 (3%)
Auto Trips	161 (1%)	150 (1%)	84 (1%)	963 (6%)	91 (1%)	332 (2%)	166 (1%)	202 (1%)	349 (2%)
Transit Trips	37 (1%)	23 (0%)	10 (0%)	317 (7%)	51 (1%)	310 (7%)	79 (2%)	123 (3%)	291 (6%)
All-Income									
Total Trips	4,945 (2%)	4,388 (1%)	3,082 (1%)	24,431 (8%)	3,210 (1%)	8,116 (3%)	3,983 (1%)	4,806 (2%)	9,005 (3%)
Auto Trips	4,798 (2%)	4,298 (2%)	3,004 (1%)	22,991 (9%)	2,932 (1%)	7,279 (3%)	3,775 (2%)	4,489 (2%)	8,114 (3%)
Transit Trips	128 (1%)	89 (0%)	63 (0%)	1,286 (6%)	261 (1%)	817 (4%)	207 (1%)	316 (2%)	864 (4%)

Source: 2012 SCAG RTP Travel Demand Model, AECOM

Table 4-27

LOW-INCOME VS ALL-INCOME INBOUND TRIPS (2035) TO MOBILITY GO ZONE PROGRAM AREA

DISTRICTS	NORTH LA COUNTY	VENTURA COUNTY	MALIBU/LAS VIRGENES	SAN FERNANDO VALLEY	ARROYO VERDUGO	SAN GABRIEL VALLEY	SAN BERNARDINO/ RIVERSIDE	ORANGE COUNTY	GATEWAY CITIES
Low-income									
Total Trips	241 (1%)	165 (1%)	95 (0%)	1,190 (5%)	133 (1%)	693 (3%)	272 (1%)	382 (2%)	676 (3%)
Auto Trips	194 (1%)	140 (1%)	84 (1%)	884 (5%)	84 (1%)	336 (2%)	183 (1%)	197 (1%)	347 (2%)
Transit Trips	47 (1%)	25 (0%)	9 (0%)	295 (6%)	48 (1%)	356 (7%)	89 (2%)	185 (4%)	328 (7%)
All-Income									
Total Trips	5,909 (2%)	4,318 (1%)	3,215 (1%)	25,519 (7%)	3,330 (1%)	8,398 (2%)	4,259 (1%)	4,867 (1%)	9,197 (3%)
Auto Trips	5,705 (2%)	4,207 (2%)	3,118 (1%)	23,933 (9%)	3,028 (1%)	7,402 (3%)	4,010 (1%)	4,273 (2%)	8,145 (3%)
Transit Trips	179 (1%)	109 (0%)	78 (0%)	1,420 (6%)	284 (1%)	977 (4%)	249 (1%)	593 (2%)	1,027 (4%)

Source: 2012 SCAG RTP Travel Demand Model, AECOM

SOUTH BAY	INTRA-ZONE	WEST LOS ANGELES	CENTRAL LA	TOTAL
1,061 (4%)	8,118 (32%)	9,639 (38%)	2,472 (10%)	25,046
715 (4%)	4,936 (31%)	6,456 (40%)	1,352 (8%)	15,958
335 (7%)	730 (15%)	1,345 (28%)	1,082 (23%)	4,734
20,616 (7%)	83,114 (27%)	119,657 (38%)	23,906 (8%)	313,292
19,238 (8%)	55,025 (22%)	95,719 (38%)	19,810 (8%)	251,504
1,204 (6%)	4,282 (21%)	6,803 (34%)	3,705 (19%)	20,025

SOUTH BAY	INTRA-ZONE	WEST LOS ANGELES	CENTRAL LA	TOTAL
1,056 (4%)	8,448 (34%)	9,366 (37%)	2,384 (9%)	25,103
694 (4%)	5,125 (33%)	6,146 (39%)	1,280 (8%)	15,697
350 (7%)	730 (15%)	1,449 (29%)	1,067 (21%)	4,979
21,603 (6%)	94,766 (28%)	131,001 (38%)	26,393 (8%)	342,809
19,998 (7%)	62,082 (23%)	103,572 (38%)	21,593 (8%)	271,099
1,421 (6%)	4,953 (20%)	8,548 (35%)	4,374 (18%)	24,214

option. While this can provide benefits to travelers of all income-levels, travel demand results suggest that low-income users rely more heavily on carpooling. As shown above in Figure 4-30, one-third of inbound low-income travelers utilize CP3s. This helps promote the goals of the program by having people use higher occupancy modes to access the pilot study area.

Increased frequency on existing transit lines and the addition of new proposed transit routes are included as part of the proposed program. As shown in Table 4 above, nearly 24% of inbound transit trips are by low-income travelers with this percentage increasing to 30% for work-based trips. The proposed transit improvements would directly benefit these travelers by not only providing long-range access to the study area from areas currently underserved by transit, but the circulator routes would make transit more attractive and convenient to travel within and to the surrounding areas without a personal vehicle. The distribution of trips to the study area indicates a large number of trips originate within or nearby the area. Improved transit and circulator routes would serve to promote mobility options within the program area and distribute transit trips among multiple modes. Additionally, the project could establish partnerships with bike share providers and transit agencies (i.e., Metro, Big Blue Bus, and Metrolink), to provide free rides/credits on transit to increase customer awareness of available transit alternatives.

Other general policies include promoting bike share and other shared forms of transportation to increase alternative transportation use which would further expand mechanisms in which people can receive credits or discounts (e.g., providing Metro TAP credits once a low-income traveler has paid a certain amount of decongestion fees). The details of the program can be refined to mitigate the effects on low-income travelers.

Lastly, enrollment into a discount program should be carefully considered to ensure that the effort to enroll by those who qualify is equal to and/or relative to the benefit received. A discount program should not be onerous to enroll in with limited benefit. Additional study on the program design and enrollment process should be conducted prior to the implementation of a pilot program.

Table 4-28

DAILY TRANSIT BOARDINGS FROM NEW ROUTES (2020)

ROUTE	2020 LOW-INCOME	2020 ALL-INCOME	PERCENT LOW-INCOME
Circulator 1 (Santa Monica/Olympic)	2,340	8,910	26%
Circulator 2 (Wilshire/Montana)	740	3,680	20%
Encino Express Commuter Bus	290	1,340	22%
Long Beach Express Commuter Bus	700	2,950	24%
Total	**4,070**	**16,880**	**24%**

Source: 2012 SCAG RTP Travel Demand Model, AECOM

Table 4-29

DAILY TRANSIT BOARDINGS FROM NEW ROUTES (2035)

ROUTE	2035 LOW-INCOME	2035 ALL-INCOME	PERCENT LOW-INCOME
Circulator 1 (Santa Monica/Olympic)	1,720	7,740	22%
Circulator 2 (Wilshire/Montana)	1,480	7,070	21%
Encino Express Commuter Bus	150	960	15%
Long Beach Express Commuter Bus	600	2,850	21%
Total	**3,950**	**18,620**	**21%**

Source: 2012 SCAG RTP Travel Demand Model, AECOM

Table 4-30

METRO EXPRESSLANES LOW-INCOME ASSISTANCE PLAN ELIGIBILITY

HOUSEHOLD SIZE	INCOME THRESHOLD
1	$24,120
2	$32,480
3	$40,840
4	$49,200
5	$57,560
6	$65,920
7	$74,280
8	$82,640
For each additional person, add	$8,360

Source: LA Metro

5.0

FINANCIAL ANALYSIS

Table 5-1

COLLECTION INFRASTRUCTURE CAPITAL COST SUMMARY

ASSET	QUANTITY	UNIT COST (MILLIONS OF 2014$)	**Total (millions of 2014$)**
Type 1, Needs more Infrastructure	23	$0.22	**$5.15**
Type 1, Ready	3	$0.12	**$0.58**
Type 2, Needs more Infrastructure	13	$0.35	**$4.52**
Type 2, Ready	8	$0.32	**$2.53**
Field Deployment Subtotal	**47**		**$12.77**
Central Office Hardware/Software	1	$0.25	**$0.25**
Total			**$13.02**

Table 5-2

CAPITAL COST PROJECTIONS (MILLIONS OF YOE DOLLARS)

COST CATEGORY	2019	2020 - 2030	2031	2032 - 2035	**Total**
Collection Infrastructure	$14.7	$0.0	$0.0	$0.0	**$14.7**
Transit	$27.2	$0.0	$36.5	$0.0	**$63.7**
Total	**$41.9m**	**$0.0**	**$36.5**	**$0.0**	**$78.4**

This section summarizes the financial analysis results of the Mobility Go Zone Program. All capital and operating costs and operating revenues related to the pilot program and additional transit services are addressed. Operating balances and net cash flow for the project are projected in the assumed opening year (2020) and forecast year (2035). In addition to the primary project scenario, the financial analysis also includes an examination of the top-level cash flow financial impacts of a policy that exempts carpool vehicles with three or more passengers from the decongestion fee.

5.1 CAPITAL COSTS

Capital costs in this analysis include the costs related to procurement and installation of decongestion fee collection equipment along the perimeter of the Mobility Go Zone Program area as well as costs related to the procurement of the new bus fleet. Initial capital costs were assumed in 2019, one year prior to the anticipated opening year.

COLLECTION EQUIPMENT CAPITAL COSTS

The cost estimate assumes that 47 individual fee collection installations would be required along the perimeter of the Mobility Go Zone to collect the decongestion fee. In addition, hardware and software purchases at the central office would be required, as defined previously in the concept of operations. These capital cost projections are summarized in Table 5-1. These costs are assumed to be incurred in 2019 and there is no further anticipated capital reinvestment required in the collection equipment through the end of the analysis period. Each of the pilot program entry points was identified as a Type 1 or a Type 2 entrance (based on traffic volumes, as defined in Section 4.3) and evaluated for implementation readiness based on the presence of existing communications and equipment, as defined earlier in Section 4.3. An entry point is considered “Ready” for implementation if the location has ITS equipment and network connectivity that can be leveraged to house equipment and serve as a communications connection. An entry point is considered “Needs More Infrastructure” if there is no or limited ITS infrastructure available for connection.

TRANSIT CAPITAL COSTS

The transit level of service assumptions in the travel demand modeling were used to project the number of buses required for the new transit operations. Peak vehicles for each route were calculated by dividing the peak period runtimes by the peak period headways and rounding up. According to the National Transit Database (NTD), Santa Monica Big Blue Bus operated with a 26% spare ratio in 2013. Applying this spare ratio to the peak vehicle requirements sums to the total number of vehicles required for the new service. In both 2020 and 2035, a total of 48 new buses would be needed (38 for peak periods and 10 for spare vehicles).

All routes included in the new service were assumed to require 40-foot buses as peak load factors, determined to be moderate through the travel demand modeling. Based on previous Santa Monica Big Blue Bus experience, the loaded capital cost for a 40-foot bus is $500,000 (2014 $). The anticipated useful life of these buses is 12 years, so all buses procured prior to the first year of the analysis (2019) would need to be replaced in 2031. As 48 new buses are expected to be procured during each of the two rounds of vehicle purchases, a cost of $24 million (2014 $) would be incurred in 2019 and again in 2031.

TOTAL CAPITAL COSTS

All fee collection infrastructure and transit capital costs were converted from 2014 dollars to year of expenditure (YOE) dollars in this analysis using an inflation rate of 2.5%. Collection infrastructure capital costs were inflated from $13.0 million in 2014 dollars to $14.7 million in 2019 dollars. Transit capital costs were inflated from $24.0 million in 2014 dollars to $27.2 million in 2019 dollars and $36.5 million in 2031 dollars. Table 5-2 summarizes the projected capital outlays required over the analysis period (2019 through 2035).

5.2 OPERATING AND MAINTENANCE COSTS

Operating and maintenance (O&M) costs include the cost of maintaining the collection equipment along the perimeter of the Mobility Go Zone Program area, the cost of collecting the decongestion fee revenue, and the cost of operating and maintaining the new bus fleet. It is assumed that O&M costs would be expended from 2020 through 2035.

COLLECTION EQUIPMENT O&M COSTS

Operating costs related to decongestion fee collection and maintenance of collection equipment include:

- Maintenance to the hardware and software of the 47 collection installations
- Utility costs for the 47 collection machines
- Software maintenance at the central office
- Costs of communication between the collection machines (36 zero readiness machines only) and the central office

The collection infrastructure annual operating cost projections are summarized in Table 5-3. Fee collection costs include costs related to vehicle detection, classification processing, account management, customer service, violations processing, and marketing. The cost per transaction depends on the fee type paid by the driver. Table 5-4 summarizes the collection costs per transaction for the various payment types. It is assumed that the costs per transaction would change steadily over the analysis period.

It was assumed that drivers would adopt transponders to save money over the analysis period with a more rapid rate in the first three years and slower thereafter. The rate of adoption is anticipated to be steady between 2020 and 2023 and between 2023 and 2035. Table 5-5 summarizes the average collection costs for full and discounted decongestion fees in 2020, 2023, and 2035.

Annual fee collection costs were calculated by applying the traffic volumes projected by the demand modeling teams to the average costs per transaction. The fee collection costs in 2020, 2023, and 2035 are summarized in Table 5-6. It is assumed that transaction costs would increase with inflation.

TRANSIT O&M COSTS

Transit operating costs were projected using level of service assumptions and data from the NTD. In 2014, Santa Monica Big Blue Bus had an operating cost of $133.87 per hour (2014$). This rate was applied to the projected annual revenue hours for the various routes being considered. For local routes, an annualization factor of 300 was applied; for express routes, an annualization factor of 255 was applied. The annual transit operating costs projected in 2020 and 2035 are summarized in Table 5-7 and Table 5-8, respectively. It is assumed that operating cost per hour would increase with inflation.

TOTAL OPERATING COSTS

Table 5-9 summarizes the O&M cost projected over the entire analysis period.

Table 5-3

ANNUAL MAINTENANCE OF FEE COLLECTION INFRASTRUCTURE

MAINTENANCE COSTS	NUMBER OF LOCATIONS	AVERAGE ANNUAL COST PER LOCATION	Total
Machine Hardware/ Software	47	$10,250	**$481,750**
Machine Utilities	47	$600	**$28,200**
Central Office Software	1	$25,000	**$25,000**
Communications	36	$1,200	**$43,200**
Field Deployment Subtotal			**$578,150**

Table 5-4

AVERAGE FEE COLLECTION COST BY PAYMENT TYPE (2014$)

PAYMENT TYPE	2020	2035
Account holder without a transponder	$1.00	$0.75
Account holder with a transponder	$0.50	$0.25
Non-account holder (requires mailing out invoice/violation)	$1.50	$1.50

Table 5-5

AVERAGE COLLECTION COSTS (2014$)

FEE TYPE	2020	2023	2035
Full Pay Fee	$1.20	$0.83	$0.58
Discount Fee	$0.50	$0.45	$0.25

Table 5-6

ANNUAL COLLECTION COSTS (2020, 2023, AND 2035)

TYPE OF TRANSACTION	NUMBER OF TRANSACTIONS (MILLIONS)	COST PER TRANSACTIONS (YOE$)	TOTAL (MILLIONS OF YOE$)
Full Pay Fee Transaction (2020)	17.10	$1.39	$23.79
Discount Fee Transaction (2020)	5.58	$0.58	$3.23
2020 Total	**22.67**		**$27.03**
Full Pay Fee Transaction (2023)	17.35	$1.04	$18.09
Discount Fee Transaction (2023)	5.67	$0.56	$3.16
2023 Total	**23.02**		**$21.25**
Full Pay Fee Transaction (2035)	18.40	$0.94	$17.34
Discount Fee Transaction (2035)	6.16	$0.40	$2.41
2035 Total	**24.45**		**$19.75**

Table 5-9

O&M COST PROJECTIONS (MILLIONS OF YOE DOLLARS)

COST CATEGORY	2020	2021	2022	2023	2024	2025	2026
Collection Equipment	0.7	0.7	0.7	0.7	0.7	0.8	0.8
Fee Collection	27.0	24.9	23.0	21.2	21.1	21.0	20.9
Transit	15.8	16.2	16.6	17.0	17.4	17.9	18.3
Total	**$43.5**	**$41.8**	**$40.3**	**$39.0**	**$39.3**	**$39.6**	**$40.0**

Table 5-7

TRANSIT O&M COST (2020)

ROUTE	ANNUAL REVENUE HOURS	COST PER HOUR (2020$)	ANNUAL COST (MILLIONS OF 2020$)
Circulator 1	25,088	$155.25	$3.89
Circulator 2	45,478	$155.25	$7.06
Express Commuter (Long Beach)	17,487	$155.25	$2.71
Express Commuter (Encino)	13,435	$155.25	$2.09
Total	**101,487**	**$155.25**	**$15.76**

Table 5-8

TRANSIT O&M COST (2035)

ROUTE	ANNUAL REVENUE HOURS	COST PER HOUR (2035$)	ANNUAL COST (MILLIONS OF 2035$)
Circulator 1	25,260	$224.85	$5.68
Circulator 2	45,710	$224.85	$10.28
Express Commuter (Long Beach)	17,889	$224.85	$4.02
Express Commuter (Encino)	13,616	$224.85	$3.06
Total	**102,474**	**$224.85**	**$23.04**

2027	2028	2029	2030	2031	2032	2033	2034	2035	**Total**
0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	**$13.0**
20.7	20.6	20.5	20.3	20.2	20.1	20.0	19.9	19.7	**$341.2**
18.8	19.3	19.8	20.3	20.8	21.4	21.9	22.5	23.0	**$306.9**
$40.3	**$40.7**	**$41.1**	**$41.5**	**$41.9**	**$42.4**	**$42.8**	**$43.3**	**$43.8**	**$661.1**

5.3 OPERATING REVENUES

Operating revenues in this analysis include revenues from the decongestion fee and bus fare revenue.

DECONGESTION FEE OPERATING REVENUES

Table 5-10 summarizes the fee collection assumptions used in the financial analysis for non-residents, low-income travelers, residents, and trucks in 2020 and 2035 to determine the effective average decongestion fee used for financial modeling purposes, when incorporating anticipated discounts for residents and low-income travelers. The projected revenues from the decongestion fees collected are summarized in Table 5-11. It is assumed that rates increase with inflation.

TRANSIT OPERATING REVENUES

Transit fare revenue was projected by applying projected new ridership to fare paid per passenger from the NTD. In 2014, Santa Monica Big Blue Bus had an average fare per passenger of $0.74 (2014 $). This fare was applied to the projected annual boardings for the various routes being considered with applicable annualization factors for local and express routes. The annual transit fare revenue projected in 2020 and 2035 are summarized in Table 5-12 and Table 5-13, respectively. It is assumed that ridership will increase steadily and that average fares will increase with inflation.

TOTAL OPERATING REVENUES

Table 5-14 summarizes the operating revenue projections over the analysis period.

Table 5-10

EFFECTIVE AVERAGE DECONGESTION FEE CALCULATION (2020)

VEHICLE CATEGORY	VEHICLE	PROJECTED DAILY TRAFFIC VOLUME (2020)	PROJECTED DAILY TRAFFIC VOLUME (2035)	DECONGESTION FEE ASSESSED (2014$)
	Drive Alone	45,237	47,576	$4.00
Non-resident	Carpool 2	9,166	10,255	$4.00
	Carpool 3	11,337	12,796	$4.00
	Drive Alone	6,760	7,109	$2.00
Low-income	Carpool 2	1,370	1,532	$2.00
	Carpool 3	1,694	1,912	$2.00
	Drive Alone	9,451	10,324	$0.40
Residents	Carpool 2	1,483	1,633	$0.40
	Carpool 3	1,121	1,241	$0.40
Truck	Truck	1,303	1,510	$4.00
Effective Average Fee				**$3.29**

Table 5-11

DECONGESTION FEE REVENUE PROJECTIONS

YEAR	NUMBER OF TRANSACTIONS (MILLIONS)	AVERAGE FEE (YOE$)	**Total (millions of YOE$)**
2020	22.67	$3.82	**$86.54**
2035	24.45	$5.53	**$135.16**

Table 5-12

FARE REVENUE PROJECTIONS (2020)

ROUTE	ANNUAL NEW BOARDINGS	AVERAGE FARE (2020$)	ANNUAL FARE REVENUE (MILLIONS OF 2020$)
Proposed New Transit Routes (Circulators and Express Commuter)	674,550	$0.84	$0.567
Existing Routes	471,300	$0.84	$0.396
Total	**1,145,850**	**$0.84**	**$0.963**

Table 5-13

FARE REVENUE PROJECTIONS (2035)

ROUTE	ANNUAL NEW BOARDINGS	AVERAGE FARE (2035$)	ANNUAL FARE REVENUE (MILLIONS OF 2035$)
Proposed New Transit Routes (Circulators and Express Commuter)	1,520,985	$1.22	$1.856
Existing Routes	161,400	$1.22	$0.200
Total	**1,682,385**	**$1.22**	**$2.050**

5.4 NET LOCAL CASH FLOW SUMMARY

Net local cash flow is calculated by adding the local share of the collection infrastructure and transit capital costs to the operating balance. This analysis assumes a local match totaling 20% of all capital costs ($8.4 million in 2019 and $7.3 million in 2031); the remaining 80% of capital costs is assumed to be covered by either state or federal grants ($33.5 million in 2019 and $29.1 million in 2031).

Table 5-15 summarizes the local expenditures, operating balance, and net local cash flow (in millions of YOE dollars). Between 2020 and 2035, the Mobility Go Zone Program is expected to generate an average of $68.8 million per year in net revenue given the size of the area analyzed and assumed rate structure.

Table 5-14

OPERATING REVENUE PROJECTIONS (MILLIONS OF YOE DOLLARS)

SOURCE	2020	2021	2022	2023	2024
Fee Revenue	86.5	89.1	91.8	94.6	97.4
Transit Revenue	1.0	1.0	1.1	1.1	1.2
Total	**$87.5**	**$90.2**	**$92.9**	**$95.7**	**$98.6**

Table 5-15

NET LOCAL CASH FLOW (MILLIONS OF YOE DOLLARS)

SOURCE	2019	2020	2021	2022	2023	2024
Local Match	(8.4)	--	--	--	--	--
Fee Collection O&M	--	(27.7)	(25.6)	(23.7)	(22.0)	(21.9)
Transit O&M	--	(15.8)	(16.2)	(16.6)	(17.0)	(17.4)
Fee Revenue	--	86.5	89.1	91.8	94.6	97.4
Transit Revenue	--	1.0	1.0	1.1	1.1	1.2
Total	**($8.4)**	**$44.1**	**$48.4**	**$52.6**	**$56.7**	**$59.3**

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
100.3	103.4	106.5	109.7	112.9	116.3	119.8	123.4	127.1	131.0	135.2	**$1,745.1**
1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	**$23.1**
$101.6	**$104.7**	**$107.8**	**$111.1**	**$114.5**	**$117.9**	**$121.5**	**$125.2**	**$129.0**	**$132.9**	**$137.3**	**$1,768.2**

2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
--	--	--	--	--	--	(7.3)	--	--	--	--	**($15.7)**
(21.7)	(21.6)	(21.5)	(21.4)	(21.3)	(21.2)	(21.1)	(21.0)	(20.9)	(20.8)	(20.7)	**($354.2)**
(17.9)	(18.3)	(18.8)	(19.3)	(19.8)	(20.3)	(20.8)	(21.4)	(21.9)	(22.5)	(23.0)	**($306.9)**
100.3	103.4	106.5	109.7	112.9	116.3	119.8	123.4	127.1	131.0	135.2	**$1,745.1**
1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	**$23.1**
$62.0	**$64.7**	**$67.5**	**$70.4**	**$73.4**	**$76.4**	**$72.3**	**$82.8**	**$86.2**	**$89.6**	**$93.6**	**$1091.4**

5.5 CP3 FREE SCENARIO

The financial analysis also considered a lower effective average decongestion fee that would result from a policy that exempts carpool vehicles with three or more passengers from the decongestion fee. This resulted in a different mix of vehicle types and slight changes in transit ridership to the travel demand model. This alternative is included in the financial analysis only to show the effect of providing a different discount policy and its effect on net revenue. Table 5-16 summarizes the decongestion fee assumptions of the CP3 Free Scenario. Because some vehicles no longer pay a decongestion fee, the effective average fee decreased in this alternative. It is assumed that traffic volumes change steadily over the analysis period. Additional traffic enforcement may be necessary under this scenario which would have some additional costs not quantified within this analysis.

The CP3 Free Scenario is projected to change the financial results of the primary alternative in the following ways:

Collection equipment capital costs: the boundary is unchanged in the CP3 Free Scenario; there will be no impact on the collection equipment capital costs presented in the Collection Equipment Capital Costs section.

Transit capital costs: the transit level of service is unchanged in the CP3 Free Scenario; there will be no impact on the transit capital costs presented in the Transit Capital Costs section.

Decongestion Fee O&M costs: annual capital maintenance costs related to program assets is unchanged in the CP3 Free Scenario; changes in traffic volumes results in decreases in the fee collection costs presented in the Collection Equipment O&M Costs section.

Bus O&M costs: the transit level of service is unchanged in the CP3 Free Scenario; there will be no impact on the transit O&M costs presented in the Transit O&M Costs section.

Fee revenue: changes in traffic volumes and effective average decongestion fee results in decreases in the fee revenue presented in the Decongestion Fee Operating Revenues section.

Bus revenue: minor changes in transit ridership in the CP3 Free Scenario results in decreases to the revenue presented in the Transit Operating Revenues section.

Table 5-17 summarizes the net local cash flow for the CP3 Free Scenario. Between 2020 and 2035, the CP3 Free Scenario is expected to generate an average of $48.4 million per year in net revenue.

Table 5-17

NET LOCAL CASH FLOW (MILLIONS OF YOE DOLLARS)

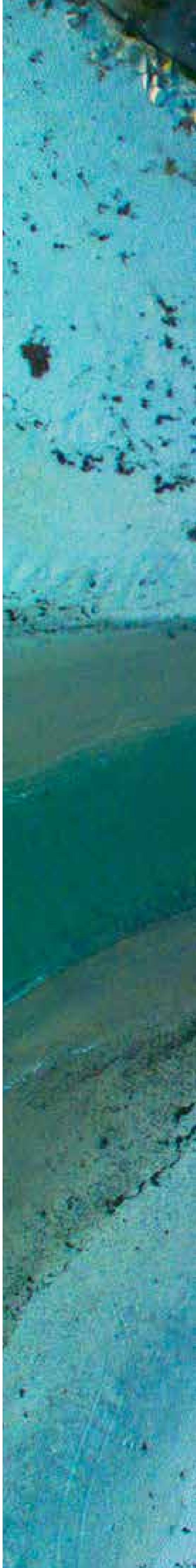
Source	2019	2020	2021	2022	2023	2024	2025
Local Match	(8.4)	--	--	--	--	--	--
Fee Collection O&M	--	(25.7)	(24.0)	(22.5)	(21.0)	(20.9)	(20.7)
Transit O&M	--	(15.8)	(16.2)	(16.6)	(17.0)	(17.4)	(17.9)
Fee Revenue	--	69.7	71.7	73.8	76.0	78.3	80.5
Transit Revenue	--	1.0	1.0	1.1	1.1	1.2	1.2
Total	**($8.4)**	**$29.2**	**$32.6**	**$35.9**	**$39.1**	**$41.1**	**$43.2**

Table 5-16

EFFECTIVE AVERAGE FEE CALCULATION, CP3 FREE SCENARIO

VEHICLE CATEGORY	VEHICLE	PROJECTED DAILY TRAFFIC VOLUME (2020)	PROJECTED DAILY TRAFFIC VOLUME (2035)	DECONGESTION FEE ASSESSED (2014$)
	Drive Alone	43,749	46,070	$4.00
Non-resident	Carpool 2	8,835	9,863	$4.00
	Carpool 3	17,478	19,215	--
	Drive Alone	6,537	6,884	$2.00
Low-income	Carpool 2	1,320	1,474	$2.00
	Carpool 3	2,612	2,871	--
	Drive Alone	9,561	10,220	$0.40
Residents	Carpool 2	1,470	1,616	$0.40
	Carpool 3	1,259	1,395	--
Truck	Truck	1,303	1,510	$4.00
Effective Average Fee				**$2.50**

2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	**Total**
--	--	--	--	--	(7.3)	--	--	--	--	**($15.7)**
(20.5)	(20.4)	(20.2)	(20.1)	(19.9)	(19.8)	(19.6)	(19.5)	(19.3)	(19.2)	**($333.5)**
(18.3)	(18.8)	(19.3)	(19.8)	(20.3)	(20.8)	(21.4)	(21.9)	(22.5)	(23.0)	**($306.9)**
82.9	85.4	87.9	90.4	93.1	95.8	98.6	101.5	104.5	108.4	**$1,398.7**
1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.8	1.9	2.0	**$22.9**
$45.3	**$47.5**	**$49.8**	**$52.1**	**$54.5**	**$49.6**	**$59.4**	**$62.0**	**$64.6**	**$68.2**	**$765.5**



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