Member, Board of Supervisors
District 7

City and County of San Francisco

NORMAN YEE

DATE: December 31, 2017

TO: Commissioners, San Francisco County Transportation Authority Board

RE: Balboa Area Transportation Demand Management Framework

Background

Since the adoption of the 2009 Balboa Park Station Area Plan, the Balboa Area has been planning for change. The Balboa Reservoir development, other pending housing projects in the neighborhood, a new City College facilities master plan, and a growing City College student enrollment are all expected to increase the local population and traffic density in the area. While we continue to invest in more transit operations and improved pedestrian safety in the Balboa Park Station area, the neighborhood remains constrained by roadway capacity, topography, and the I-280 freeway. The traffic congestion is already challenging, especially during peak commute hours. There is a desperate need to better address current travel demand and to plan for the impending growth in the area, especially given the City's commitment to meeting its sustainability and Vision Zero goals.

As the community started to discuss concerns around parking, transit, and traffic congestion for the Balboa Reservoir development, it became clear that we required a more robust, comprehensive evaluation of existing conditions and future needs. It was also apparent that the Balboa Reservoir development could not proceed without a successful plan to address the loss of parking for City College. In late 2015, I requested funding through the County Transportation Authority to develop a study to help identify short-term and long-term solutions for the area. From this request, the Balboa Area Transportation Demand Management (TDM) Framework was proposed.

The Balboa Area TDM Framework document serves as a starting point in addressing these issues. It provides conceptual recommendations for effective transportation demand programs for the Balboa Reservoir, City College, and the surrounding neighborhoods. The intention is that this Framework provides a common foundation that informs future TDM Plans at the Balboa Reservoir and City College and any TDM programs in the area.

Lessons Learned

While the TDM Framework met the minimum goals identified in the project's scope of work, the process shed light on a number of issues that still need to be adequately addressed in future studies. Since these conversations will continue to evolve, I want to highlight some lessons learned.

One of the major discussion points was the assessment of the existing parking demands for City College and the surrounding areas. It was challenging to get stakeholders from the community to agree upon the optimal times to measure parking needs. At the time, Free City

Member, Board of Supervisors
District 7

City and County of San Francisco

NORMAN YEE

College had not been implemented yet. With enrollment increasing, parking needs will likely increase. There are also variables on any given day during the semester. Therefore, studies should take place on different days, times, and during "peaks" in the semester based on previous knowledge. By working closely with City College and gathering input from faculty, students, and neighbors, future evaluations should incorporate a more comprehensive account of conditions.

The issue of parking loss and increased demand is a complex one that will not be adequately addressed in one study. The TDM Framework offers suggestions on best practices to determine "right sized" parking and other ways to disincentive driving to and from the City College campus. However, the reality is that parking will always be necessary since the College serves working students and those with families. The surrounding neighborhoods also have a finite amount of parking, which will become further exacerbated when the Balboa Reservoir project is built. The solutions suggested, such as the implementation of the Residential Parking Permit program, will need to be further evaluated, as there may be unintended consequences of overburdening the neighborhood with a laborious application process, while also making it increasingly difficult for working students to access the campus. Future studies will need to find a way to balance all of these needs outside the traditional TDM framework.

After several rounds of community input and revisions, the development of the TDM Framework included discussions that led to a greater understanding of community concerns related to traffic, safety, transit, and data collection. Future studies will require a similar iterative process and one of the lessons learned is to establish a collective understanding of the goals of a study, the limitations, the timeline, and the decision-making process from the onset. The TDM Framework had to return to various public bodies multiple times for further public input after a final draft was completed. In the end, this provided several opportunities for a diverse set of opinions to be heard. Many of the points made by the public were incorporated in the version that will be ultimately approved by the Transportation Authority.

This public process can always be improved upon. As future housing developments progress, it is worth noting that we need to further define the functional roles of the two public bodies, the Balboa Station Area Community Advisory Committee and the Balboa Reservoir Community Advisory Committee, in how to create deeper public engagement as it pertains to transportation and land use planning.

Lastly, the TDM Framework provided an opportunity to reflect on how City departments, City College, and other entities can work more closely in coordination in short-term and long-term planning for the area. With City College's master plan in development and capital improvements identified, there needs to be a high-level strategy to ensure that we are being efficient with funding and attempting to collectively solve the various challenges with transit, walkability, and parking.

City Hall • 1 Dr. Carlton B. Goodlett Place , Room 244 • San Francisco, California 94102-4689 • (415) 554-6516
Fax (415) 554-6546 • TDD/TTY (415) 554-5227 • E-mail: Norman.Yee@sfgov.org

Member, Board of Supervisors
District 7

City and County of San Francisco

NORMAN YEE

Outcomes

The TDM Framework is a first step in planning TDM efforts for the Balboa Area. As the Reservoir developer and City College begin to draft implementable plans, community input will continue to play a significant role. Transportation and TDM will be discussed in ongoing public meetings for the City College Facilities Master Plan, Balboa Reservoir and other Community Advisory Committees. Only after further public engagement and exploration of TDM programs will the Reservoir developer and City College draft more detailed, implementable TDM plans. These plans will then become part of larger proposals that will undergo the public environmental review process. The Balboa Reservoir project will include a commitment for ongoing monitoring and evaluation to ensure that TDM measures adapt and improve over time to ensure that goals are being met.

The process to develop the Framework also helped align City College's own planning, including their Facilities Master Plan and Sustainability Plan, with San Francisco's TDM policy and practice. And, the Balboa Reservoir development team is looking at the Framework as they proceed in their planning and further transportation needs analysis.

The level of public input we engaged in also identified key community priorities, such as intersection improvements in the Sunnyside neighborhood and the re-design of Ocean Avenue. These have been shared with the Balboa Station Area CAC and will inform approaches and content for the Balboa Reservoir development and City College's Facilities Master Plan.

Conclusion

Ultimately, the TDM Framework sparked an ongoing, productive conversation and path forward for the many ways we can encourage sustainable travel and maintain access for all in the Balboa Area. This is a continuing work in progress and an ongoing conversation and collaboration with the students, employees, and residents in the neighborhood. I want to commend the Planning Department's staff, particularly Jeremy Shaw, for their diligence in developing the Framework and taking the time to incorporate as much public input as possible.

I want to acknowledge the members of the Balboa Reservoir Community Advisory Committee and the Balboa Park Station Area Plan Community Advisory Committee for their time in reviewing the Framework. I also want to appreciate the members of the public for their time and ongoing engagement throughout this process. The Balboa area has so much potential as it serves and intersects diverse neighborhoods. I look forward to the collaboration and will continue to support further improvements to address our current challenges and build upon an infrastructure for future planning in the area.

City Hall • 1 Dr. Carlton B. Goodlett Place , Room 244 • San Francisco, California 94102-4689 • (415) 554-6516
Fax (415) 554-6546 • TDD/TTY (415) 554-5227 • E-mail: Norman.Yee@sfgov.org

This Page Intentionally Left Blank

BALBOA AREA TRANSPORTATION DEMAND MANAGEMENT (TDM) FRAMEWORK

TDM Recommendations for the City College Ocean Campus, the Balboa Reservoir and adjacent neighborhoods

Image: Don Barrett

FINAL DRAFT December 2017

ACKNOWLEDGMENTS

The Balboa Area Transportation Demand Management (TDM) Framework is funded through the San Francisco County Transportation Authority's Neighborhood Transportation Improvement Program (NTIP) and a Metropolitan Transportation Commission (MTC) Priority Development Area (PDA) Planning Grant. The NTIP was established to fund community-based efforts in San Francisco neighborhoods, especially in underserved neighborhoods and areas with vulnerable populations (e.g. seniors, children, and/or people with disabilities). The NTIP is made possible with Proposition K local transportation sales tax funds.

The San Francisco Planning Department and SFMTA would like to thank Commissioner Yee for recommending the Balboa Area TDM Framework for NTIP funding. San Francisco Planning and SFMTA would also like to acknowledge our project partners, including City College of San Francisco, SFCTA, San Francisco Department of the Environment, San Francisco Office of Economic and Workforce Development, Balboa Reservoir Community Advisory Committee (CAC), and Balboa Park BART Station CAC members and members of the Balboa Park community.

The Balboa Area TDM Framework has been prepared by Nelson\Nygaard Consulting, Inc., in coordination with the San Francisco Planning Department and the San Francisco Municipal Transportation Agency (SFMTA).

PROJECT MANAGEMENT TEAM
Carli Paine, SFMTA
Jeremy Shaw, SF Planning Department

CONSULTANT TEAM
Pete Costa, Calli Cenizal, Aliza Paz, Jeffrey Tumlin, Drew Meisel, Nelson\Nygaard Consulting Associates

The project team would especially like to thank the following individuals for their contributions and review:

THE OFFICE OF SUPERVISOR NORMAN YEE
Supervisor Norman Yee
Jen Low
Erica Maybaum

SFMTA
John Knox-White
Jamie Parks
Mike Sallaberry
James Shahamiri
Keith Tanner
Dustin White
Hank Willson

CITY COLLEGE OF SAN FRANCISCO
Barry Chin
Linda da Silva
Jeff Hamilton

DEPARTMENT OF THE ENVIRONMENT
Liore Milgrom-Gartner

OFFICE OF ECONOMIC AND WORKFORCE DEVELOPMENT
Emily Lesk
Ken Rich

SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY
Michelle Beaulieu
Amber Crabbe
Bob Masys

SAN FRANCISCO PLANNING DEPARTMENT
Sue Exline
John M. Francis
Rachel Schuett
Corey Teague

BART
Tim Chan

CONTENTS

See the Existing Conditions Report and additional information at http://sf-planning.org/balboatdm


1

EXECUTIVE SUMMARY

The Balboa Area Transportation Demand Management (TDM) Framework process was designed to initiate collaboration between the City, City College of San Francisco (CCSF), and surrounding neighborhoods in the effort to encourage sustainable transportation choices in the area.

This TDM Framework document is not a plan in itself. Rather, it provides a common foundation for TDM within the Balboa Reservoir, City College, and the surrounding neighborhoods. The document is a supportive resource, which provides recommendations and an understanding of how TDM measures can more effectively encourage sustainable travel choices, reduce vehicle trips and greenhouse gas emissions, limit traffic congestion, and lower household transportation costs.

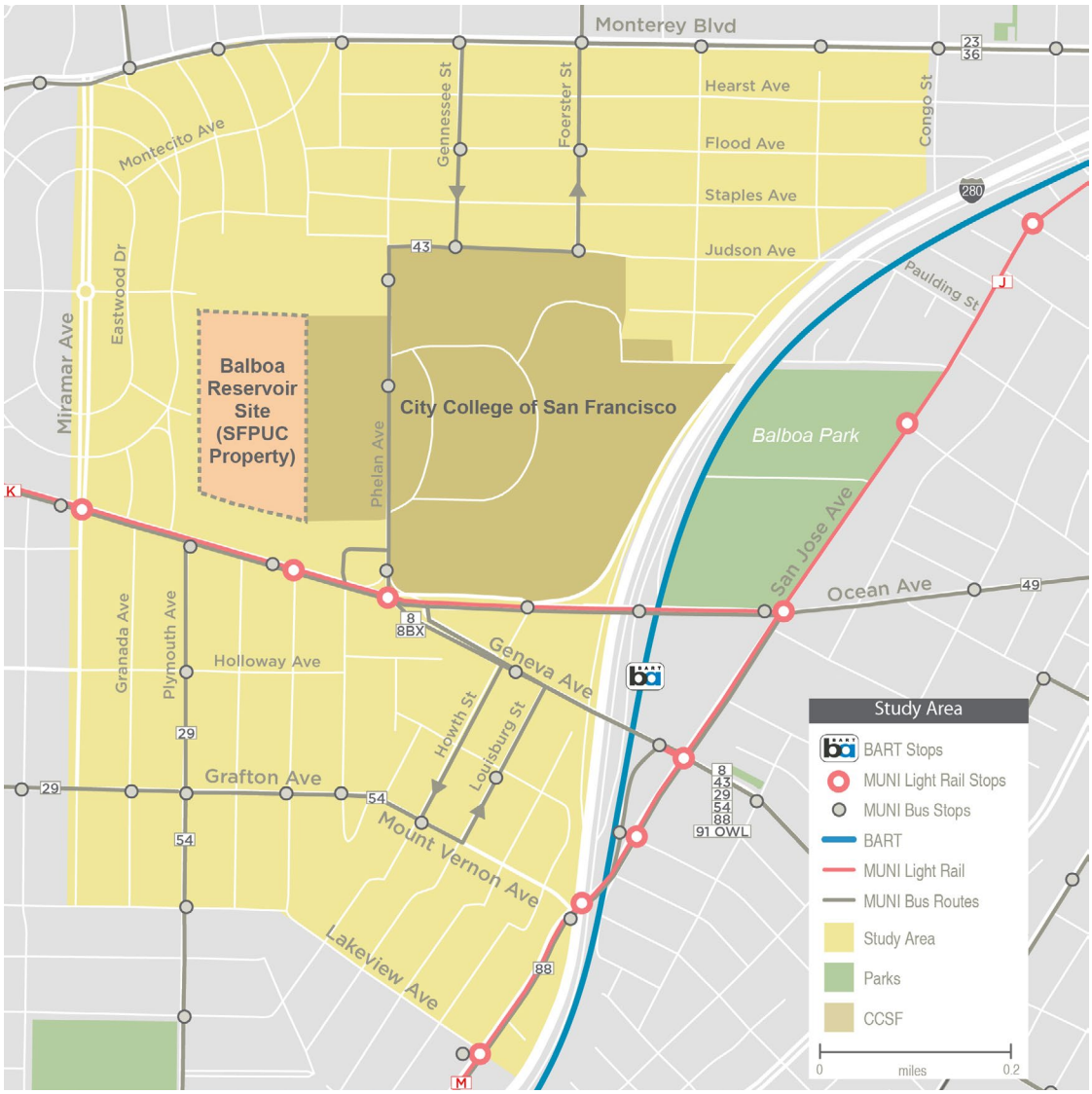
The TDM Framework is built upon a comprehensive Existing Conditions Report (October 2016) for the Study Area (Figure 1), and related findings from the City College of San Francisco's (CCSF) own student surveying and data collection. Chapter 3 summarizes some of the existing conditions and discusses community members' most common concerns – such as traffic congestion and parking availability for residents – as well as community-identified barriers to making sustainable trips – such as first/last-mile issues along Ocean Avenue and personal safety concerns.

Chapters 4 through 6 consist of recommended physical and operational TDM measures for the City, City College of San Francisco (CCSF), and the future Balboa Reservoir site (Figure 2). Each recommended TDM measure includes a path to implementation, suggested targets and monitoring programs to ensure goals are being met.

The measures are designed to address community concerns and encourage sustainable travel choices, while increasing incentives for students in an effort to grow City College enrollment.. They are guided by existing TDM goals embedded in the City College Facilities Master Plan and Sustainability

FIGURE ONE

Study Area for the *Balboa Area TDM Framework*



Plan, in neighborhood plans and in citywide policies. Specifically, the TDM measures presented in this document are guided by four overarching goals for the Balboa Area:

- Reduce vehicle-miles traveled (VMT)
- Reduce auto trips
- Reduce traffic congestion
- Reduce transportation costs to preserve housing affordability

The TDM Framework recommendations have been demonstrated to achieve a reduction in VMT and meet at least one of the other three overarching goals.

Chapter 7 concludes with considerations for the entire study area, focusing on physical and capital improvements that can complement the TDM measures. The TDM Framework is only the beginning of the conversation around TDM in the Balboa Area. The TDM Framework is not an implementable plan. Rather, it informs transportation planning in the Balboa Area and sets the direction for more detailed, implementable measures in the CCSF Facilities Master Plan, City College Sustainability Plan, and future Balboa Reservoir development.

Importantly, the ability to increase sustainable travel and reduce congestion in the Balboa Area from will require ongoing coordination and clear communication between City agencies, CCSF, and the community. In considering the management of vehicle trips to the area, the timing of various transportation and development projects must also be carefully coordinated and communicated to the public and their cumulative impacts must also be coordinated. Although the recommended TDM measures can be implemented independently of one another, employing them concurrently with infrastructure improvements will maximize their effectiveness, while reducing the impacts of vehicle trips on the community.

FIGURE TWO

Summary of Recommended TDM Measures

SUBAREA	MEASURE TYPE	MEASURE DESCRIPTION
CCSF Ocean Campus	Physical	Right-size parking
		Expand secure bike parking on campus
		Provide bike repair station(s)
		Provide affordable housing and supportive services
		Install real-time transit information in key campus locations
	Operational	Hire a dedicated Transportation Coordinator
		Create transportation resource on CCSF website
		Establish sustainable transportation incentive programs
		Launch campaigns that promote sustainable travel
		Establish a student transit pass pilot program
		Provide subsidized bike share memberships for students
		Create a carpool program
		Provide Emergency Ride Home for employees
		Expand safe escort program for students and employees
		Improve signage and wayfinding
		Expand on 2016 Travel Behavior Survey
		First/Last-Mile Feasibility Analyses
		Addressing Demand during Peak Registration
		Adjust parking pricing
		Provide real-time parking availability and pricing information

Summary of Recommended TDM Measures (continued)

SUBAREA	MEASURE TYPE	MEASURE DESCRIPTION
Balboa Reservoir Site	Physical	Provide on-site affordable housing
		Provide on-site childcare facilities and services
		Right-size parking
		Provide parking spaces for on-site vehicle share vehicles, prioritizing peer-to-peer shared vehicles
		Provide secure bike parking above beyond code requirements
		Provide bike repair station(s)
		Install real-time transportation information in lobby
	Operational	Unbundle parking from all tenant leases
		Allow for parking to be shared by different user types (e.g., residents, employees, CCSF students, etc.)
		Provide car share memberships to residents
		Provide subsidized transit passes to residents
		Hire a dedicated on-site transportation coordinator
		First/Last-Mile Feasibility Analyses
Balboa Area Neighborhoods	Physical	Expand car share locations and fleet
		Coordinate with Bay Area Bike Share to locate docks in Balboa Area
	Operational	Expanded on-street parking management
		On-street parking pricing and regulation for Phelan Avenue
		Pilot a senior ridematching program
Area-wide	Physical	Improve intersection crosswalks
		Ocean/Geneva/Phelan Avenue signal timing improvements
		Study Protected Left Turns along Ocean Avenue Ocean-Geneva Corridor Improvements
		Expanded Bikeway Network – Neighborways – Two-Way Multi-Use Paths
		Ocean-Geneva Corridor Improvements
	Operational	Improve transit stop amenities, including real-time transit information
		Establish a Balboa Area staff working group

[this page intentionally blank]

2

INTRODUCTION

WHAT IS TDM?

Transportation Demand Management (TDM) refers to policies, physical amenities, programs, tools, and services that support the use of sustainable modes of travel.

TDM works with the existing transportation system to expand and support mobility options that accommodate future growth while meeting larger City of San Francisco goals. Supporting bicycling, walking, using transit, and carpooling makes it easier for all users to reduce reliance on driving alone, and provides larger environmental benefits through lower emissions, health benefits through increased safety, and community benefits through active public spaces and streets.

Since 2012, the percentage of San Francisco trips made by private auto has been steadily decreasing, even as the overall volumes of daily trips increase.[1] Moreover, the majority of Bay Area adults report that they prioritize walkable neighborhoods and convenient public transit.[2] As communities, regions, academic institutions, and employers across the country leverage these trends, TDM is used to help manage growth, alleviate congestion, and improve the environment. Academic and business campuses develop TDM programs aimed at promoting and providing a diverse mix of transportation choices as a means to attract and retain students and employees. Areas that have a mix of land uses often have an interest in using a variety of transportation options to make places more accessible to residents and employees and, as a result, emerge as vibrant, walkable neighborhoods with desirable amenities. Environmental review also may call for TDM programs or measures as mitigations for air quality and/or transportation impacts.

This chapter provides the larger context for TDM in the Balboa Area, including San Francisco TDM policies and regulations, and summarizes the overarching structure of the chapters that follow.

San Francisco TDM Program

The TDM measures also reflect the intent of the City's TDM Program and other City efforts to manage the transportation impacts of new development and encourage investments in TDM that provide community benefits. Recently, San Francisco created a TDM Program for new development (projects of at least 10 housing units or 10,000 square feet of commercial space) and major changes of use. The TDM program requires new developments to provide on-site amenities that support sustainable modes of transportation and reduce driving trips associated with new development. Each project is assigned a "points target," based on how much parking it provides—the more parking provided on site, the higher the points target and the more TDM a project has to provide. The project meets its points target by selecting from a menu of TDM options, which each have a point value based on how effective they are at reducing driving trips from the project. The selected measures become a project's TDM Plan, which is adopted and recorded as part of the project. Proactive compliance and reporting ensure that the project actually provides the measures that it commits to, once built.

While the TDM Program applies only to specific new developments and changes of use, the same intent and rationale behind the program guides TDM planning citywide and this *TDM Framework*.

BALBOA AREA *TDM FRAMEWORK*

Purpose and Goals

The Balboa Area is changing and will continue to evolve; the transportation challenges facing the community today will continue onto tomorrow until strategic and proactive measures are taken by the City, CCSF, and the community. An "outside the box" approach is paramount, and this *TDM Framework* document provides guidance on what TDM measures can be implemented to achieve area-wide goals in reducing traffic congestion, VMT, and related emissions.

A number of improvements in the Balboa Area are steadily enhancing transit access, transit operations, and pedestrian access and safety around Balboa Park BART station. Yet, as the neighborhood grows, City College enrollment increases, and travel patterns change, there is a need to better manage the transportation demand for City College and surrounding neighborhoods to work with limited roadway, transit infrastructure, and financial resources.

The *Balboa Area TDM Framework* was proposed as a response to this need and to public input provided to the Balboa Park Station Community Advisory Committee (CAC), the Balboa Reservoir CAC, and at public workshops in the neighborhood. The project is funded by District 7 Neighborhood Transportation Improvement Program (NTIP) funds from the SFCTA's Proposition K local transportation sales tax, at the request of Supervisor Yee's office to consider a more effective approach to TDM, given current and future changes in travel due to population and employment growth in the Balboa Area.

The *TDM Framework* is built upon a comprehensive Existing Conditions Report (October 2016), and related findings from the City College of San Francisco's (CCSF) own student surveying and data collection. The Existing Conditions Report summarizes the transportation access and mobility issues, opportunities, and challenges for residents, businesses, public institutions, visitors, and daily commuters traveling in, out of, and through, the Balboa Area.[3] The report draws on site observations, neighborhood travel behavior surveys, and existing planning data and reports from both the City of San Francisco and City College of San Francisco. Data from both efforts validate the results of many previous studies in the area, including key areas of heavy pedestrian, bicycle and vehicle volumes; dangerous intersections, key transit nodes, and variable parking demand. In particular, the studies helped illuminate the areas, hours and times of year of peak parking demand

- for example, during student registration periods. These peaks vary from peak commute hours typically measured in transportation studies. These data sets helped craft the recommendations and illustrate where further data collection and analysis is needed before quantifying measures or incorporating them into a future Plan.

Additionally, meetings with CCSF staff, neighborhood associations, and the public, including presentations of existing conditions and TDM concepts at CAC meetings for the Balboa Reservoir and Balboa Park Station, helped inform the project's understanding of neighborhood needs, interests and opportunities.

The TDM Framework has informed and will continue to inform several community transportation processes in the Balboa Area, including the implementation of the Balboa Park Station Area Plan, the Balboa Reservoir, the CCSF Facilities Master Plan, and the City College Sustainability Plan. The following chapters allude to these documents and their transportation goals.

Many of these preexisting plans already contain TDM goals or discuss managing transportation demand to reduce impacts on the community and neighborhood infrastructure. With an understanding that additional, community-based goals should guide transportation for each of the three sub-areas, Nelson\Nygaard recommends four goals consistent with City and CCSF policy documents to guide this Framework. The four guiding goals are most relevant to TDM and high-level outcomes that apply to the entire Study Area:

- Reduce vehicle-miles traveled (VMT)[4]
- Reduce auto trips
- Reduce traffic congestion
- Reduce transportation costs to preserve housing affordability

Additional goals that are specific to one sub-area or are broader in scope than TDM (e.g. street infrastructure) are also included in the following chapters.

Framework Structure

The remainder of the document contains the following:

- Chapter 2 provides additional context about the anticipated changes in the Balboa Area and their greater implications for managing the area's transportation demand.

- Chapters 3 through 5 target the three specific subareas in the Balboa Area and their respective transportation goals. Each subarea is discussed in a stand-alone chapter:

  - ***CCSF Ocean Campus TDM measures:*** *this chapter is tailored to City College students, visitors, and employees and considers the trade-offs in transportation facility investments.*
  - ***Balboa Reservoir TDM measures:*** *this chapter emphasizes transportation programs and designs to support future residents, employees, and visitors of the future Balboa Reservoir site.*
  - ***TDM measures for Balboa Area Neighborhoods:*** *this chapter focuses on measures applicable to residents, employees, customers, and visitors to the neighborhoods adjacent to CCSF and the Balboa Reservoir*

- Chapter 6 concludes the report with a discussion of Balboa area-wide coordination and investment.

Chapters 3 through 5 include each of the following elements for the respective sub-area:

Goals

The Balboa Area's four overarching goals are drawn from neighborhood plans, CCSF plans, and citywide policies. Given the different populations affected by transportation demand and parties responsible for implementing these measures among the three subareas, the discussion of goals within each chapter shows how these overarching goals align with specific goals of the respective subarea, its responsible party, and/or its target populations.

Targets

Targets establish a concrete way for a given subarea to determine whether the recommended TDM measures are achieving the goals. Again, since the target population's needs and the responsible party's abilities may vary among subareas, these targets are specific to the relevant subarea. Since it is difficult to extract the specific impact of individual TDM measures, a target evaluates how the overall TDM program supports key city, community, and CCSF goals.

Recommended Measures

The *TDM Framework* recommends TDM measures that have been proven successful at contributing to both the City and subarea stated goals. The recommended TDM measures are based on conceptual land use and populations. Detailed information about specific land uses and populations (from plans, such as a proposed Reservoir development plan, or City College's Facilities Master Plan or Educational Master Plan) would be used to later refine the measures and their applications. The measures are grouped into two distinct categories but are designed as a cohesive effort that supports the overarching goals:

- *Physical Measures:* These capital improvements are typically amenities or designs that are specifically constructed or installed in the public realm or on private property. Examples include bicycle parking and affordable housing.

- *Operational Measures:* These individual policies, programs, and communication efforts further support the use of sustainable travel modes. The effective marketing and management of TDM services are essential to a TDM program's success. These efforts incentivize use and raise awareness of sustainable transportation options.

The *TDM Framework* describes each defined TDM measure and explains how the measure meets the stated goals of the city and/or subarea. It also presents possible paths to implement the measure, identifying important steps for the responsibility party (or parties) moving forward. Case studies and best practices of TDM measures are presented throughout the *TDM Framework* to showcase comparable TDM efforts, paths to implementation, and associated outcomes, if available.

Impact and Cost

As discussed in more detail in each chapter, there are often multiple ways to implement each of the measures. Some efforts may have monetary costs, and others may involve a more intangible cost, requiring more time and effort to gather information, analyze data, build support, etc.

As TDM measures are often implemented in tandem, it is difficult to parse out and attribute impacts to each individual element of a comprehensive TDM program. Measures support one another to create high-quality alternatives to traveling by car, and as such, multiple measures implemented jointly can leverage each other for greater impacts when compared to stand-alone implementation. As a qualitative, order-of-magnitude frame of reference, each chapter includes a graphic of the relative impacts and costs associated with each of the measures recommended for that subarea.

Monitoring

Effective management and monitoring are crucial to the success of a TDM program. The responsible parties in each of the subareas need to: ensure their respective TDM measures meet the needs of target populations; define a clear roadmap of how each measure can be developed, funded, and implemented; and prepare specific mechanisms to measure the effect of these TDM measures as they evolve. Since TDM programs are not static, ongoing monitoring can identify what is working best and what measures may need adjustment or replacement.


3
OCEAN

BALBOA AREA CONTEXT

The Balboa Area lies at a crossroads of transportation infrastructure, serves as a major education destination, and is poised for change.

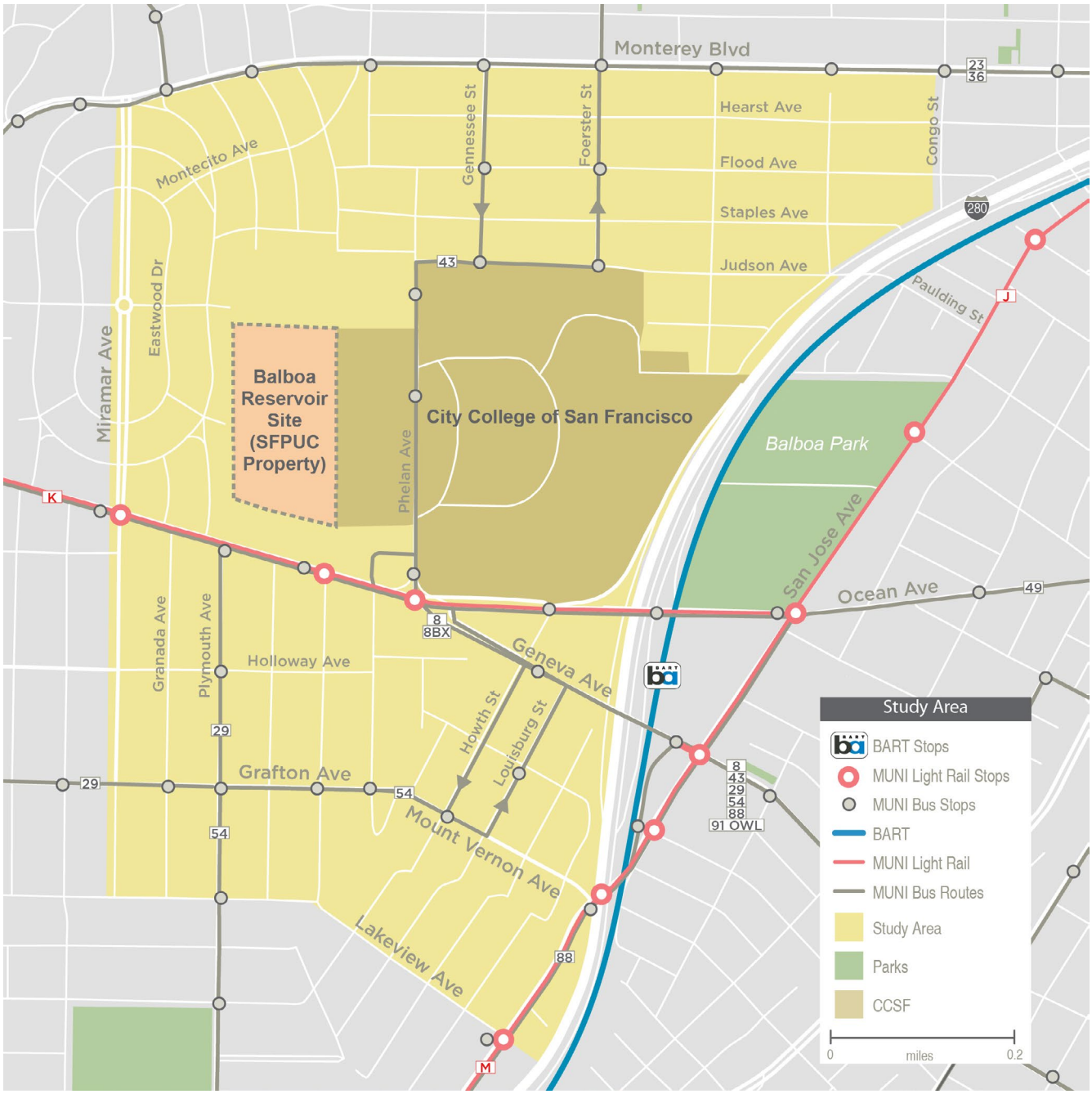
The neighborhood is continuing to grow and CCSF enrollment is increasing. A number of improvements in the Balboa Area are making transit more accessible, including Muni bus and rail operation improvements and upgrades to pedestrian safety around the Balboa Park Bay Area Rapid Transit (BART) station and along Ocean and Geneva Avenues. However, limited roadway space, transit, bike, and pedestrian infrastructure, and financial resources create a need to better manage transportation demand for the Balboa Area as a whole and for the individual subareas.

STUDY AREA

The study area, shown in Figure 3, includes areas in the Westwood Park, Ingleside, and Sunnyside neighborhoods, as well as the City College of San Francisco (CCSF) Ocean Campus. The study area is bound by Monterey Boulevard to the north, Miramar Avenue to the west, Lakeview Avenue to the South, and I-280 to the east. I-280 access on Geneva and Ocean Avenues provides the area with regional vehicle access, and many north-south and east-west arterials in the area provide direct connections to downtown and other neighborhoods. Ocean Avenue is one of the primary east-west corridors in southern San Francisco, crossing the highway to connect the neighborhoods bound by I-280 and US-101 and the Lake Merced area.

FIGURE THREE

Study Area for the *Balboa Area TDM Framework*



Note: Recommended TDM measures presented in this plan pertain to the study area shown in Figure 3, above.

The study area is well served by both regional and local transit, including Muni bus, Muni Metro light rail, and BART. The Balboa Park BART Station is less than one quarter-mile from CCSF Ocean Campus and provides connections to downtown San Francisco, the peninsula, and the East Bay. A number of Muni bus and light rail lines also serves the area, primarily along Geneva Avenue, San Jose Avenue and Ocean Avenue, facilitating connections to BART and throughout San Francisco. Muni provides a number of bus services between Balboa Station and CCSF and the Reservoir site. During peak hours, at least 20 buses per hour provide connections between the station and City College/ Balboa Reservoir. And, during off-peak hours there are at least 10 buses per hour providing this connection. K-line service provides between 4 (late night) and 7 (peak) additional connections to the station. The 8-Bayshore and 49-Van Ness/Mission Muni bus

lines provide frequent service between Balboa Park Station and the Balboa Reservoir and City College. The 43-Masonic line also provides service to City College from the north. Transit service, opportunities and constraints are further discussed in Chapter 3.

BALBOA AREA CHANGES

There are several planned transportation improvements in the Balboa Area and throughout San Francisco aimed to reduce citywide auto demand. However, vehicle travel is expected to increase by 15% in the Balboa Area by 2040, unless there are meaningful interventions that support and encourage other travel behavior.[5] The household population in the Balboa Area is also expected to grow by approximately 6,200 residents and 1,950 households by 2040, in line with citywide growth patterns.[6] CCSF's Ocean Campus is also planning for a 25% increase in student and employee population over the next decade. The SFPUC-owned Balboa Reservoir site, which has been used by the CCSF Ocean Campus as a student parking lot, is now part of the City's Public Lands for Housing program and is expected to be developed for housing. The RFP process for developing a mixed-income development on the site is scheduled to identify a preferred developer in summer 2017.

Ongoing planning efforts to improve transportation access and service in the Balboa Area include:

- Pedestrian safety, accessibility and visibility improvements at the Balboa Park BART Station, including new pathways, overhead structures and entrance areas on the east side of the station;[7]

- Pedestrian improvements around the Balboa Park BART Station, including new and improved crosswalks and signals, curb ramps, wayfinding, and lighting;[8]

- Bicycle improvements along key corridors, such as Ocean, Geneva Avenue, Holloway and Lee Avenues;[9] and

- Improved peak-hour transit frequency and reliability for all Muni lines in the study area, including the 43, 49, J, KT, and M. The 43 line was also extended to Fort Mason and the Presidio Transit Center. [10]

These ongoing and planned improvements to transportation infrastructure in the Balboa Area provide an opportunity for the Balboa Area to implement a TDM program to leverage the existing network; these planned changes; and achieve the overarching goals.

BALBOA AREA | TARGET POPULATIONS

The Balboa Area is primarily residential and zoned for low- and moderate-density residential uses. Ocean Avenue is the primary commercial/ retail corridor and has a variety of services to accommodate the daily needs of residents and visitors to the area including, restaurants, schools, cafes, auto body shops, and churches. Located east of I-280, on San Jose Avenue between Havelock Street and Ocean Avenue, Balboa Park provides diverse athletic uses, including a skate park, a playground, tennis courts, a swimming pool, and baseball fields.

The majority of the 590 Balboa Area households in the study area have an average of three to four residents, with more than 50% of the households possessing two or more cars. This is higher than the ratio in San Francisco, where approximately 28% of households possess two or more cars.[11] In general, approximately 68% of people travel by auto, 13% by transit, 17% walk, and 2% bike, in the Balboa Area.[12] As previously discussed, population and employment in the area are anticipated to

increase. The area pertaining to CCSF, Ocean Avenue, and the Balboa Park BART Station has been designated as a Priority Development Area (PDA), which aims to focus residential and employment growth and supports transit-oriented development. This PDA's specific goals are to build more rental and affordable housing units, and to revitalize streets, commercial uses, public spaces, and enhance transit connections—all relevant factors when considering the study area's ongoing development and TDM efforts.[13]

In addition to the jobs provided by businesses along the major corridors, CCSF's Ocean Campus is the major employer in the area, currently providing over 5,000 jobs. Although over 60,000 students enroll annually at CCSF, approximately 19,600 students take classes at its primary campus in the Balboa Area, Ocean Campus.[14] On average, approximately 13,500 students attend Ocean Campus daily, traveling by a variety of modes from all over the Bay Area: around half of CCSF students travel by transit, with approximately one third of students driving alone.[15] A greater percentage–approximately 4o%–of CCSF employees drive to Ocean Campus. Ocean Campus is also CCSF's largest campus in its network, and CCSF is currently updating their Facilities Master Plan to plan for anticipated student/employee growth and campus development.

The 2009 Balboa Park Station Area Plan identified the Balboa Reservoir, which is currently used for CCSF student parking, as a future site of affordable housing and open space. The process to identify a developer partner for the City and plan the site is currently underway. Since spring 2015, the Balboa Reservoir Community Advisory Committee (CAC) has been meeting to inform development "principles and parameters" for the site. The principles and parameters will guide future design workshops and discussions between community stakeholders, the CAC, City agencies, City College, and the future developer in the effort to create a cohesive neighborhood of mixed-income affordable housing, significant open space, childcare, and other community amenities.

Given the anticipated changes and their implications for the area's transportation network, it behooves the area to consider ways to better utilize the current network. This involves identifying existing resources that are currently untapped or underutilized and examining how TDM can be used to support current needs and the anticipated growth in the area.

The measures outlined in this *TDM Framework* are designed to work together to affect travel habits of residents, employees, students, visitors, and shoppers in the Balboa Area. When multiple measures are implemented jointly, they can leverage each other for greater impacts than compared to implementation of stand-alone measures. Therefore, the responsible parties in the Area—CCSF, the future developer of the Reservoir site, and existing and future residents and property owners, and business owners—will need to coordinate with one another to ensure that their respective TDM measures are most effective and efficient.

COMMUNITY CONCERNS, BARRIERS & OPPORTUNITIES

According to stakeholder interviews, community workshops, past planning projects, and the data gathered about the existing key populations and anticipated changes, the following key transportation concerns, barriers and opportunities ave been identified by community members in the Balboa Area:

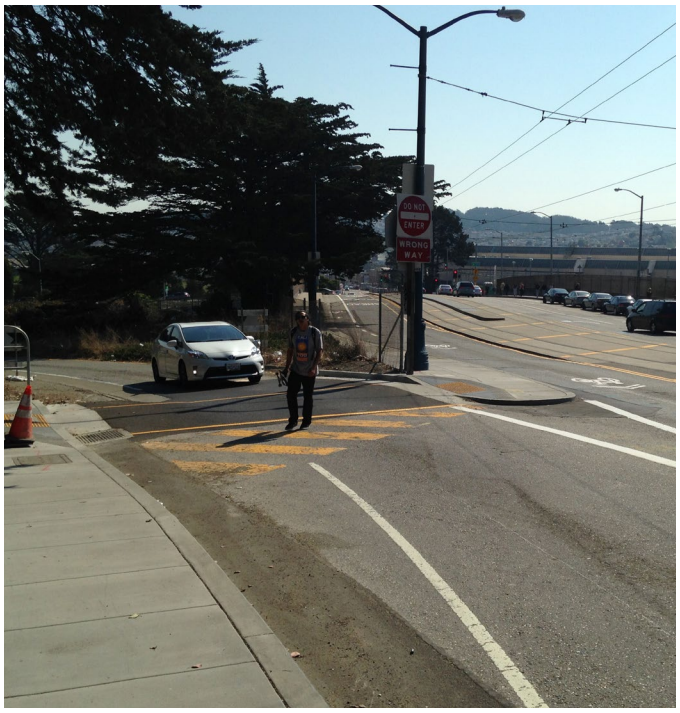
Traffic Congestion

Ocean Avenue and Geneva Avenue are the only through east-west roadways in the entire southern half of San Francisco, connecting the neighborhoods east of I-280 with those to the west. The connection is an attractive route for drivers, including a substantial number of trips that do not have a Balboa Area origin or destination. The mix of regional traffic with local travel leads to peak hour congestion at constrained roadways like the Ocean/Geneva/Phelan intersection.

Residents in the adjacent neighborhoods have specified their concerns in more detail, such as congestion during class hours, congestion around school drop-off zones in the area, rush hour congestion on Phelan Avenue, and cut-through traffic affecting neighbors' quality of life. Concerns about unknown traffic impacts from the future Reservoir development and student enrollment at CCSF also remain at the top of neighborhood input.

Other community members have raised questions about extensive traffic queuing if the southbound, I-280 off-ramp onto Ocean Avenue is re-designed.

Reducing congestion along Ocean Avenue and Geneva Avenue will require citywide regional system changes, in addition to both local and regional investments in TDM.



First/Last-Mile and Walkability issues along Ocean

As the first/last mile for many pedestrians, transit riders, and youth, Ocean Avenue has been frequently cited as a corridor in critical need of improvements to increase pedestrian safety, walkability, and comfort. Narrow and cluttered sidewalks are critical barriers to a safe and inviting walking experience today. Considering today's challenges, community members have concerns over how Ocean Avenue can accommodate future increases in pedestrian volumes from the Reservoir development and growth at City College.

In addition, high traffic volumes and long crossing distances make the following locations particularly challenging and undesirable for pedestrians:

- *Ocean Avenue/Phelan Avenue intersection;*
- *Ocean Avenue/Geneva Avenue intersection;*
- *Ocean Avenue at Balboa Park BART Station west side walkway; and*
- *The I-280 southbound off-ramp at Ocean Avenue, which is*

uncontrolled and has low yield rates to pedestrians from vehicles traveling at high speeds. Current planning efforts to realign this off-ramp are designed to create a safer crossing for pedestrians.

To bridge the first/last-mile challenge, community comments have recognized the need to improve the street design along Ocean Avenue and have called for operational solutions like a shuttle from the Reservoir and/or CCSF campus. A variety of first/last-mile recommendations are discussed throughout Chapters 4-6. Ultimately, both TDM measures and physical improvements to the pedestrian network will be necessary to make walking safe, inviting and efficient.

Personal security

Safety concerns have been brought up time and again as barriers to taking transit at night. Whether walking along Ocean Avenue, crossing CCSF campus, or waiting at the Geneva Avenue bus stop after dark, the lack of personal security remains a significant barrier for many who prefer to take transit.

The lack of buildings and active pedestrian entrances along key pedestrian routes reduces the "eyes on the street" and raises personal security concerns for some people walking at night, including motorists heading to their cars. Segments of Ocean Avenue between the Balboa Park BART Station and Harold Avenue, along Phelan Avenue, or between CCSF and its parking lots all face this challenge.

Additional residential and commercial development in the area, if designed well, could help mitigate these concerns. Although TDM does not address this aspect directly, urban design, building form and scale, for example, are important elements to consider while implementing measures.

Several upcoming opportunities can address safety concerns through better design, including: securing funds for the Ocean and Geneva Corridor Project, the upcoming (2017) design of the Geneva Avenue plaza at the BART station, and the City College Facilities Master Plan - especially creating buildings with pedestrian-oriented frontage along Ocean Avenue and pedestrian connections through campus. Future interim conditions can also be designed to help address safety concerns, such as during the construction of the future performing arts center, the future Reservoir development, and any temporary uses of the sites.

Bikeway Gaps

The Balboa Area contains a number of major gaps in bikeway connections across the southern half of San Francisco, including connections west to San Francisco State University along Holloway Avenue, and east and north to the Mission District via Ocean Avenue, Alemany Boulevard, and San Jose Avenue. These major routes face a difficult gap between Lee Avenue and San Jose Avenue. Of the existing bikeways in the areas, many are underdeveloped and could be enhanced to build a stronger biking network; these areas are discussed further in Chapter 6. Focusing on essential improvements and closing critical gaps in the bikeway network could encourage significant new bike ridership, which can be further supported by operational TDM measures that encourage bicycling.

Parking availability

The varied application of parking management tools, combined with major trip generators (CCSF and the Balboa Park BART station), often makes it difficult for residents to find parking in certain locations at some times of day. Residents have expressed a variety of concerns around limited on-street parking availability during class times, including evening classes, as free street parking in the neighborhoods is more likely to fill up before paid parking on or near campus. The effectiveness of the Residential Parking Permit (RPP) program in making street parking available or providing parking near one's home has been a chief community concern, as is the cost or time

burden of petitioning to expand or establish an RPP zone.

Adding to the challenge of parking availability during class hours, residential driveways are often partially blocked by cars parked on the street - limiting access to or from their own off-street parking.

Strategic management of on-street and off-street parking is one of the most effective TDM measures. While increasing parking availability for residents or those who need it most, managing the parking supply can also reduce VMT and vehicle trips.

Outside the scope of this TDM Framework, several opportunities can help manage some of these challenges, including, for example, potential reforms to the RPP program. SFMTA held a series of neighborhood meetings in 2016 to help inform the ongoing Residential Parking Permit Evaluation & Reform Project. SFMTA also allows residents to apply for color curbs, in particular "driveway red tips," that can help reduce the incidence of blocked driveways.

On-street parking management is discussed further on page 70, including ways to tailor existing parking permit and management tools to neighborhood needs until additional measures are available.

Cost of transit

While Muni has discount monthly passes for seniors, youth, people with disabilities, and low-income riders, BART's distance-based fare structure can quickly add up for San Franciscans for whom BART is significantly faster than Muni and for those who come from outside of the city. For low-income people, selecting between these transit services can be a trade-off between spending more money and spending more time traveling. This equity issue is an important consideration when developing and implementing TDM measures.

Muni speed, reliability, and frequency

While the Balboa Area–particularly the BART station area and City College Bus Terminal–has many transit connections, public experience is that transit service is often slow, unreliable, infrequent, and infrequent at night. Related to the safety concerns above, the frequency of buses like the 43 line (or, as an alternative, the 23 line from Glen Park) has been identified as a barrier to taking transit at night. These experiences and expectations around transit service are presented as challenges today and underlie concerns about the ability to provide sustainable transportation choices in the future, as more students and residents are expected in the neighborhood. Especially with anticipated growth in student enrollment at City College, additional opportunities remain for better understanding student and resident transit needs. These community concerns should remain central to the dialogue between City College, the Balboa Park Station CAC, SFMTA and the Balboa Reservoir stakeholders.

Regional Transit Connections

The need for more frequent or direct regional transit connections to the peninsula has also been identified among community members. In particular, connections to Caltrain are limited and distant, especially 22nd Street station, which has more frequent service than Bayshore Station.

Several opportunities outside the scope of this TDM Framework can help address this barrier to transit. First/last mile improvements to the Balboa Park BART station can lower barriers for many regional trips, helping people connect to BART and the East Bay, Millbrae Caltrain Station and the Peninsula beyond. In addition, the planned Geneva-Harney Bus Rapid Transit service will provide rapid service to the Bayshore Caltrain Station, supporting the case for additional Caltrain service at Bayshore Station.

Understanding Student and Future Demand

Several community comments have supported the need for further study of parking demand, student need, price sensitivity and local travel behavior. The data collected to date (from parking analysis and travel behavior surveys conducted for the Existing Conditions report and the CCSF Facilities Master Plan) support the conceptual, qualitative or early recommendations in this TDM Framework. However, most stakeholders (and this document) recognize that conditions are always evolving. More specific data will be necessary before refining, quantifying or incorporating many of the recommendations into an implementable plan.

Ongoing Community Input & Coordination

With a wide range of transportation, planning and campus projects happening in the Balboa Park area, many community members have expressed concern or confusion about how to communicate transportation needs or barriers to the City, in particular communicating input around transit service. In particular, community members have expressed concern about the need to coordinate future construction and impacts, such as between the potential I-280 off ramp project, Balboa Reservoir, and developments on the CCSF campus.

The Balboa Park Station Community Advisory Committee (CAC) is one venue for community concerns. The CAC advises public agencies on a range of topics from transit service, station area improvements, and street design. It consists of nine members designed to represent the diversity of people, needs and interests in the area.

In addition, transportation projects in the area typically have their own community public processes. Individuals are encouraged to attend a CAC meeting to hear the most recent project updates, but can also read more about the many projects online under the CAC's "project" page.

More acute safety concerns or general feedback on Muni Forward (formerly Transit Effectiveness Project) can also be submitted via 311 (phone) or SF311 (web or app).

Given the overall concentration of auto, transit, pedestrian and bicycle traffic along Ocean Avenue and Geneva Avenue, the area has a range of opportunities and constraints. For all modes, the need for network connectivity between neighborhoods, key destinations such as CCSF, the Balboa Park BART Station, and local businesses is evident. Using community input to this document, the Reservoir development process, and the City College facilities master plan, the following TDM measures can complement the many mobility improvements in the area and help address ongoing needs. Taken together, this framework provides a roadmap to better manage all of our transportation investments, understand the trade-offs, and create a more accessible and livable community.

[this page intentionally blank]

4

CCSF OCEAN CAMPUS TDM MEASURES

The Ocean Campus of the City College of San Francisco (CCSF)—the main campus—is located at the heart of the Balboa Area. As a regional destination and major employer in the area, Ocean Campus generates a substantial level of person and auto traffic. It also represents a singular opportunity to increase student enrollment and sustainable travel.

CCSF is currently developing their district-wide *Facilities Master Plan*, which is a campus modernization effort comprising space management, growth strategies, and campus designs that may affect transportation behavior. With new development on the horizon and existing congestion and safety concerns in the Balboa Area, this chapter identifies transportation demand management (TDM) measures to support sustainable travel behavior associated with CCSF's Ocean Campus.

The CCSF student body is diverse; approximately 60% of Ocean Campus students are part-time, and 90% of them take classes in the morning or in the evening.[16] Transportation costs—including but not limited to the cost of parking, gas, transit fare, and the opportunity cost of time spent traveling—can be significant financial barriers to accessing educational opportunities at CCSF. The TDM approach for CCSF's Ocean Campus considers the importance of providing accessible education and strives to establish equitable transportation choices that meet the needs of all members of the CCSF community who travel by all modes.

The greatest opportunity to improve travel throughout the Balboa Area lies with providing better and more affordable transportation choices for the CCSF community. Although access needs vary because of the diversity of CCSF students and employees, CCSF currently has limited resources to address these needs. This Framework provides an opportunity to think creatively and begin identifying measures that can meet their diverse needs and help grow enrollment.

Other community colleges and universities in California have taken a proactive approach to TDM. As a community college in California, Santa Monica College faces many of the same challenges as CCSF—increasingly constrained parking, growing traffic congestion, and a diverse student body with varied transportation needs—and is also bound by the same legal restrictions as CCSF regarding parking permit pricing and transit pass programs. Yet Santa Monica College has established a broad range of successful TDM measures, including increased parking permit programs and a student fee-funded transit pass program. These and other case studies are discussed further in the chapter.

This chapter describes how CCSF's own goals align with the overarching Balboa Area goals and recommends a target to determine whether these goals are achieved. It also provides specific TDM measures that support the goals, with possible paths to implementation for each measure.

The chapter concludes with recommended monitoring to ensure that these measures effectively support the Balboa Area's TDM goals and achieve the recommended target.

TDM GOALS

As discussed in the introduction, this *TDM Framework* is guided by four TDM goals that are common to the City, CCSF, and the Balboa Reservoir site. While the TDM measures in this chapter are recommended based on their fulfillment of these guiding goals, these overarching goals are also reflected in similar goals, policies, and objectives in two major CCSF documents:

- The *CCSF Sustainability Plan* establishes a goal of 15-20% reduction in auto trips over the next 5-10 years and promotes transit and non-auto use to access all campuses.

- The *Draft CCSF 2016 Facilities Master Plan* focuses on improved access and safe pathways between Ocean Campus and the surrounding community for all transportation modes. The document also discusses the desire to optimize parking resources in order to lower facilities, construction, and maintenance costs and continue to accommodate vehicles with appropriately-sized parking facilities.

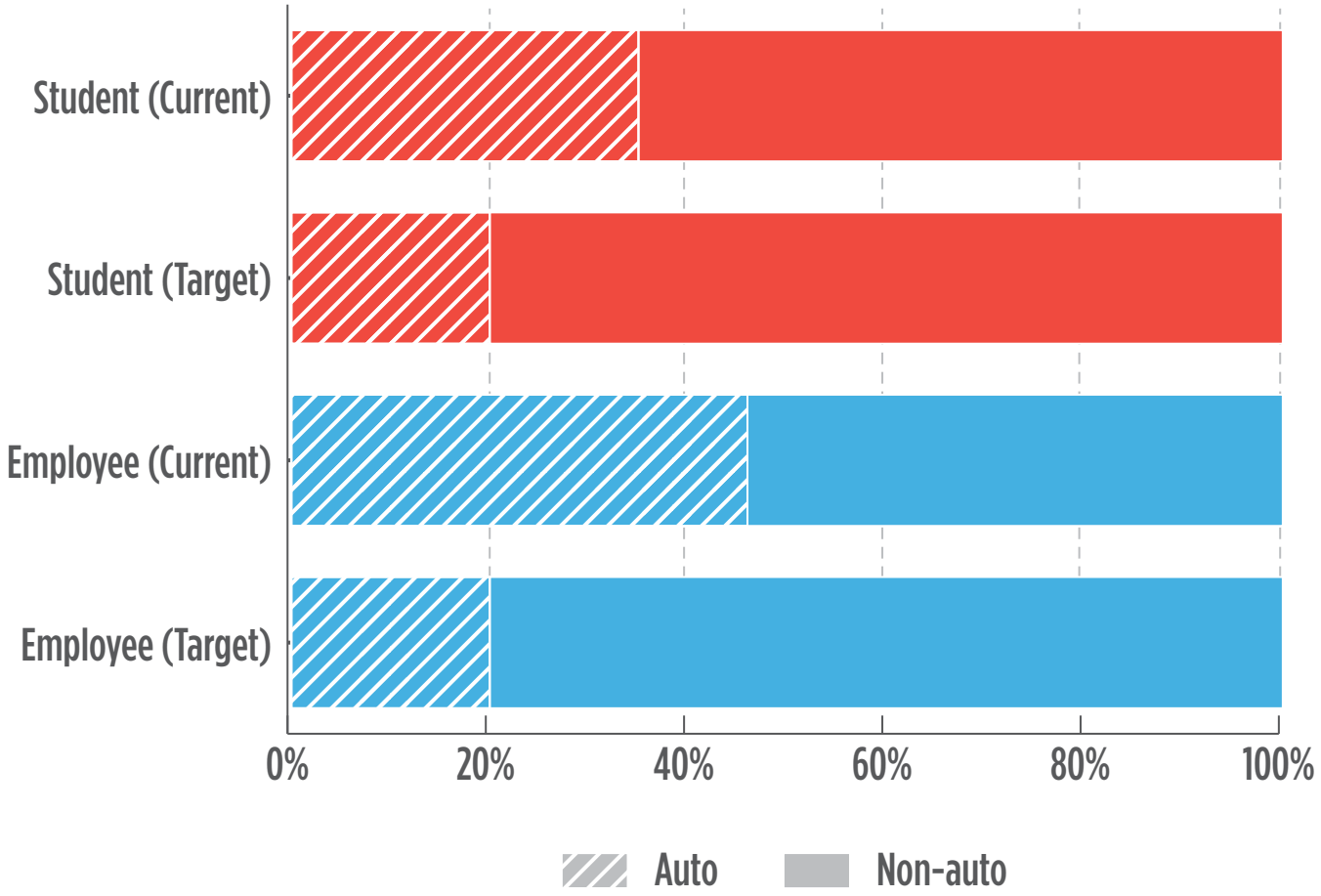
- The Balboa Reservoir RFP Principles seek to ensure that the educational mission and operational needs of City College are not impacted by the Reservoir. Consistent with this TDM Framework, the document and many community members call for a collaborative, appropriate parking and transportation demand management plan that accommodates City College student and employee demand at full enrollment, including access to the City College's future Performing Arts and Education Center.

The measures presented in this chapter work together to achieve the overarching Balboa Area goals as well as the CCSF-specific goals to the extent possible. Many measures that work towards auto trip reduction produce additional benefits of improved access and safe connections for all modes.

TDM TARGET

The *TDM Framework* recommends establishing an auto mode share target, based on the overarching goals of VMT, auto trip reduction, and the effect of TDM measures on student and employee travel behavior. CCSF should aim to achieve an auto mode share of no more than 20% among its students and employees. Based on existing travel behavior data from past surveys (see *Balboa Area TDM Framework* – Existing Conditions Report), the recommended target aims to reduce the auto mode share and increase

FIGURE FOUR
Current and Recommended Mode Split, CCSF's Ocean Campus



the transit, bike, and walk mode shares for both CCSF students and employees. Figure 4 shows the relationship between current auto mode share and recommended auto mode share target for the campus.

PHYSICAL MEASURES

Right-size Parking Supply

Right-sizing parking means striking a balance between parking supply and demand. Overbuilding parking supply leads to increased automobile use, contributing to more vehicle trips, traffic congestion, higher construction costs, and greenhouse gas emissions. Constructing new parking facilities at the Ocean Campus requires a substantial investment, while leveraging measures in this *TDM Framework* limits the need to build more parking and may result in cost savings up to $58,000 per parking space.[17]

Recommendation and Paths to Implementation

CCSF should determine the appropriate parking supply for the CCSF Ocean Campus by developing an ongoing monitoring approach to analyze how often, where, and when parking is utilized. As the recommended TDM measures for CCSF are implemented, the monitoring effort will reveal the overall impact on campus-wide parking demand and on the travel behavior of students, employees, and visitors. This data will allow CCSF to better assess the actual need for an increased parking supply.

Data collected through this ongoing monitoring program can be used to develop additional parking management solutions to use the available supply efficiently, and reduce the need to overbuild new parking. (Currently there are nearly 3,000 parking spaces on Ocean Campus, used variously for employees, students and visitors and occupied at varying degrees depending on the time of day. As a point of reference, approximately 960 spaces are in the lower Reservoir and 775 in the upper Reservoir lot. See Existing Conditions for more information.) For instance, if parking demand by employees consistently exceeds supply while student parking is underutilized, campus lots may be opened to all drivers to reallocate demand.

Alternatively, if overall parking demand exceeds supply at certain times, the parking management process can be adapted (e.g. adjusting time limits, parking prices, etc.) and additional TDM measures that encourage using other modes may be offered as appropriate. CCSF may also pursue a shared parking agreement with nearby residential facilities and/or future developments (e.g., Balboa Reservoir site); Chapter 4 discusses shared parking in greater detail.

Right-Size Parking Best Practices

- Use economic and parking analysis to construct new parking supply only as needed, understanding the trade-offs for different groups of the CCSF community, including those who require vehicle access and parking.
- Plan for the typical use of parking rather than peak use when evaluating the need for more parking.
- Implement other TDM measures in tandem with parking pricing initiatives to incentivize all transportation modes equitably.
- Coordinate the amount of parking with potential shifts in demand resulting from parking pricing and complementary TDM measures.
- Support TDM program with parking revenue.
- Establish shared parking agreements with other nearby off-street parking facilities.
- Ensure all information about parking locations and pricing is readily available and comprehensible to the CCSF community and the public.
- Use data collected for this effort to support the recommended parking pricing program and/or information distributed about sustainable transportation options.

Install Secure On-Site Bicycle Parking

Adequate, convenient, and secure bicycle parking offers riders a greater level of access and security and reduces barriers to riding a bike to campus. Bicycle parking on campus and near building entrances reduces barriers to using a bicycle as a primary travel mode to campus. As this measure makes it easier for those riding a bike to campus, the bike mode share will likely also increase as the bicycle network with the Balboa Area and to surrounding neighborhoods improves.

San Francisco *Planning Code* requires that post-secondary education institutions provide one secure bicycle parking space (Class I) for every 20,000 square feet of occupied floor area, and one publicly-accessible bicycle parking space (Class II) for every 10,000 square feet of occupied floor area. The recommended bicycle parking ratio for colleges or universities is determined by the student and employee population, estimating that the school should provide at a minimum the number of bicycle parking spaces equivalent to 6% of the total student population plus 3% of the number of employees.[18]

Recommendation and Paths to Implementation

CCSF should inventory the existing bicycle parking supply and ensure at a minimum that the bicycle parking provided on campus meets City *Planning Code* requirements in quantity and design. As part of the *Facilities Master Plan* process, CCSF should consider expanding the bike parking supply of both secure (Class I) and publicly available (Class II) bike parking to supply parking for 6% of the projected student and 3% of the projected employee population. This process should identify areas on campus to locate bicycle parking that is desirable for students, employees, and visitors; the space should be flexible to allow for increased supply, should demand warrant it.

On-Site Bike Parking Best Practices

- *Locate bicycle parking facilities in easily accessible, well-lit, and attractive locations close to main entrances that experience high pedestrian traffic to promote active surveillance; bike parking facilities should be located on the ground floor if possible to reduce transporting bicycles up and down stairs.*

- *Class I facilities can include weather-protected cages or be designated rooms inside buildings that require key access. Key access is provided by distributing keys to registered bicyclists or assigning permission to existing student cards.*

- *Class I bike parking should include a mix of rack types, including those with lift-assistive technology for people with limited upper body mobility.*

- *Design bicycle parking to be as secure as possible (e.g. key access in monitored and closed areas).*

- *Co-locate repair stations, outlets to charge electric bicycles, and large parking areas for cargo and other large commuter bicycles.*

- *Locate bicycle parking near access to existing bikeways; the Community Health and Wellness Center, for example, offers a level connection to Ocean and Holloway Avenues, two adjacent bikeways.*

Bike Repair Stations

Bike repair stations further reduce the barriers to owning and riding a bike by providing tools and amenities. A dedicated space contributes to social acceptance of bicycling and reduces one key barrier associated with owning a bike–concern about complications related to ongoing maintenance–by providing tools and parts in a designated, secure area. A bike repair station can ensure that someone who bicycles to campus has space and tools to do minor repairs that may occur on the way to campus (e.g., a flat tire).

Recommendation and Path to Implementation

As part of the process to determine the location for bike parking, CCSF should ensure that adequate space is set aside for installing at least one bike repair station on campus. This space should be adequate for a bike stand and the necessary tools and supplies. The tools may be free floating or attached to the bike stand or work bench. Similarly, the supplies (e.g., patch kits, tubes, grip tape) may be provided for free or available for purchase through a vending machine.

Bike Repair Station Best Practices

- *The bike repair station should be in a secure area within a building, such as a bike parking room or a building garage.*
- *Tools and supplies should include, at a minimum, those necessary for fixing a flat tire, adjusting a chain, and performing other basic bicycle maintenance. This may include a bicycle pump, wrenches, a chain tool, lubricants, tire levers, hex keys/Allen wrenches, torx keys, screwdrivers, and spoke wrenches.*
- *Occasional fix-it tutorials or trainings on minor repairs and maintenance can support bicycle commuters in having the skills and confidence to do their own repairs when needed.*

Affordable Housing and Supportive Services on Campus

Research has demonstrated the important effects of affordable housing on travel demand. Projects that incorporate affordable housing usually have lower parking demand and vehicle trip generation rates.[19] This typically occurs because there is a lower auto ownership rate among residents in these units. Moreover, there is a high need for affordable housing for the CCSF community as well as in San Francisco in general. CCSF's 2004 Master Plan cites that the majority of staff and faculty live outside of San Francisco, in large part due to the high cost of living. The *Balboa Area TDM Plan – Existing Conditions Report* confirmed that students travel from all over the Bay Area to attend classes at Ocean Campus. Providing affordable housing and additional supportive services (e.g. childcare, employment services, etc.) on campus reduces the need for students and employees to make an additional trip, by car or other mode, outside of the campus.

Recommendation and Path to Implementation

CCSF should investigate the feasibility of constructing affordable housing on-campus or nearby for students and employees. The current draft CCSF Facilities Master Plan also includes potential housing on Ocean Campus. As part of the Facilities Master Plan development, CCSF may consider providing or partnering to provide affordable housing, including short-term student and long-term housing for employees. CCSF may also want to consider adding or coordinating allocating space for certain supportive services, such as additional childcare facilities.

Affordable Housing Best Practices

- Affordable housing of all types should be encouraged, but should strive for 100% affordable housing, with between 20-25% of the units set aside for individuals with incomes less than 55% of the median income[20]
- Sites should be located close to transit stops, have convenient access to bicycle and pedestrian facilities, and have clear signage and wayfinding
- Provide a robust suite of TDM amenities to support households' trip needs

Real-Time Transit Information in Key Campus Locations

Providing students, employees, and visitors to CCSF with real-time updates on transit availability in the area allows them to better plan transit trips and trip connections. The easy availability of real-time transit information reinforces transit as a reliable transportation option and makes it easier to plan non-driving trips. Real-time transit information also contributes to more realistic wait times, reduced anxiety and frustration to using public transit, and an increased sense of general safety.[21]

Recommendation and Paths to Implementation

CCSF should display dynamic transit information in building lobbies or use a similar approach based on state-of-the-practice technology at the time of installation. CCSF may pursue a partnership with TransitScreen©, or developers of similar dynamic signage, to determine the specific format of the information.

Real-time transit information may be displayed on screens throughout CCSF's Ocean Campus, particularly in high traffic areas such as the Wellness Center, library, and Student Union. These screens may also show bike parking locations, parking availability, and nearby car share and bikeshare locations and availability.

Real-Time Transit Information Best Practices

- Install screens in high traffic areas
- Include additional information including transit routes, stop locations, walking and biking travel times, and locations of additional nearby transportation options (car share, bikeshare, scooter share)

OPERATIONAL MEASURES

TDM Coordinator

A TDM coordinator provides oversight and management of an entity's TDM program. This position is responsible for the implementation of TDM measures, and could serve as a liaison between CCSF and the City.[22] The coordinator increases the awareness of TDM measures within the CCSF Ocean Campus population by being a point of contact for all transportation information and providing the most up-to-date information about TDM programs and travel options through various channels. Consistent and reliable transportation information can encourage people to try new ways to get to campus and supports a general change in travel behavior over time.

For CCSF, this position would be responsible for maintaining information about CCSF's transportation programs and would assist students, employees, and visitors with transportation-related questions and concerns. The coordinator would oversee the management and marketing of all measures and would have the authority to implement TDM measures. The TDM coordinator would also be responsible for monitoring the success of the TDM program and be responsible for adjusting the program as necessary to achieve CCSF's TDM goals.

Recommendation and Paths to Implementation

CCSF should designate a TDM coordinator for Ocean Campus. This may be a full-time CCSF employee, or it may be contracted through a third party provider. Although this *TDM Framework* primarily discusses CCSF's Ocean Campus, this position could coordinate and oversee transportation programs and policies across all of CCSF's campuses and, if proved necessary, oversee larger improvements to inter-campus transportation.

This position could serve as liaison to any transportation-related staff of nearby private developments and the San Francisco Planning Department and other relevant City agencies to ensure updated information is readily available to the CCSF community and the Balboa Area overall. The coordinator will also facilitate City staff access to the campus for data collection and inspection of TDM implementation as necessary, and will be responsible for compiling any associated monitoring reports.

The position could be placed in a number of offices, although it is recommended that the position be a part of facilities or sustainability staff. A grant could potentially help start the position and focus on a concrete project

TDM Coordinator Best Practices

- Ensure position is full-time and dedicated solely to transportation management
- Ensure regular communication between the coordinator and relevant departments (e.g. Human Resources, Facilities, Sustainability, Admissions, Student Life, etc.)
- Ensure leadership-level support for TDM goals and program
- Ensure position has adequate administrative and financial support to develop, implement, monitor, and adjust the TDM program as necessary

with measurable deliverables. The following recommendations, such as communications resources, travel surveys, or the transit pass pilot, could be places to start.

Create Transportation Resource on CCSF Website

Mobile-friendly websites are an easy way to create a dynamic and engaging repository for transportation information, point-to-point navigation tools, travel suggestions, user engagement campaigns, and other efforts to raise awareness of alternatives to drive-alone travel options. This effort would encourage student and faculty mode shift to non-driving modes.

Recommendation and Paths to Implementation

To make transportation information readily available to the CCSF community, the college's website may include the following:

- A user-friendly interface that is accessible on-line and from a mobile device
- Detailed information on how to access CCSF Ocean Campus by all modes, including the location of bike parking on campus
- Real-time transit information, e.g. NextBus integrations
- A personalized trip planner that allows users to view possible routes and travel time by mode (e.g. transit, bike, and walking).
- Links to sign up for additional information on participating in transit, biking, and carpool programs and groups
- Information to reduce the incidence of parking in front of residential driveways

Website Best Practices

- User-friendly interface
- Regularly updated transportation information
- Links or embedded maps that allow for personalized trip planning by all modes

Website development may come from the recommended TDM coordinator, an internal CCSF department, an outside consulting firm, a CCSF student group, or a class interested in website design.

Sustainable Incentive Programs

Incentive programs encourage students and employees to use non-drive alone modes through benefits and challenges, with a variety of incentives as prizes, such as gift cards and student bookstore discounts. These programs encourage mode shift away from driving, raise public acceptance, and support among the campus community.

Recommendation and Paths to Implementation

To distribute incentives for non-drive alone trips to campus, CCSF would need to facilitate reporting of how students and employees get to campus on a daily basis. CCSF could establish a platform in which students and employees can log the number of times they travel to and from the Ocean Campus using sustainable transportation (bike, walk, or transit).

This platform may be developed and maintained internally by CCSF, or may be provided by private software companies such as Luum or RideAmigos. Students and employees may log their trips individually, or could form teams or groups as part of a specific challenge to complete a certain number of rides in a set time. CCSF may also consider partnering with a ride-hailing company to encourage shared rides taken between the Ocean Campus and other locations.

Students that log the most trips (or a predetermined number) could qualify for a variety of benefits, such as bike vouchers and gift cards. Subsidies could be provided for shared rides (e.g. Lyft Line or UberPool), where riders can share trips with others who are traveling between the same general areas.

Case Studies

University of Louisville

The University of Louisville created its Earn-A-Bike Program in 2012, providing a $400 voucher to students, faculty, and staff who relinquish their parking permits for two years and commit to traveling to campus without driving. Vouchers can be used toward the purchase of a bicycle, helmet, lock, and other equipment. Funded through the university's Climate Action Plan, the program has seen 1,550 participants in the first four years.

Santa Monica College

Santa Monica College (SMC) employees who log commuter trips at the SMC-specific trip planner, Corsair Commute, can earn $15 to $30 per month for using sustainable transportation (30% to 100% of all trips). Employees who qualify for three consecutive months in a given academic quarter are entered into a prize drawing for one of four $50 gift certificates.

Campaigns to Promote Sustainable Travel

Transportation-oriented events raise public awareness of programs and acceptance for non-motorized transportation. These events also establish and build connections within the CCSF community among those who regularly bike, walk, and ride transit.

As discussed in the prior strategy, sustainable travel incentives have been shown to facilitate a measurable shift in driving alone by reducing the overall cost of non-driving modes. Therefore, sustainable transportation marketing services that focus on individual needs can reduce vehicle trips and vehicle miles traveled, support transit and active transportation more, and reduce overall GHG emissions.[23]

Recommendation and Paths to Implementation

CCSF should host regular events open to the CCSF community, and establish campaigns promoting, incentivizing, publicizing, and encouraging transportation by sustainable modes.

Creating and branding a program that proactively engages students is critical to success. CCSF may host a bi-annual "Transportation Day" to coincide with registration or orientation where the TDM coordinator and other relevant staff or SFMTA representatives are on hand to promote transportation programs and answer questions. These events may consist of tables or booths where students can receive information, purchase parking or transit passes, and join carpooling groups, or can engage with larger audiences through games and giveaways.

Behavior change campaigns may range include challenges, marketing, from social media blasts, or contests with prizes for individuals or groups who bike, walk, or take transit the most to and from campus.

Sustainable Travel Best Practices

- Partner with local organizations and student groups to distribute campaign information
- Widely advertise "Transportation Day" in advance through a variety of channels, including social media and email
- Incorporate "Transportation Day" into the standard academic calendar
- Leverage events to survey the CCSF community about travel behavior and preferences

CCSF Transit Pass Program

Providing students at CCSF's Ocean Campus with a subsidized transit pass reduces the financial barrier to riding transit for school-related trips, making it easier for students to ride transit instead of driving. A transit pass program increases students' awareness of nearby transit options, and supports transit as a reliable option for one's primary transportation mode. Passes that permit unlimited travel on Muni and include BART trips that begin or end at the Balboa Park Station would maximize the appeal and impact of a student transit pass program. Student transit passes can potentially have a positive impact on school attendance by lowering the financial cost of getting to and from school.

Recommendation and Paths to Implementation

Pending further discussion with relevant regulatory and transit agencies (e.g., Metropolitan Transportation Commission [MTC], SFMTA, BART) and students, CCSF should establish a transit pass available to students at a discount lower than what is currently available to the public.

To fund a transit pass program, CCSF may use class fees through student approval and/or seek outside funding sources.

Currently, Muni operates a Class Pass program that offers a discounted monthly pass for unlimited rides on Muni to college students; student fees typically fund the pass, while academic institutions are responsible for pass distribution and financial administration. However, California Education Code sections 76360-76361 limit the fee amounts that community colleges may require of students for parking services and discounted transit pass programs. Student fees to fund a transit pass program must be passed by a student majority vote, with fees ultimately capped at $70 per semester per student.[24]

If desirable, CCSF should pursue further research into the amount allowable under California Education Code to be charged for transit passes. Although semester fees for a transit pass may not exceed $70 per student typically, regulations allow for these fees to increase under certain circumstances. Other potential funding sources may need to be considered.

As part of discussions with SFMTA, BART, and MTC around the costs and logistics associated with implementing this program, CCSF will have to determine the specific market of students who would be eligible to purchase and receive the transit pass. The costs of transit passes are typically based on the size of eligible student population, any anticipated change in transit ridership, and the available/needed transit capacity.

Case Studies

Other universities have shared that strong support from the student body is essential to successful implementation, in terms of program development and participation.

San Francisco State University

The first of its kind in the Bay Area, San Francisco State University (SF State) recently created the Gator Pass, a discounted Clipper Card that allows students unlimited rides on Muni and 25% discount on all BART trips that begin or end at the Daly City BART Station, the closest to SF State's campus (located about one mile west of CCSF's Ocean Campus). In 2007, SF State, Muni, BART, and MTC signed a memorandum of understanding (MOU) demonstrating their joint support to find a revenue-neutral way to provide student transit passes. Strong student body support was critical (73% voted in favor of the pass and fees), as well as local and state political support. Students approved a fee structure in which all students must pay $45 per month to fund the pass, with $31 allocated to Muni, $2 for SF State administrative costs, and the remainder to BART. SF State will begin enrolling students in the program to take effect in August 2017.

Since 2008, the drive-alone rate for commute trips to SF State has decreased by 23% and total number of auto trips per day has decreased by 22%. In addition, transit usage has increased, with 45% of campus affiliates using Muni and 27% using BART for a portion of their trip to campus. This is an increase of 24% and 25%, respectively.[25]

Santa Monica College

In light of the growing traffic congestion in the region and increasingly insufficient parking capacity near campus, Santa Monica Community College (SMC) implemented a one-year demonstration project in 2007 to provide students and staff with unlimited trips on select key routes of the Big Blue Bus (BBB), the municipal public transit provider. The following year, SMC students voted to institute a student fee that would financially support this transit pass program. Currently, all students and staff with valid SMC ID cards are allowed unlimited rides on all BBB routes, now called the "Any Line, Any Time" program. SMC reimburses BBB a fixed annual amount based on an average rate per boarding multiplied by the estimated number of passengers boarding and alighting at stop adjacent to SMC. It is partially funded through SMC Associated Student Body fees, which amounts to approximately $9.50 per student per semester for the transit pass. The other half of the contract comes from the Santa Monica Community College District with their state funding. From 2014 to 2016, the percentage of students driving alone to campus has decreased from 37% to 34%, while the percentage using public transit has increased from 45% to 52%.[26]

Subsidized Bike Share Memberships

Bay Area Bike Share (BABS) has stations throughout San Francisco and the Bay Area. Future plans include expanding the regional bike share program to the Balboa Area, including the Balboa Park BART Station, City College, and nearby destinations. It is anticipated that there will be one BABS station at the Balboa Park BART station with room for 19 bikes, to be operational by 2018.[27] Subsidized bike share membership can further encourage biking as a primary mode of transportation and help bridge the first- and last-mile gaps between key destinations.

Members of BABS can take free, unlimited 30-minute one-way bike rides between bike share stations. Once the system's expansion is complete (planned for spring 2017 through 2018), annual memberships will cost $149 per year. Providing students and employees with bike share memberships could help those with minimal experience bicycling in San Francisco a low-cost and low-obligation opportunity to try cycling, and it would provide them with a quick and easy way to get to the Balboa Area BART station for BART connections and a variety of other transit options and recreational activities.

Recommendation and Path to Implementation

CCSF should encourage the use of future Bay Area Bike Share (BABS) stations to travel between campus and transit facilities (e.g., Balboa Park BART Station), and transit-to-home (or work) trips through:

- Establish pods at the campus and at the Balboa Station
- Subsidized or discounted bike share memberships for students and employees.

Discounts on bulk BABS membership purchases are also possible and can help lower barriers to participation.[28] The details of this discount would be negotiated directly with Motivate, the company that operates BABS.

Bike Share Best Practices

- *Bike share memberships should be offered for the entire period that an individual is enrolled or employed by CCSF.*
  - » ***At Santa Monica College, students and staff can receive special membership rates at a local bike share company (Breeze Bike Share), in addition to special rates for car sharing (Zipcar) and car rental.***
- *Bike share docks should be no more than 1,000 feet apart from one another in order to establish better coverage and access.*

Establish a Carpool Program

Approximately 3% of CCSF employees and students currently carpool to CCSF's Ocean Campus. Reserving the most convenient parking spaces for car/vanpool vehicles encourages people to share rides to campus and reduces the overall number of vehicle trips to campus, which also reduces the total amount of parking needed on campus. An increase in carpool trips can further support the overarching goals by reducing traffic congestion, greenhouse gas emissions, and overall vehicle miles traveled (VMT) because of the increase in the number of occupants per vehicle and reducing the number of people driving alone.

Recommendation and Paths to Implementation

CCSF should first review the existing parking supply and determine the potential for carpooling within the CCSF community. To increase the number of carpool trips to campus, the TDM Coordinator may connect with an existing ride matching or vanpool program (e.g. VRide, Scoop, etc.), or may manage a listserv or online forum for students and employees interested in sharing rides to campus.

A certain number of spaces may be dedicated to carpool or vanpool spaces; the number of spaces could be increased based on demand with a cap of a certain percentage (2-10%). These spaces should be prioritized on CCSF parking facilities by locating them more prominently in more desirable spaces, such as near building entrances.

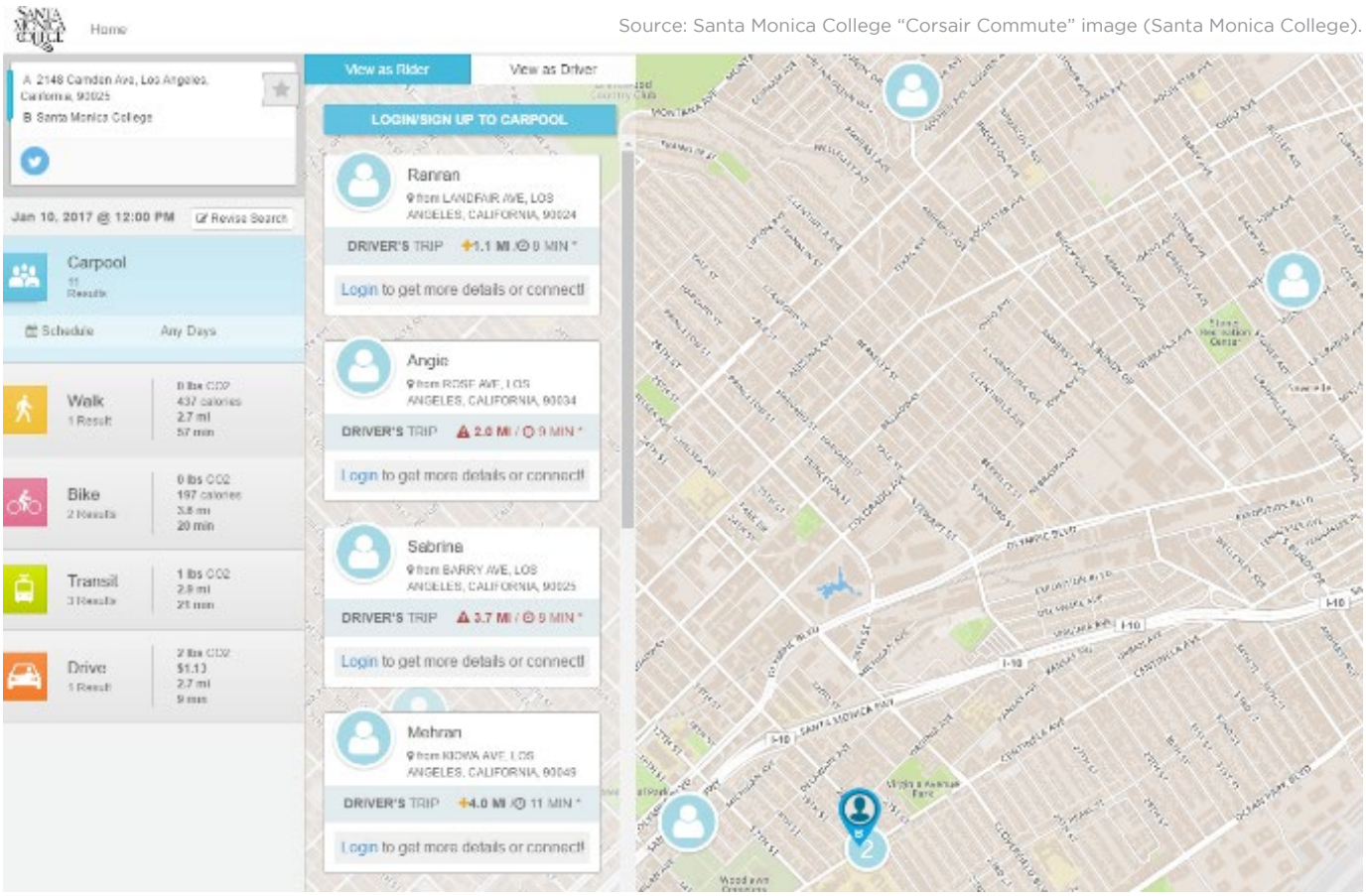
Carpool registration procedures may be included as part of the existing parking permit program; CCSF should determine any eligibility requirements and distribution methods for receiving a carpool permit. Permits may be discounted from the cost of a typical parking permit; under California Education Code, CCSF may not charge more than $35 per semester for a carpool parking permit.

To ensure compliance, a visual monitoring and enforcement program may be set up. There are many platforms available to assist with this process; the correct approach will depend on the specific approach and how it is implemented.

At a larger scale, CCSF may establish its own vanpool program, in which it subsidizes the costs of a van(s) that transports students and employees between Ocean Campus and other key destinations. The van(s) could also serve other CCSF campuses, enhancing inter-campus transportation. Similarly, CCSF may partner with Chariot, Scoop, or another company that provides dynamic vanpool services.

Carpool Best Practices

- *Place carpool spaces near building entrances and in other convenient and desirable locations*
- *Ensure that the process to obtain a carpool parking permit is clear and easy*
- *Require that both drivers and riders apply and receive a carpool parking permit; the permits of both driver and rider(s) must be displayed while parked*
- *Require that students and employees who wish to receive a carpool permit register each semester to validate their commitment to carpooling*
- *Maximize compliance through regular and ongoing communications with the CCSF community*



Source: Santa Monica College "Corsair Commute" image (Santa Monica College).

Case Study

Santa Monica College's (SMC) Corsair Commute platform helps students and employees find potential carpool matches. It also allows employees to track their commutes, earning credits towards a Sustainable Transportation Incentive. SMC also has a vanpool program through vRide, a private provider that coordinates the trip scheduling, ride-sharing, and pick-up and drop-off locations. The first ride is free, with a minimal fee for subsequent trips depending on distance and travel time.

Emergency Ride Home Program

Emergency ride home programs (ERH) reduce the dependency on driving by providing a guarantee that, if an approved emergency occurs, a convenient ride home will be covered. In this way, individuals who worry about being dependent on transit, biking, or walking when time may be of the essence have this option as a safeguard.

Recommendation and Paths to Implementation

The City of San Francisco's Department of the Environment has a countywide ERH program where employers can register at no cost. CCSF can register online for free at www.SFERH.org. If CCSF joins the City's program, the City ERH program would provide any CCSF employee who gets to work by a sustainable mode to be reimbursed (up to $150 per ride) for a ride home in case of unexpected illness, unplanned need to work late, or other unforeseen circumstances that may arise. Employees who experience an emergency will need to submit a reimbursement

request directly through SFERH online, or through the mail. Once the request is verified as eligible, the reimbursement is mailed directly to the employee in six to eight weeks.[29] CCSF may consider establishing a similar program for students.

Emergency Ride Home Best Practices

- Enroll in and widely distribute information about Emergency Ride Home programs through multiple channels, including human resources onboarding, student and employee handbooks, CCSF's website, etc.

Student Campus Safe Escort Program

Although CCSF campus police currently provide an escort service to and from parked vehicles or public transit, seven days a week from 5:30 a.m. to 12:30 a.m., many students may feel their safety concerns are too small to need a police presence. Student-run escort programs encourage a sense of safety as well as foster greater camaraderie among the CCSF community. This program reduces fears (real or perceived) around using transit, bicycling, and walking late at night or by oneself, helping reduce overall dependency on driving.

Recommendation and Path to Implementation

CCSF should consider facilitating a student-run campus safe escort program on Ocean Campus. This may be through extending the existing escort program to allow students to volunteer as escorts, or establishing an online forum or email listserv to help students find others who want to travel together to BART or the parking lot. CCSF could also hire a third-party provider to organize and train student volunteers to act as escorts. Another option is to partner with neighborhood groups that may want to volunteer as escorts.

Case Study

Safe Halo is an on-demand buddy system founded by Rutgers University students in September 2016 that has been expanded to two other schools in Massachusetts and Oregon. Students can text SafeHalo for an escort and be met by two trained students who walk them home or to their destination. Although there are no measureable outcomes yet due to its recent creation, student applications to train as volunteers have outnumbered the capacity to train them all.[30]

Improved Signage and Wayfinding

Signage and wayfinding makes it easy for people to walk or bike between transit and their destinations; dynamic signage may also display expected travel times for those walking and biking to encourage non-driving connections. A robust wayfinding system can reduce barriers to taking transit by complementing physical bike and pedestrian improvements to increase the overall visibility of active transportation modes.

CCSF is centrally located in the Balboa Area; an effective wayfinding signage would include connections between BART and Muni. On campus, signage can direct those who bike or walk to amenities such as bike parking, lockers, and nearby transit stops.

Recommendation and Paths to Implementation

CCSF should establish a wayfinding network that connects Ocean Campus with transit and commercial areas. They should coordinate with

the City and BART to ensure connections are efficient and up to date with latest improvements.

CCSF should seek opportunities to collaborate on wayfinding systems to develop a comprehensive network of signage to direct people to CCSF's Ocean Campus. When design opportunities arise, such as through the Facilities Master Plan, CCSF should consider optimizing pathways to enhance connections between the campus and its surroundings.

Expand on 2016 Travel Behavior Survey

Any TDM program requires an ongoing understanding of travel behavior, demand and needs of diverse population groups. Travel behavior surveys can be part of an overall monitoring plan and can inform the implementation of TDM. They can help identify current patterns, barriers, willingness to change, price sensitivities, travel times, decision factors, and demographics - all of which can support a TDM program tailored to the populations it is designed to serve.

For example, San Francisco State University (SFSU) conducted multiple transportation surveys, which informed their TDM Plan and ultimately supported the Gator Pass (see page 37). In 2016, Nelson\Nygaard, City of San Francisco, and CCSF staff conducted a travel behavior survey on Ocean Campus and online.

Recommendation and Paths to Implementation

A more expansive survey or data collection is fundamental to refining many of the measures in this chapter. Regardless of which measures are implemented, it is recommended that CCSF conduct additional surveys to capture new student and employee need, to reflect current transportation conditions, and to stay up to date with evolving travel behaviors. Such a survey can help identify the TDM measures most appropriate for specific populations and quantify targets. CCSF should work with a consultant to expand on the survey conducted in 2016 and consider precedents such as the SFSU survey.

First/Last-Mile Feasibility Analyses

As travel behaviors, the transportation system, and technology innovate, CCSF may identify new solutions to first and last-mile challenges that make sense. If so, a feasibility analysis can help understand the costs, benefits, trade-offs, and ease of implementing a new solution. Feasibility analyses can help inform budget and resource allocation decisions based on pre-determined goals, measures, and constraints.

Recommendation and Paths to Implementation

First/last-mile solutions include anything from shuttles and vanpools to variations on the escort, senior and incentive programs recommended in this TDM Framework. If a proposed TDM measure required a significant investment, a feasibility analysis could explore alternative scenarios, and the costs and benefits of each. A feasibility analysis would also need to address start-up costs, on-going expenses, and the financial feasibility of each.

Adjust Parking Pricing Program

There is a strong correlation between the price of parking and the rate at which people park. The more the price of parking reflects its true

Wayfinding Best Practices

- Explore and integrate wayfinding into planned campus access design improvements per Ocean Campus Facilities Master Plan.
- Real-time information and dynamic wayfinding signage should be placed at key decision areas and be highly visible.

cost (including land, construction, operations), the more likely drivers with a choice will consider using non-driving modes for all or some of their trips.

Parking policy presents a unique trade-off for CCSF. Subsidized parking is important to many low-income students and staff for whom transit may be impractical; however, ongoing parking subsidies are profoundly regressive, unless comparable or greater subsidies are provided to the least-resourced travelers, including low-income students who may not own cars. If revenue from parking is directed to support the use of other transportation options, adjusting the price of parking can provide more equitable subsidies to those who do not drive.

The proposed Balboa Reservoir and Performing Arts Center projects could significantly reduce Ocean Campus parking supply.[31] If the rate at which people drive to campus does not change, new parking may need to be constructed to accommodate projected growth in the student and employee populations.

The cost of parking can be set to encourage a percentage of the campus population to change the mode they use to reach campus while maintaining parking facilities at 90% capacity.[32] Construction of parking structures in San Francisco typically cost between $20,000 and $50,000 a space; annual operational costs range between $500 and $1,000 per space per year.[33] To cover the cost of building new parking, parking fees would need to be set at about $10-$25 per day, which conflicts with CCSF's educational mission to provide *affordable* access to educational opportunities. Parking fees at that level would also likely reduce demand below the amount necessary to cover the cost of development within a reasonable period.

Currently, CCSF students can purchase an Ocean Campus parking pass for $40 per semester; if the student qualifies for financial aid, the price is $20 per semester. CCSF employees do not pay for parking. At this price, students pay approximately $0.75 an hour, assuming a student spends one and a half hours at the campus twice a week throughout the semester. Without these parking permits, daily parking at the Ocean Campus costs $3 a day.

California Education Code sections 76360-76361 limit the fee amounts that community colleges may require of students for parking services and discounted transit pass programs. However, the Code also allows for some flexibility. Although parking fees may not exceed a $50 per student per semester, fees may exceed these limits if two conditions are met: 1) the full-time equivalent student (FTES)[34] per parking space on the campus exceeds the statewide average FTES per parking space on community college campuses, and 2) the market price per square foot of land adjacent to the campus exceeds the statewide average market price per square foot of land adjacent to community college campuses. Any collected parking fees must be used to manage parking services or subsidize transit use for students and employees.[35]

Recommendation and Paths to Implementation

CCSF should closely monitor occupancy of its parking facilities in response to changes in parking supply. Depending on the results of this parking analysis, CCSF may also consider dynamic pricing, or pricing different areas of its parking supply at different rates; prime parking locations feature higher rates to encourage greater parking turnover and more availability, and less convenient parking is priced at a lower rate.

CCSF should adjust the current parking pricing structure for hourly, daily, and semester on-campus parking, adjusting the prices in relation to one another to avoid overly discounting long-term parking. Students receiving financial aid should continue to pay a reduced price for parking, but in proportion to the adjusted prices. If average parking occupancy exceeds 90%, parking pricing rates should be increased; at 75-90% occupancy, rates should remain the same; and below 75% occupancy, then the rates

should be lowered accordingly. Although parking occupancy data should be collected on at least on a monthly basis, these pricing adjustments should be made on a semester basis in order to capture the larger trend of parking demand.

Following any changes to parking pricing, CCSF should continue to monitor parking demand to evaluate the impact of the set price of parking on the campus parking supply, and adjust pricing accordingly. If the parking demand analysis indicates the need for parking to be priced beyond the amount allowed by Code in order to achieve optimal occupancy and utilization, CCSF should determine whether they meet the conditions set by California Education Code that permits fees to exceed the set limits.

Parking Program Best Practices

- Price parking to achieve a maximum parking occupancy of 90% to ensure there will always be some parking available to students, employees, and visitors.
- Charge for parking only in hourly/daily increments—monthly or semester permits cover up the marginal cost of each trip and indirectly encourage parking longer than actually necessary.
- Costs, rules, and penalties (if applicable) should be publicly stated, easily comprehensible, and clearly visible and available online to inform trip-making decisions.
- Parking fees should be accepted by a variety of payment forms, including credit cards, cash, in person, and online, to facilitate payment for people of all means levels.

Real-Time Parking Information

Providing real-time parking availability information for those who drive increases awareness of a constrained parking supply and allows individuals the opportunity to choose to travel by another mode instead of getting in the car. As a safety measure, notification of where parking is available also reduces search time and excessive circulating (or "cruising") within parking

Case Study

Although California Education Code caps semester parking permits at $50, Santa Monica College charges $85 a semester for parking, and faculty and staff pay $45 per semester. By demonstrating that their FTES per parking space and property values were higher than their respective statewide averages, SMC applied for and was granted a variance to exceed the fee limit for community colleges set by California Education Code.[36] However, parking lots at more distant SMC campus locations are free and are connected to the main campus by a free college shuttle that runs approximately every 20 minutes, as well as Big Blue Bus service. The college also provides students and employees with a robust set of TDM programs to equitably support those who choose to walk, bike, carpool, or take transit.

areas and reduces the potential for vehicle-pedestrian conflicts. Availability information can be displayed on signs outside of the parking garage and can be accessible online through the CCSF website. Showing parking availability and pricing on multiple platforms allows people to choose a non-driving mode to reach campus before getting into their car.

Recommendation and Paths to Implementation

CCSF should install dynamic displays to show real-time parking availability information, and endeavor to make this information available through other channels like the CCSF website or third party mobile applications. This real-time availability information can be derived from the access control of the parking lot, calculated based on the number of entries and exits at any given time. This would require installation of access management mechanisms such as arm-gates to control entries and exits.

Addressing Demand during Peak Registration Periods

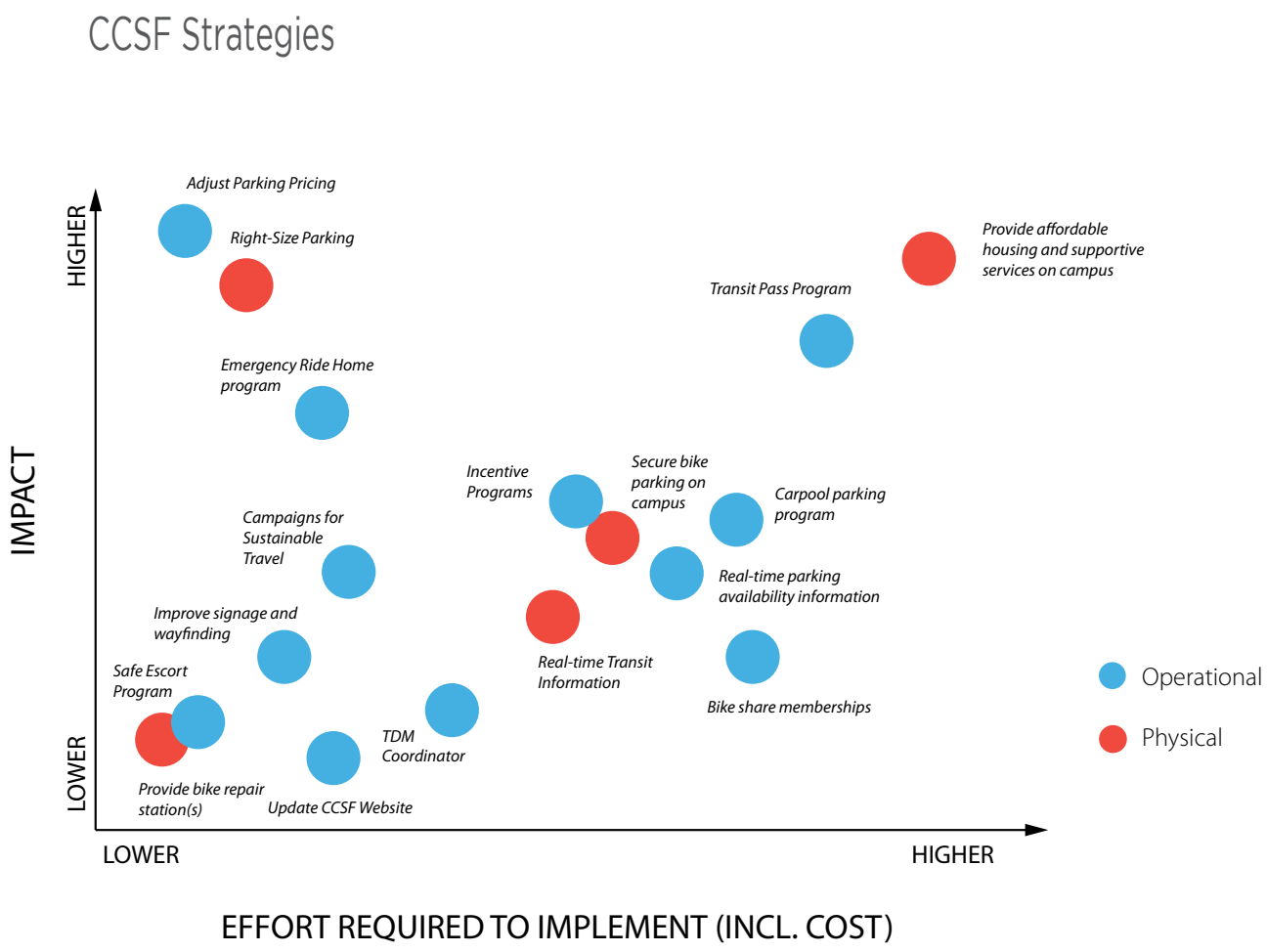
At the beginning of each semester, students shop for classes and generate more trips than other times of year. Prior to and during this time, it may make sense to intensify the application of TDM measures and communications about them. These times are particularly important for marketing the TDM program since students and faculty will be establishing their travel behavior for the term. Registration weeks also present opportunities to consider or pilot additional TDM measures.

Real-Time Parking Best Practices

- Make real-time parking availability information available online or through mobile applications so that individuals considering driving have the option of switching to a different transportation mode in advance.

IMPACT AND COST

The graphic below provides a general order-of-magnitude assessment of the level of investment of each TDM measure on a conceptual level. As discussed in Chapter 1, it is difficult to quantify the impacts of some individual measures on the number of auto trips generated. Since there are several ways to implement these measures, requiring further research, cost refers to a qualitative assessment of both of the financial costs and intangible level of effort required. Detailed cost estimates or quantifiable trip reductions per measure are not included.



MONITORING

The measures discussed in this chapter will best support CCSF's goals, allow CCSF to meet the auto mode share target, and support the City in reducing VMT and GHG emissions. Overall, implementation and monitoring of these measures should follow these principles:

- **Prioritize measures that result in the greatest impact** relative to the required level of effort and cost.

- **Coordinate measures with the CCSF Ocean Campus *Facilities Master Plan***, ensuring that the Facilities Master Plan cites the TDM measures where relevant. The Facilities Master Plan should allow for a range of parking scenarios that support City College's Sustainability goals and equitable access to Ocean Campus, while recognizing TDM's impact on lowering parking demand. Monitoring TDM impacts will allow CCSF to better understand how travel behaviors are changing, the effects of different measures on travel behavior and how TDM measures are meeting the needs of students, employees, and visitors.

Measuring the outcomes of these measures towards meeting the auto mode share cap target–and supporting the overarching goals for the Balboa area–will require monitoring two primary sources of information:

- **Driving mode share**: The travel mode used to get to Ocean Campus can be collected through student and employee surveys or self-reporting tools or platforms. Monitoring travel mode choice will allow CCSF to observe any impacts of these TDM measures on mode shift away from driving toward more sustainable modes. This data can also help CCSF develop a parking strategy that meets the long-term needs of students and faculty.

- **Parking utilization**: Data on parking demand by user type and location should be conducted at least monthly through real-time parking availability or manual data collection. Capturing parking data on a regular basis enables CCSF to evaluate parking prices and the effectiveness of the full package of TDM measures.

CCSF can prepare an annual "TDM Progress Report" that summarizes the transportation program results over the preceding year and highlights intended upcoming changes to support internal progress measurements. These reports will document the progress of the TDM program and help identify areas for adjustment in coming years. In the interest of transparency with the City and the broader community, it is recommended that the reports be posted on CCSF's website for public access within two months of the completion of the data collection.

5

BALBOA RESERVOIR TDM MEASURES

As part of the City's Public Lands for Housing program, the San Francisco Public Utilities Commission's (SFPUC's) Balboa Reservoir property is a proposed site for a mixed-income housing project.

The program's goal is to maximize the amount of affordable housing for low, moderate, and middle-income households on the site.[37] The proposed Balboa Reservoir development would replace a City College of San Francisco (CCSF) student parking lot accessed from Phelan Avenue (Lower Reservoir Lot). The City of San Francisco convened a Community Advisory Committee (CAC) to provide a venue for community input into "Principles and Parameters" and future proposals for developing the site.

San Francisco's transportation demand management (TDM) Program for new development, which requires private developments to select from a menu of TDM measures, applies citywide. As a project with a Development Agreement, the site will need to meet the goals of the TDM Program, but there may be opportunities to incorporate measures that are not included in the TDM Program Menu of Options. This chapter recommends the TDM measures a future developer may consider including in the Balboa Reservoir TDM Plan.

TDM GOALS

While TDM measures are recommended based on their fulfillment of the larger goals of the *TDM Framework* for the Balboa Area, the goals below are specific to the Balboa Reservoir subarea. They were in part derived from the Balboa Reservoir "Principles and Parameters", which include the following principles, parameters, and objectives related to transportation:[38]

- Support and incentivize new residents to make trips by transit, walking, biking, and shared vehicles.
- Lower household transportation costs to support housing affordability.
- Manage parking availability for on-site residents while supporting CCSF enrollment goals and Balboa Area goals related to parking.
- Create safe, accessible, and inviting pedestrian connections between the future Reservoir development and transit.
- Maximize pedestrian and bicycle safety within and around the new development.
- Support CCSF's educational mission and operational needs.
- Maximize peak-hour vehicle trip reductions.

TDM TARGET

The stated goals for the Reservoir site guide the development of the site's policies and metrics. Through the life of the TDM program, these policies and metrics will ultimately gauge the success of the Balboa Reservoir site in minimizing the vehicle trips associated with the proposed development.

As defined in the Request for Proposals from developers, during the first phase of the project, the proposed site will be required not to exceed a 60% auto mode share during weekday peak hours. As the development progresses and through the lifetime of the project, TDM efforts should have an ultimate goal to reduce the auto mode share further.

The future developer of the Balboa Reservoir site should work with the City to determine a long-term auto mode share target for the site. The agreed-upon target should align with the City's long-term goal of achieving an 80% non-drive alone automobile mode share.[39] The baseline vehicle trip estimates may be used to calculate the site's target (e.g., 30% to 50% non-drive alone automobile mode share).

When determining the vehicle mode share target, a penalty structure should also be defined to ensure long-term compliance. The penalty should define a period of time to reach the agreed upon target, a period of program refinement if the target is not met, and a monetary penalty for each six month period that the target continues to go unmet.

PHYSICAL MEASURES

Provide On-Site Affordable Housing

Research has demonstrated the important effects of affordable housing on travel demand. Projects that incorporate affordable housing usually have lower parking demand and vehicle trip generation rates.[40] This typically occurs because there is a lower auto ownership rate among residents in these units. Moreover, there is a high need for affordable housing in the Balboa Area as well as in San Francisco in general. Providing affordable housing may help reduce vehicle miles traveled (VMT) and auto trips and support housing affordability.

Recommendation and Path to Implementation

The Reservoir site developer should consider prioritizing affordable housing for all or most of the development. As CCSF has also identified a need for affordable housing, the developer may consider entering into a partnership with CCSF to provide housing for CCSF students and employees. Further exploration of targeting units in this way would be required.

Affordable Housing Best Practices

- Affordable housing of all types should be encouraged, development should strive to maximize affordable housing beyond the minimum 50% of total housing units for low, moderate and middle income households.[41]
- Sites should have convenient access to transit, bicycle and pedestrian facilities and have clear signage and wayfinding.

Provide On-Site Childcare

Providing childcare services (including after-school programs) at the Reservoir site development would break down a key barrier to taking non-auto modes to work for parents by bringing such services within walking distance and near the many commute options around the Reservoir site.

Recommendation and Path to Implementation

The Reservoir site developer should consider including on-site childcare as part of the development. This may be included on the ground floor of a building. These services could potentially support City College and neighborhood needs as well as Balboa Reservoir residents.

Case Study

Many residential developments in major cities provide childcare services as part of their amenities; NEMA on Market Street provides childcare, and North Beach Place provides day care and children's play areas. By unbundling parking (as per city code), a housing development at 8th and Market Streets freed up space for an on-site childcare center. Parkmerced includes a Montessori School on its premises, with full daycare and after-school care. These sites have not done any analysis as to the trip reduction impacts of providing childcare.

Right-size Parking Supply

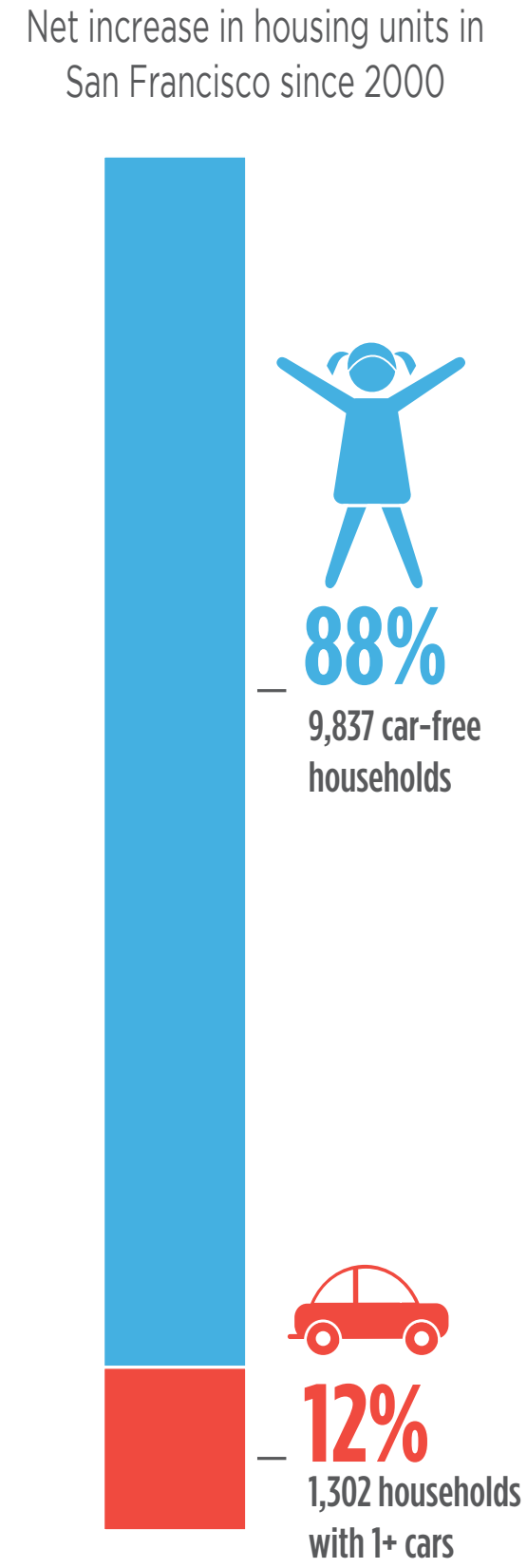
Right-sizing parking means striking a balance between parking supply and demand. Overbuilding parking supply leads to increased automobile use, contributing to more vehicle trips, traffic congestion, higher housing costs,

and greenhouse gas emissions. Reducing the amount of parking required of development provides a financial incentive to developers by allowing them greater freedom to determine how much parking is actually needed for a project. Potentially reducing the amount of parking to be constructed could save approximately $58,000 per parking space.[42] These savings could then be applied to higher quality urban design, affordable housing development, and reducing the overall costs of units. In addition, a development with a lower ratio of parking spaces to units often attracts residents who own fewer or no vehicles, supporting a reduction in driving trips and VMT.

Recommendation and Paths to Implementation

Currently the Balboa Area has approximately 0.98-1.19 parking spaces per unit.[43] Citywide, new residents moving to San Francisco own far fewer cars than existing residents do, with 88% of them being car-free.[44] To reduce the number of vehicle trips generated by the proposed development, it is recommended that in any development solicitation, the City should establish the expectation that no more parking than 0.5 spaces per unit should be provided, and that resources should instead be invested in TDM measures that provide alternatives to driving. Any additional parking provided for non-residential uses should be provided at the lowest possible rates as outlined in the *Planning Code.*

To keep residents of the proposed development from parking on surrounding neighborhood streets, the developer may work with the City to exclude the Reservoir site from the area RPP zone, to ensure that Reservoir residents do not park in adjacent neighborhood streets.



Current day data is based on average of data collected in 2008-2012 by the US Census Bureau ACS, using a 50year average. This is the most recent set of reliable data available from the US Census, 2000 data is from the 2000 US Census

Case Studies

The case studies below demonstrate developments in San Francisco that are near existing transit, include a TDM program and have constructed parking at low ratios. In both cases, despite the lower ratio, on-site residential parking has been underutilized.

Broadway Family Apartments (San Francisco)

Broadway Family Apartments are located in San Francisco, between Telegraph Hill and the waterfront. The development supplies 0.48 spaces per unit, which is 87% utilized. The site is accessible via public transit, including high frequency rail, and is within a short walk to many destinations. The project also provides information about nearby transit options, three car share vehicles, discounted car share memberships, and bicycle parking.

The Mosaica Apartments (San Francisco)

The Mosaica Apartments in the Potrero Hill neighborhood of San Francisco has fewer transportation options available and provides 0.68 spaces per unit, which is 54% utilized. This site does not have many services within a walkable distance and only has two bus lines nearby. The site provides one car share vehicle on-site and bike parking.

Provide On-Site Vehicle Share Spaces

Car share facilities act as both a transportation solution and an attractive building amenity. Car share programs allow for 24/7 on-demand access to a shared fleet of vehicles on an as-needed basis and allow residents and employees to forgo the purchase of a personal vehicle and ultimately reducing the frequency of auto use on a daily basis. San Francisco *Planning Code* requires one care share space for developments with 50 to 200 units and developments with over 200 units need to provide two spaces plus one for every additional 200 units. For non-residential development, one car share space is required per 25 to 49 regular parking spaces; for developments with 50 or more regular parking space, the Code requires car share parking at a rate of 1 for every 50 spaces.[45]

There are two types of car share programs currently in San Francisco: fleet-based (e.g. Zipcar) operators that purchase and maintain a fleet of cars, and peer-to-peer programs that rely on the cars of members for a fleet of available cars (e.g. Getaround). To comply with the City's *Planning Code*, fleet-based spaces must be provided at the above rate. Peer-to-peer vehicles can further increase the availability of shared vehicles; however, these vehicles are not currently eligible for dedicated on-street spaces.

Recommendation and Paths to Implementation

Based on the location of the Balboa Reservoir site and the current shortage of existing car share vehicles in the area, the proposed site should include car share spaces beyond the City requirement. The proposed development should provide free of cost car share parking at a ratio of one car share parking space for every 80 dwelling units, and one car share space for each 20,000 square feet of occupied non-residential space. This recommended ratio is based on best practices and exceeds City code requirements. Under Code, non-residential developments are only required to provide car share spaces if they provide parking.

The developer or property manager should work with local car share operators to locate vehicles on site. If residents of the site have peer-to-peer car share vehicles, the developer could consider providing them with more optimal parking locations, with the agreement that the vehicles are available for sharing for some minimum proportion of the day or week. To further increase the availability of shared vehicles, highly-visible parking locations could be made available for residents when they choose to share their vehicles on a peer-to-peer car share program. However, parking spaces for peer-to-peer car share vehicles would not be provided for free.

Importantly, the use of all car share vehicles should be monitored on an annual basis to determine if more vehicles are necessary, or if the space would be better utilized for shared scooters, bicycle parking, or other TDM purposes. Peer-to-peer vehicles should be monitored on a more frequent basis to ensure that the vehicle is actually being made available for car sharing. As part of the overall monitoring of the future Reservoir Site, this program should maintain flexibility to increase the number of vehicles as development occurs and demand changes.

Shared Spaces Best Practices

- The inclusion of car share spaces should be accompanied by subsidized or discounted car share memberships at a rate of two memberships per unit for each resident's first year of residence.[46]
- Spaces should be located in publicly accessible areas to allow use by non-residents.
- Car share areas should have nearby storage for car seats and other family amenities to reduce the need for private vehicle ownership by households with young children.

Case Studies[47]

- City Carshare members have a ratio of 36 members per car.
- Zipcar members drive 50% fewer vehicle miles than when they had a private vehicle.
- After joining car share programs vehicles per household reduced on average from 0.47 to 0.24 vehicles per household.

Secure On-Site Bicycle Parking

Adequate bicycle parking encourages bicycle ridership by offering riders the same level of access and security as motorists. Convenient bicycle parking is an important element to encourage bicycle parking for short trips, including first- and last-mile connections. The City's *Planning Code* states that residential developments provide both secure and publicly accessible bicycle parking, requiring one bicycle space per unit for the first 100 units and then one bicycle space for every four units.

Recommendation and Paths to Implementation

The Balboa Reservoir site should include secure bicycle parking facilities for residents beyond the minimum requirement stated in the *Planning Code*. The developer should provide bike parking at a ratio of at least one bicycle space per unit.

At the time of construction, the developer should include a secure bike parking area for residents and employees of the site. The space should be equipped with a fob, a key, or another secure access mechanism and should be designed to optimize the use of space for bicycle parking and maintenance. Publicly-available bicycle parking should be placed according to best practices and City code.

Bike Repair Station(s)

Bike repair stations further reduce the barriers to owning and riding a bike by providing tools and amenities. A dedicated space contributes to social acceptance of bicycling and reduces one key barrier associated with owning a bike–concern about complications related to ongoing maintenance–by providing tools and parts in a designated, secure area.

Bike Parking Best Practices

- Bike parking and facilities should be located in easily accessible, well-lit and attractive locations close to main entrances that experience high pedestrian traffic to promote active surveillance.
- Secure bicycle parking should be designed to be as secure as possible (e.g. key access in monitored and closed areas).
- Secure bike locations should located near repair stations, outlets to charge electric bicycles, and large parking areas for cargo and other family or large commuter bicycles.

Recommendation and Path to Implementation

As part of the process of designing bike parking for the Reservoir site, the developer should ensure that adequate space is set aside for installing at least one bike repair station on site. This space should be adequate for a bike stand and the necessary tools and supplies. The tools may be free floating or attached to the bike stand or work bench. Similarly, the supplies (e.g., patch kits, spare tubes, grip tape, etc.) may be provided for free or available for purchase through a vending machine.

Bike Repair Station Best Practices

- The bike repair station should be in a secure area within a building, such as a bike parking room or a building garage.
- Tools and supplies should include, at a minimum, those necessary for fixing a flat tire, adjusting a chain, and performing other basic bicycle maintenance. This may include a bicycle pump, wrenches, a chain tool, lubricants, tire levers, hex keys/Allen wrenches, torx keys, screwdrivers, and spoke wrenches.

Install Real-Time Transportation Information

With multiple transportation options in the area, real-time multi-modal transportation information can facilitate choices and reduce frustrations associated with traveling without a car. Providing residents and visitors of the development with real-time updates on transportation availability in the area decreases the barriers to using non-driving modes and can ultimately encourage residents or visitors to use transit or active modes for short trips. Displaying walking times to and arrival and departure times of nearby transit options enables the development's residents and visitors to better plan transit trips and trip connections. Integrating information about available car share, bikeshare, and other shared vehicles provides a full picture of available options at a given moment. This measure reinforces transit as a reliable transportation option, while also contributing to more realistic wait times, reduced anxiety and frustration using public transit, and an increased sense of general safety.[48]

Recommendation and Paths to Implementation

Properties can display dynamic transit information and transportation marketing in building lobbies or use a similar approach based on technology at the time of occupancy. The developer or property manager may pursue a partnership with an existing company such as TransitScreen©, or develop a similar display independently.

Real-time transportation signage may be provided on site, specifically at elevator bays and in waiting areas; additional signage may be placed outdoors in courtyards or key decision points for people walking to nearby transit facilities. This display should include walking times and routes in addition to transit information and the availability of car share and bike share (when applicable).

Real-Time Transit Information Best Practices

- Screens should be in lobby areas, elevator bays, and in outdoor courtyards, when applicable.
- Screens should include additional information such as transit routes, stop locations, walking and biking travel times, and locations of additional transportation options.

OPERATIONAL MEASURES

Unbundle Parking

While many developments or homes contain "free" parking, the cost to construct and maintain "free" parking is embedded in the cost to buy or rent the unit.[49] Known as "unbundling" parking, the separation of the costs results in lower auto ownership and driving rates.[50] This is because providing parking free of charge or at highly-subsidized rates encourages higher rates of car ownership and use.[51]

Including free parking for residential units also reduces the feasibility of development and makes housing less affordable for those who prefer not to or cannot afford to own a vehicle. Separating the cost of a parking space from the sale or lease of a housing unit saves money for households that do not want parking. When consumers receive the correct price signal for parking, they are more likely to consider moving into a housing unit without a car or a second car, supporting a reduction in driving trips and VMT.

Recommendation and Paths to Implementation

The Balboa Reservoir site developer will be required to unbundle parking for the site, as unbundling parking is part of the *Planning Code* for residential developments citywide.[52] Unbundled parking requires that the developer or property manager lease all accessory parking spaces separately from the rent or sale price of a residential unit. Inclusionary affordable units may also offer unbundled parking when possible; the rental cost of these spaces will be set at a reduced rate that reflects the reduction ratio of rents between affordable and market rate units.[53]

The unbundling of parking spaces in market rate developments should be implemented as follows:

- Spaces should be leased, not sold. Month-to-month leases provide flexibility for residents, and leasing is easier for property owners to manage.

- Leasing rates will be adjusted as needed to manage parking demand. Prices will reflect the daily market rate for parking and be used to restrict demand to available supply, with a minimum rate established that reflects the cost of building parking.

- Spaces may be rented out to non-residents on a monthly basis.

To prevent future residents from parking on neighborhood streets instead of leasing a space on the proposed site, the developer and city should agree that the site may be excluded from a future RPP zone. This information should be provided to all future residents before lease or purchase of a unit.

Unbundle Parking Best Practices

- Apply revenue from unbundled parking to the cost of parking construction and then to other TDM measures, such as the policy measures outlined in the prior section
- Pair unbundled parking with measures that improve the transit, walking, and biking environments surrounding the development
- Base pricing on the market rate cost of parking in the area to deter residents from renting parking at another nearby location
- Couple unbundled parking with an expanded RPP zone on current residential streets nearby to prevent future Reservoir residents who chose to own a car from getting free parking on-street

Shared Parking

Shared parking reduces the total number of spaces required compared to parking allocated to individual uses in stand-alone developments. Throughout the day and across the week, different uses have different peak demands. Reservoir residential parking behavior will likely peak in the early morning (before 5 a.m.) and late-evening (after 10 p.m.) periods when residents are home, whereas CCSF parking behavior peaks between 11 a.m. and 2 p.m. Shared parking agreements benefit the entire Balboa Area community by using the available parking supply efficiently to encourage more walkable places. This has the potential to make housing more affordable, improve traffic flow due to fewer driveways, reduce collisions, reduce emissions from idling vehicles, and support CCSF.

Recommendation and Paths to Implementation

Before proposing parking facilities, the City, CCSF and the future developer of the Reservoir should analyze different parking demand scenarios in which shared parking may help reduce or phase the future parking supply. As parking is constructed on the proposed site, the developer or property manager should monitor the overall use of parking. If not all spaces are rented and the site's parking supply is underused, the developer or property manager should create (or modify) a shared parking agreement that allows the CCSF population or visitors to the area to use unused parking spaces. The spaces included in the agreement should be equipped with signage and re-striping to clearly designate spaces.

The developer should reevaluate the number of spaces included in a shared parking agreement on a regular basis or as residents move in and parking spaces are leased. When these shared parking spaces are occupied, CCSF students and employees may pay for them on an hourly or daily rate within the limits of the shared parking agreement. This price of parking may be different from the price of parking on CCSF's facilities.

Shared Parking Best Practices

- Spaces should be continuously monitored and priced to ensure that the parking demand does not exceed the available parking supply.
- The shared parking agreement needs to provide detailed information of the responsible parties, a map of the parking facility and dedicated shared parking spaces, explicit information about pricing and management, contract/agreement terms and duration, specific liability language, and provision of agreement renewals.
- Revenue generated from share parking spaces should be reinvested into additional TDM measures to strengthen the overall impact of the site's TDM program.
- Shared parking contracts should be agreed to by all participating parties and include coverage for reasonable liabilities that may occur on site.

Provide Car share/Scooter share Memberships to Residents

Car share facilities act as both a transportation solution and an attractive building amenity. These programs allow for 24/7 on-demand access to a shared fleet of vehicles on an as-needed basis and allow residents and employees to forgo the purchase of a personal vehicle.

As another option, electric scooters are highly convenient in a dense urban environment, and complement other programs such as car share and bike share. The main company providing electric scooter share services in San Francisco uses a model that allows users to pick up a scooter in one location and leave it in another. The ability to travel point-to-point, instead of returning scooters to their point of origin, is one of the model's main advantages.

Recommendation and Paths to Implementation

To encourage the use of car share vehicles, the developer or property manager should subsidize at least 50% of the membership costs of car share and/or scooter share vehicles for future residents and/or employees on the site for their first year.

At the time of move-in, each residential unit will receive one membership enabling them to use on-site car share vehicles. If more than one provider exists, residents may be asked to select for which provider they would like a membership. This membership may be renewed annually. If a resident decides to not lease a parking space after moving in, car share memberships may be provided at a rate of one membership per unit after the parking space lease has expired. Residents would be responsible for paying usage costs associated with the car share or scooter share vehicle.

Shared Vehicle Membership Best Practices

- The inclusion of car share and scooter share spaces should be accompanied by subsidized or discounted car share memberships at a rate of two memberships per unit for each resident's first year of residence.[54]

Case Studies[55]

- City Carshare members have a ratio of 36 members per car.
- Zipcar members drive 50% fewer vehicle miles than when they had a private vehicle.
- After joining car share programs vehicles per household reduced on average from 0.47 to 0.24 vehicles per household.

Resident Transit Subsidies

Free or subsidized unlimited transit passes for residents encourage the use of public transportation by reducing the financial barriers to using transit and make it easier for residents to rely on sustainable transportation modes for more trips. Transit subsidies also provide a closer parity between the cost of public transportation and the cost of parking. Especially for residents of affordable units, this measure can improve transit access, equity, mobility options, and further reduce the need for owning a car.

Recommendation and Paths to Implementation

The developer or property manager should distribute Clipper Cards loaded with a transit subsidy at a rate of one card per household at the time of move in. Subsidies can be distributed monthly by distributing or auto-loading cash value to each assigned Clipper Card. The subsidy provided should reflect the cost of a Muni monthly pass and should be adjusted annually for rate increases. Residents of affordable units should receive a subsidy equivalent to the Muni monthly pass that they qualify for based on income and age.

This program should be in place for the life of the project, or until it is determined not to be effective.

First/Last-Mile Feasibility Analyses

As travel behaviors, the transportation system, and technology innovate, the Reservoir developers may identify new solutions to first and last-mile challenges that make sense. If so, a feasibility analysis can help understand the costs, benefits, trade-offs, and ease of implementing a new solution. Feasibility analyses can help inform budget and resource allocation decisions based on pre-determined goals, measures, and constraints.

Recommendation and Paths to Implementation

First/last-mile solutions include anything from shuttles and vanpools to variations on many infrastructure, incentive and safety measures recommended in this TDM Framework. If a proposed TDM measure required a significant investment, a feasibility analysis could explore alternative scenarios, and the costs and benefits of each. A feasibility analysis would also need to address start-up costs, on-going expenses, and the financial feasibility of each.

Transportation Coordinator

A TDM coordinator provides oversight and management of the responsible party's TDM program. This position is responsible for the implementation of TDM measures, serving as a liaison between CCSF and the City, as appropriate.[56] Having a designated transportation coordinator on site creates a point of contact for residents who have transportation-related questions and need tailored transportation information. Additionally, this position would be responsible for updating all transportation information that residents receive about nearby non-driving options; they also may distribute and monitor the effectiveness of all transportation-related benefits.

In addition to implementing the Reservoir site's TDM measures, the transportation coordinator may monitor the use and overall effectiveness of each measures, including tracking the development's trip generation and compliance towards meeting the proposed site's determined vehicle target and TDM requirements.

Recommendation and Paths to Implementation

The developer or property manager may hire an on-site transportation coordinator for the proposed development. The transportation coordinator should have expertise in TDM programs and communications, though the employee could perform other site duties such as facilitating lease agreements and staffing the reception area. This position would work closely with the City to ensure that the proposed development meets all monitoring and reporting requirements set by the City. Depending on the developer, this position may be responsible for coordinating TDM across multiple sites and thus share his/her time accordingly.

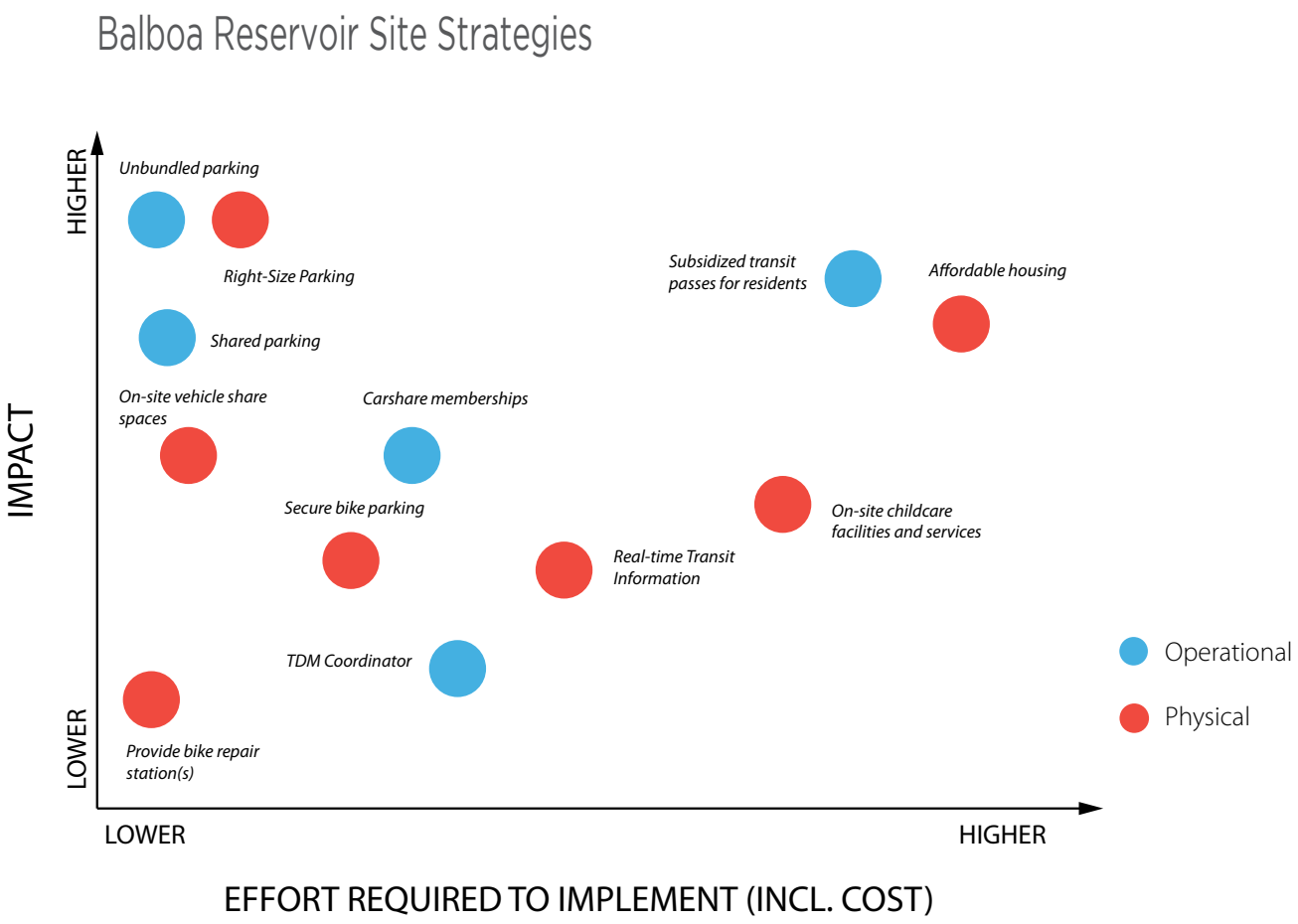
This position will serve as liaison to any transportation-related staff of nearby private developments and the San Francisco Planning Department and other relevant City agencies to ensure updated information is readily available to the Reservoir site tenants and the Balboa Area overall. The coordinator will also facilitate City staff access to the development for data collection and inspection of TDM implementation as necessary, and will be responsible for compiling any associated monitoring reports.

Transportation Coordinator Best Practices

- Position should have an on-site presence.
- Coordinator will actively develop materials and programs to promote non-driving trips.
- Coordinator will facilitate coordinated ordering and promote delivery options to reduce short driving trips.

IMPACT AND COST

The graphic below provides a general order-of-magnitude assessment of the level of investment of each TDM measure on a conceptual level. As discussed in the introduction, it is difficult to quantify the impacts of some individual measures on the number of auto trips generated. Since there are several ways to implement these measures, requiring further research, cost refers to a qualitative assessment of both of the financial costs and intangible level of effort required. Detailed cost estimates or quantifiable trip reductions per measure are not included.



MONITORING

The recommended measures for the Reservoir site enhance access to and attractiveness of non-auto modes, maximize affordability, and support CCSF and City goals. To ensure that the measures laid out in this *TDM Framework* work effectively to support both City and subarea goals, the future developer or property manager should monitor each measure through a variety of data collection approaches, which may include vehicle trip counts, parking occupancy monitoring, and residential transportation behavior surveys.

The monitoring program will be defined in detail in collaboration with the City later as part of the developer agreement. However, it is recommended that the following data points be collected on an annual basis:

- Traffic counts (by all modes) at all entry and exit points to the site during morning and evening peak-hours.
- Sampling counts to determine automobile occupancies and carpool rates.
- Resident and employee travel and TDM surveys to determine travel modes and use of TDM measures.
- Bicycle and pedestrian counts along key facilities or at gateways.
- Parking occupancy for public and private, on- and off-street facilities.

Following analysis of the collected data, the developer or future property manager will prepare an annual "TDM Progress Report" that summarizes the transportation program over the preceding year, intended upcoming changes, and achievement towards the trip reduction targets.

As stated in the beginning of this chapter, the developer or property manager will be responsible for paying a financial penalty, if the agreed upon vehicle target is not met. Though this penalty will be determined in collaboration with the City, it is important that the penalty be cumulative for any period of non-compliance.

6

TDM MEASURES FOR THE BALBOA AREA NEIGHBORHOODS

The Balboa Area has a rich transportation network that provides local and regional access. As stated in Chapter 2, the residential population is expected to grow by approximately 6,200 people, and City College of San Francisco (CCSF) Ocean Campus is expected to grow by 25% over the next decade.

To maintain vehicle access for those who have no other choices for their commutes or other trips, it is important that the transportation options become convenient, accessible, and reliable to encourage more residents and visitors of the Balboa Area to make more trips by modes other than driving alone.

The neighborhood transportation demand management (TDM) measures presented in this chapter aim to reduce the need for drive-alone trips. In addition to reducing vehicle miles traveled (VMT) and auto trips, the TDM measures presented in this chapter support efforts to reduce roadway congestion, improve walkability along key corridors, enhance personal security for those traveling by transit or active modes, and increase the availability of parking for those who need to make driving trips.

TDM GOALS

Although TDM measures are recommended based on their fulfillment of the guiding goals presented in Chapter 1, neighborhood TDM measures also aim to support the following goals based on the Balboa Park Station Area Plan, Citizen Advisory Committee (CAC) input, and comments from community members:

- Reduce traffic congestion on neighborhood streets, particularly major arterials.
- Improve the actual and perceived safety and access for all modes.
- Ensure access to parking for those who need it, particularly residents.
- Support City College's educational mission and operational needs.

Since parking is directly associated with the level of auto trips,[57] TDM measures for the neighborhood seek a balance between reducing auto trips to reduce congestion and providing an appropriate level of parking. Improving actual and perceived safety requires both TDM and complementary physical improvements. Recommended capital improvement measures (e.g., physical network improvements) are discussed in Chapter 6, which aim to modify the public right of way to improve safety and personal security and create space that treats all modes equally.

TDM TARGET

A TDM target for the neighborhood relates to the overall TDM efforts for the Balboa Area as a whole. Because it is difficult to track the travel behavior of every person on every mode, an auto mode share target is recommended for measuring the effects of the neighborhood TDM measures. An auto mode share target expresses the maximum proportion of trips that should be made by vehicles to, from, and within the Balboa Area neighborhood.

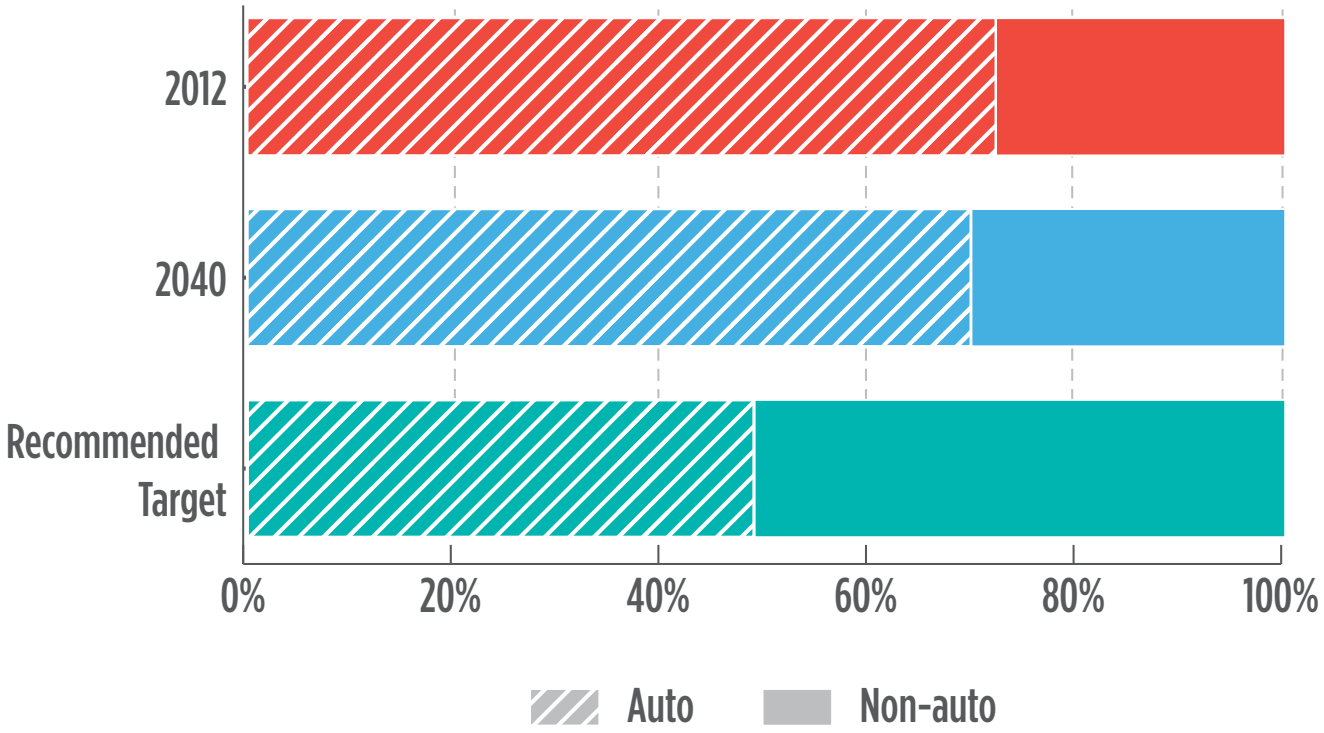
Mode split data for the Balboa Area is provided in the San Francisco County Transportation Authority's (SFCTA) Countywide Travel Demand Forecasting Model ("SF-CHAMP"). This comprehensive model contains current travel behavior information and estimates future travel behavior at the level of transportation analysis zones (TAZs), which vary in size, from single city blocks to multiple blocks, depending on the density of the neighborhood. Travel behavior in SF-CHAMP is calibrated based on observed behavior from the California Household Travel Survey 2010-2012, Census data regarding automobile ownership rates and county-to-county work flows, and observed vehicle counts and transit boardings. The model accounts for a variety of land uses and transportation network characteristics that influence travel behavior (e.g., density and diversity of land uses, number of households, and jobs and socioeconomic attributes). The model also uses transportation networks to calculate the accessibility by mode between origins and destinations, accounting for both travel time and cost.[58]

The model does not anticipate any TDM programs or changes to parking supply or management, nor does it account for any planning efforts in the area (e.g., streetscape and operational changes per the Ocean-Geneva Corridor Design Plan). Changes to either of these could considerably affect future model projections. Current model projections indicate that the auto mode share (drive-alone, carpool, drop-off/pick-up services) will continue to be the dominant mode for those traveling to, from, and within the Balboa Area, representing approximately 65% of the total mode share by 2040 (or a 3% decrease relative to existing conditions). With a modest decrease in auto mode share, model projections indicate a slight increase in transit mode share (from 13% to 19%) and marginal increases in walk and bike mode shares by 2040, respectively.

As new generations of residents, students, and employees travel to and from the Balboa Area, the measures included in this chapter can ensure that more of their trips are by sustainable modes. The targets set for the Balboa Area neighborhoods reflect the City's aspirations, consider the current and projected transportation patterns and investments in the area, and exceed the model projections in order reduce auto traffic congestion and enhance access and mobility.[59] As a whole, the Balboa Area should aim to not exceed a 52% drive mode share. Figure 5 illustrates the current vehicle mode split, the 2040 vehicle mode split, and the recommended vehicle mode split target for the neighborhood.

FIGURE FIVE

Recommended Neighborhood Mode Split Targets



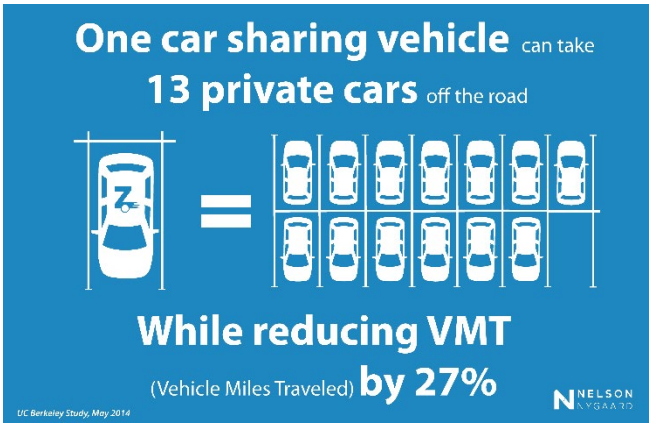
PHYSICAL MEASURES

Expand Car Share Locations and Fleet

Car sharing supports both City and neighborhood goals by reducing vehicle ownership, frequency of auto use, VMT, GHG emissions, and overall parking demand. Additionally, increased access to car share vehicles can improve affordability for nearby residents by reducing the financial burden of owning and maintaining a private vehicle.[60] Car share vehicles are typically accessible to members through a reservation program that is booked in advance. Members pay a monthly or annual fee to gain access to the vehicles and may be required to pay per hour or on a per mile basis.

Car sharing has been effective at reducing private vehicle use and ownership. According to a report by the Mineta Transportation Institute, there are over 30 active car sharing programs in the U.S., with an estimated membership of 378,000 members sharing nearly 10,000 vehicles. The primary attraction of car sharing is the economic and financial incentives for those whom participate in these programs. Essentially, car sharing members do not incur the direct fixed expenses or other costs associated with car ownership (e.g., gas, insurance, etc.). In addition, car sharing households typically rely on modes other than driving—particularly transit—for their primary method of transportation.[61]

A 2010 University of California-Berkeley study that found that between nine and 13 cars are sold or not purchased for each car share vehicle in a fleet. For instance, a 2011 study from City Carshare noted that car share members tend to use other non-auto modes as their primary mode of transportation; more than 65% of survey respondents with car sharing memberships take transit a few times a week or more, compared to approximately 41% of respondents without car sharing memberships.[62] By providing an



opportunity for people to rent a vehicle for a few hours during a given day, access to car share vehicles reduces the need for private vehicle ownership, and is often less expensive than owning a private vehicle.

The Balboa Area generally lacks car share stations and vehicles. The Avalon Building, located at Ocean and Brighton Avenues, includes two Zipcar spaces; there are three Zipcar spaces along Ocean Avenue at Keystone Way and Onondaga Avenue; and two spaces on Gennessee Street just south of Monterrey Boulevard. Compared to other neighborhoods in San Francisco, the Balboa Area is underserved, with approximately five car share vehicles for 5,600 households. The *Planning Code* typically requires a minimum of two car share spaces *per building*, for buildings with fifty units or more.[63]

Recommendation and Paths to Implementation

The San Francisco Municipal Transportation Agency (SFMTA) conducted an on-street car share pilot program. Findings of this program will be presented to the SFMTA Board of Directors in 2017, and may be considered for an operational program. As part of this program, City staff (e.g. San Francisco Planning Department), CCSF, and existing or future developers can request consideration of on-street car share spaces through the SFMTA.[64] The City should leverage the existing on-street car share pilot program to expand car share availability in the Balboa Area neighborhoods.

Through the program, the City can work with car share organizations, the community, and other subareas to identify locations that are easily accessible within the Balboa Area for additional car share vehicles.[65] On-street car share spaces would be assigned by converting existing, publicly available parking spaces. The fleet may continue to expand as demand warrants, with a target ratio of one car share space per 20 households. Providing more car share vehicles will help reduce vehicle ownership for residents, making it easier for those who need to own a car to park. Additionally, it will make it easier for CCSF students and employees to use non drive-alone modes to access CCSF by providing them with access to vehicles for shorter trips that they need to make while in the neighborhood.

For future developments in the Balboa Area, developers and/or property managers can work with certified car share organizations to establish locations in and around their property and serve a new market. However, if this approach is pursued, all vehicles provided by future developments should be accessible by the public and not just to residents of those developments.

Bay Area Bike Share Station Expansion

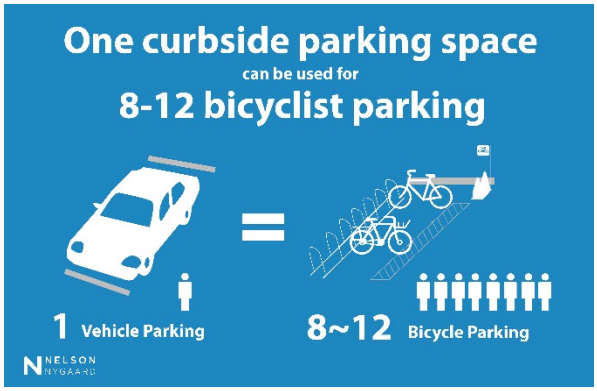
Bay Area Bike Share (BABS) has stations throughout San Francisco and the Bay Area. Future plans include expanding the regional bike share program to the Balboa Park area, including the Balboa Park BART Station, City College and nearby destinations. It is anticipated that there will be one BABS station at the Balboa Park BART station with room for 19 bikes, to be operational by 2018.[66]

Bikeshare at residential developments and commercial destinations can be an attractive building amenity for prospective residents and commercial tenants. A bikeshare program encourages the use of bicycles for short trips and reduces the dependency on vehicle travel and barriers to owning a bicycle.

Recommendation and Paths to Implementation

In an effort to maximize the potential impacts for reduced vehicle trips in the area, the City should consider coordinating with BABS to locate docks in Balboa Area, with specific attention to connections between BART, Ocean, Geneva, Phelan Avenues, Monterey Boulevard, CCSF Ocean Campus, and nearby neighborhoods that are beyond a 5-10 minute walk.

The Balboa Park Station CAC may recommend popular destinations and areas of the public realm with enough space to accommodate new bikeshare stations for the BABS expansion. If demand warrants expansion, a cross-stakeholder effort may be made, ideally through the Balboa Park Station CAC and with the Ocean Avenue Association and CCSF, to explore potential locations for bikeshare stations in the area. This may require re-purposing existing on-street parking spaces. The Balboa Park Station CAC should recommend preferred locations to BABS for future bikeshare stations.



Bike Share Best Practices

- Include promotional assistance and subsidized memberships for neighborhood residents.
- Bikeshare programs have been found to be most successful in areas that have a mix of land uses, higher density, walkable urban form, low vehicle ownership rates, access to basic services and transit, and an on-site parking ratio of less than one space per unit.
- Bikeshare use is most effective when stations are located at key destinations (e.g. transportation hubs and commercial areas) and at a density of one station for every two to three blocks.

OPERATIONAL MEASURES

Expanded on-street parking management

The primary goal of managing street parking is to preserve parking availability for residents by discouraging long-term parking by people who do not live in the area. In the Balboa Area, community members continue to express concerns about drivers attending City College and parking in their neighborhood. Parking management programs are specifically designed for neighborhoods like this, which face high parking demand from other uses (in this case, City College. Without a program that provides preference for residents, it is nearly impossible to prevent non-residents from parking on a public street.

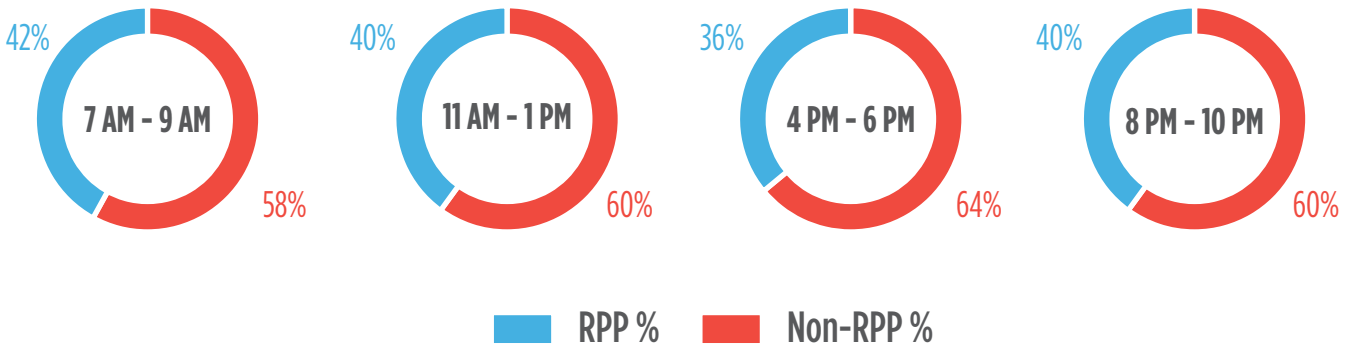
The Residential parking permit (RPP) program in San Francisco is an on-street parking management tool currently used in San Francisco residential neighborhoods. The City's RPP program is available to residents who choose to pursue it. Because not all residents in an area agree with the principle of dedicating public curb space to residences, or want to pay for the program in their area, it is an opt-in program. Past implementation of RPP zones have reduced the incidence of non-resident parking in designated areas. However, as travel behavior has changed in the 40 years since RPP's inception, SFMTA held a series of neighborhood meetings in 2016 to help inform the ongoing Residential Parking Permit Evaluation & Reform Project. The reform project may produce recommendations that are more in line with community concerns. While the existing neighborhood's RPP zones may not be perfect, the concept of managing on-street parking for residents, and tailoring it to Balboa Area neighborhood needs, can still be applied to minimize the impacts of parking demand on residents.

There are two RPP zones in the Balboa Area: RPP Zone D, which is located north of CCSF's Ocean Campus and RPP Zone V, which is largely located south of Ocean Avenue (Figure 6).

Parking permits in these RPP zones are currently $127 annually per vehicle, or $0.35 per day. Vehicles with a parking permit are exempt from time limits for streets within each RPP zone; non-permit holders are subject to two-hour time limits.

FIGURE SIX

Daily Parking Utilization in Balboa Area by RPP and Non-RPP Permit Holders



Recent parking survey data of RPP zones in the Balboa Area indicated that parking occupancies are generally less than 75% occupied throughout the day and evening periods,[67] indicating that parking is relatively available along many neighborhood streets. Furthermore, as illustrated in Figure 6, the majority of cars parked in RPP zones throughout the day did not have permits. It is worth noting that the RPP zone allows two hours of free parking between 8am and 6pm.

Recommendation and Paths to Implementation

Expanding the RPP zones and modifying their hours to suit neighborhood needs can increase convenience and access for existing residents.

Extending RPP time restrictions into evening hours, when demand surges for CCSF classes, will reduce demand for on-street parking and discourage non-permit holders from taking advantage of free, unregulated on-street parking spaces, and can partially encourage those who have a choice to choose other modes of transportation.

It is recommended that RPP zones be extended to cover areas around, but not including, the Balboa Reservoir site, north of CCSF Ocean Campus, and along neighborhood streets in the Ingleside neighborhood (Figure 7). In RPP zones, the regulations may be extended beyond the current 8 AM to 6 PM period to discourage non-permit holders from seeking parking on neighborhood streets. Time restrictions for non-permit holders may also be adjusted from two hours to one hour. Residents should be aware that existing of RPP does not guarantee a parking space.

Expanding RPP zones must be initiated by residents of the Balboa Area, which requires a majority of households on each proposed block to support the change by signing a petition. The petition must also show that the specific proposed blocks are between 80-85% occupied. Parking occupancy should be measured during the hours of greatest demand from non-residents. The signed petition must be submitted to the SFMTA for review, a public hearing, and SFMTA Board approval.[68] While Chapter 3 recognizes community concerns over this process, until there is RPP reform, it is something neighbors may wish to consider.

To reduce the potential for residents of future developments to park vehicles on street, rather than in designated off-street lots, the City should consider restricting new developments—such as the Reservoir site—from participating in existing RPP programs.

Parking Management Best Practices

- Time limits for non-permit holders to park within RPP zones should be consistent throughout the entire zone and not differ between neighborhood streets.

FIGURE SEVEN

Recommended RPP Expansion Zone in Balboa Area

On-Street Parking Pricing and Regulation for Phelan Avenue

The price of parking has been shown to be a highly effective mechanism in changing parking and travel behavior. As fewer people choose to drive and park at their destinations, the overall traffic congestion, VMT, and associated impacts of driving decrease. Demand-responsive pricing involves adjusting the cost of parking according to the level of demand to ensure some parking availability at all times of day.

Phelan Avenue provides direct access to CCSF's Ocean Campus and serves as a main north-south connector between Ocean Avenue and to residences in the Sunnyside neighborhood. Within the Balboa Area, publicly-available on-street parking is provided on both sides of the street, and there are currently no restrictions or metered pricing along the street. Recently collected parking data indicates that parking spaces along Phelan Avenue are nearly always occupied throughout most of the day. These on-street parking spaces are very attractive, as spaces are located closest to the main entryway to CCSF's Ocean Campus. Moreover, these spaces are unregulated, so drivers can park along the street for as long a period as they want with no penalty or consequence.

Recommendation and Paths to Implementation

In order to ensure adequate parking availability along Phelan Avenue, it is recommended that SFMTA install "smart meters" along Phelan Avenue, from Ocean Avenue to Judson Avenue, with pricing set to ensure some availability, per the SFpark program.

This change requires that the SFMTA notice and bring new meters and other parking regulations to a public hearing and to a meeting of the SFMTA Board of Directors, before implementation. In addition, SFMTA should provide adequate notification and signage along Phelan Avenue to notify the public of parking meter installation and when the meters will be active and operational.

Pilot a Senior Ridematching Service

Ridematching is similar to carpooling, in that individuals traveling to the same destination or in the same general direction share a vehicle to reduce the number of drive-alone trips. An increase in carpool trips can further support the overarching Balboa Area goals by reducing traffic congestion, greenhouse gas emissions, and overall vehicle miles traveled (VMT) because of the increase in the number of occupants per vehicle and reducing the number of people driving alone.

The Balboa Area neighborhoods have a greater proportion of residents that are 50 years or older, including seniors. For seniors, mobility and independence are increasingly important, but limitations associated with physical ability and unfamiliarity with new technologies such as smartphone apps are barriers to using a variety of TDM measures. Facilitating residents in the Balboa Area to share rides with one another would not only reduce the number of auto trips but may engender a greater sense of community as well.

Smart Meter Best Practices

- Installation of smart meters without time restrictions to determine parking patterns along on-street spaces and consider time enforcement (e.g., one hour), if deemed necessary to encourage turnover and availability.

Recommendation and Path to Implementation

The City should consider piloting a senior ridematching service with Balboa Area residents. If it is successful, it may be expanded citywide. This service could be developed and administered by the City, or it could be contracted through a third-party provider that specializes in senior transportation services and/or paratransit.

Facilitate Multi-School Coordination

The Balboa Area possesses many other schools of all sizes and levels in addition to CCSF Ocean Campus. School drop-off and pick-up can contribute substantially to traffic congestion, especially if parents are making multiple stops to drop off students, go to work, and run other errands in the area. Coordinating student drop-off/pick-up times, locations, and processes will increase safety for students and drivers in addition to helping reduce VMT and congestion.

Recommendation and Path to Implementation

The City should consider facilitating coordination among the multiple schools in the Balboa Area. This may be done through the San Francisco Safe Routes to School program, which advocates for families and students to use sustainable modes to and from school (Sunnyside and Aptos currently participate in the Safe Routes to School program). This coordination would likely consist of identifying the existing areas for loading and primary circulation routes for vehicles, bicycles, and pedestrians, and discussing among the schools possible opportunities for coordinating schedules and sharing and allocating loading facilities if possible.

Case Study

Formerly the Marin Senior Coordinating Council, Whistlestop provides a variety of services for older adults and people living with disabilities in Marin County. Among their services, Whistlestop provides special needs transportation services including CarePool, which provides free volunteer rides to medical appointments or grocery shopping. Volunteers with CarePool are connected with riders online based on schedule availability. Whistlestop also operates the Safe Transport and Reimbursement (STAR) Program, which supports aging in place and independent living by providing a mileage reimbursement for older adults to give to those willing to be a driver for them. The STAR program does not provide a pool or volunteer drivers, but rather allows the riders to find their own trusted drivers and provide a mileage reimbursement in return for the help they receive.[69]

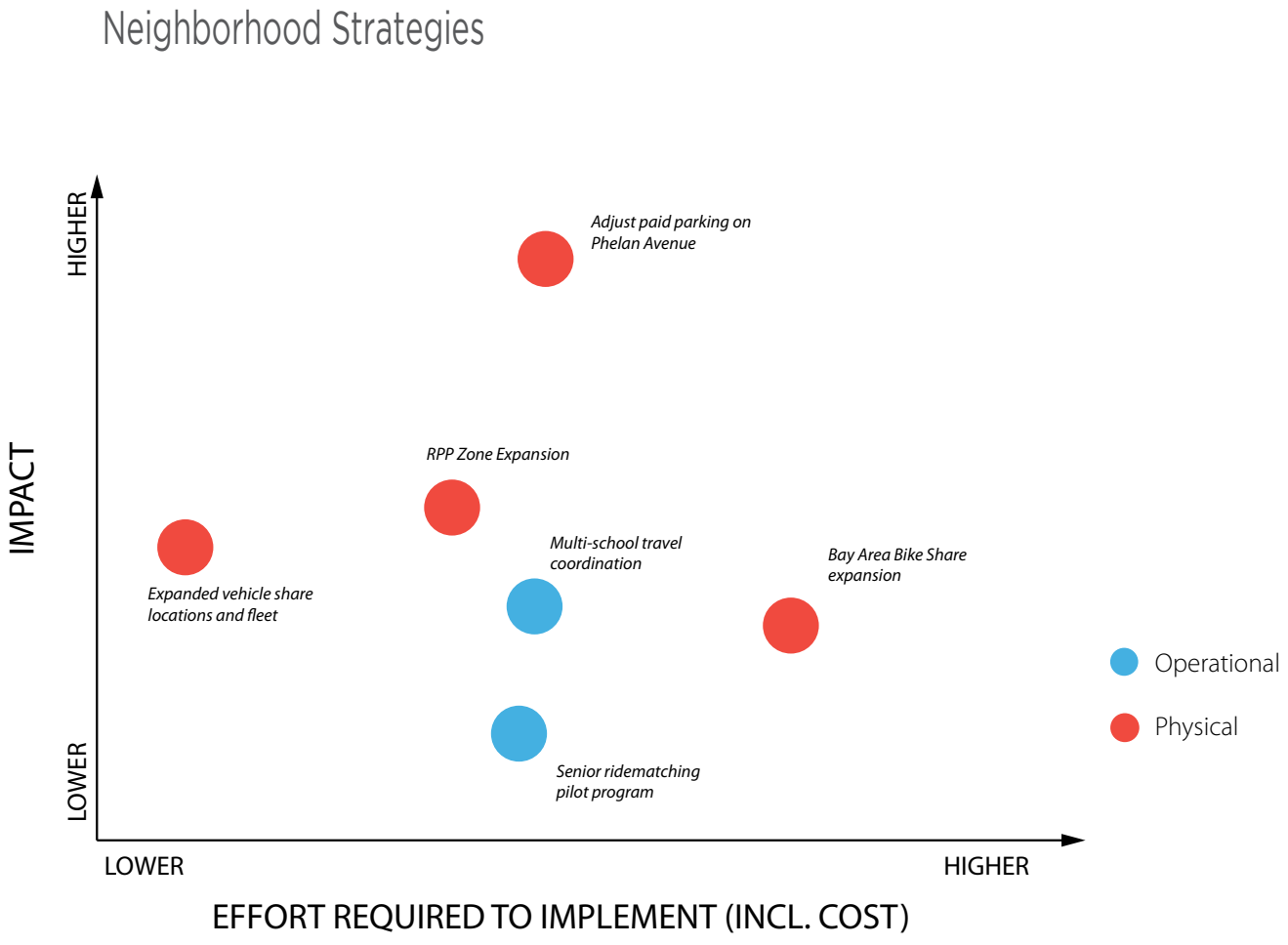
IMPACT AND COST

The graphic below provides a general order-of-magnitude assessment of the level of investment of each TDM measure on a conceptual level. As discussed in the introduction, it is difficult to quantify to impacts of individual measures on the number of auto trips generated. Since there are several ways to implement these measures, requiring further research, cost refers to a more qualitative assessment of both of the financial costs and intangible level of effort required. Detailed cost estimates or quantifiable trip reductions per measure are not included.

MONITORING

As stated, tracking change in people's travel behaviors on a community-scale can be arduous and expensive; however, there are tangible ways to measure the effectiveness of TDM measures for the Balboa Area and to determine if adjustments are required to achieve efficiencies. Monitoring of the community TDM measures will enable the City to determine the effects this *TDM Framework* has on the City goals of reducing VMT, GHG emissions, and preserving housing affordability, in addition to the community goals of making it easier to park, improving safety, and supporting CCSF.

Various City agencies/departments are responsible for regularly collecting information from residents and businesses, these responsible parties include



the San Francisco Planning Department, San Francisco Department of the Environment, and SFMTA—to name a few. It will be up to the discretion of these City agencies/departments to carry out the data collection, monitoring, and reporting efforts. Specific ways for the City to monitor the impacts of TDM in the Balboa Area neighborhoods may include:

- **Community Travel Surveys:** Collecting detailed socioeconomic, household and transportation-related information from Balboa Area residents and workers can provide a wealth of information regarding travel behavior within the community. Coordinating TDM implementation with distribution of travel surveys can help determine the level of influence TDM is having on people's daily transportation choices. Community travel surveys, however, are very costly and time-consuming to complete and evaluate.

- **Vehicle Counts:** Automatic vehicle counters can be placed at neighborhood gateways on Ocean Avenue, Phelan Avenue, Monterey Avenue, and any other streets deemed necessary for evaluation. Vehicle counters count vehicle trips by time of day and enable the city to observe changes over time.

- **Intercept Surveys:** Surveyors can be stationed at key access points and along key corridors in the Balboa Area to intercept people on foot and ask simple questions about affiliation and travel choice. Combined with other count data, intercept surveys are an effective mechanism for calculating mode split changes over time.

- **Quantitative Evaluation along Key Corridors:** Detailed traffic analysis and calculation of vehicle delay can be used to measure auto traffic levels and operation of the street network. Vehicle delay determines the length of time vehicles wait at an intersection. Vehicle intersection counts can be collected at area intersections, and can be analyzed regularly to identify changes in vehicle activity levels. As more vehicle trips are removed from the roadway through effective TDM and related improvements to the network (e.g., increased transit frequencies, additional bike lanes, etc.), vehicle delays may decrease.[70] When assessing vehicle delay, pedestrian, bicycle, and transit activity should also be monitored to determine whether residents and visitors of the area change how they chose to travel to key corridors in the area.

Regular parking counts may also be an effective evaluation tool to determine the shift in vehicle ownership and vehicle travel to the area. As TDM measures are implemented, there may be long-term results of residents foregoing their private vehicles and visitors relying on transit, or other non-driving modes to get to the area. If parking demand reduces, there may be an opportunity for the City to explore new uses for curb space to better accommodate new travel patterns in the neighborhood.

7

BALBOA AREA-WIDE COORDINATION AND FUTURE OPPORTUNITIES

Success of transportation demand management (TDM) in the Balboa Area requires close collaboration between all responsible parties and decision-makers in each subarea (e.g., City, CCSF, developers, and community residents and businesses).

Careful strategic planning and prioritization is required because the actions taken by one party may have implications for another party. For example, changes to the price and supply of parking for any one sub-area – whether on street, at CCSF Ocean Campus, or at the Reservoir site – affects automobile use and congestion for the entire Balboa Area.

Importantly, a level of transparency among the community, CCSF, and the City will ensure a more successful TDM program for the area. Successful TDM will yield a benefit by achieving the stated goals for the overall Balboa Area, with the highest level of benefit for the community. Joint efforts can strengthen the overall effectiveness of the TDM program and ability to enhance access and mobility.

TRANSPORTATION IMPROVEMENTS FOR FUTURE CONSIDERATION

The TDM measures presented in this *TDM Framework* set the stage for how specific physical and operational measures can support and ultimately achieve goals to reducing VMT, single-occupancy auto trips, congestion, and transportation costs. However, such actions do not work in isolation. A functioning, well-connected multi-modal street network and a successful TDM program go hand in hand.

The following section discusses recommended capital improvement measures for future consideration for the Balboa Area—many of which can be implemented within a near-term timeframe. These measures support the ongoing and planned improvements to the area's transportation infrastructure and fully support TDM measures provided in this document. Importantly, implementation of these measures will require a coordinated effort among various City departments, CCSF, and the community.

Bicycle and Pedestrian Access

As the City moves towards achieving a goal of fewer vehicle trips, non-driving infrastructure is increasingly important. Pedestrian access begins with good planning, in particular ensuring connections along desired paths of travel. This should include direct, safe pedestrian connections through the Ocean Campus of City College, for students as well as for residents walking to Balboa Park Station. Equally important for pedestrian access are physical improvements such as wider sidewalks, pedestrian lighting, ADA-standard ramps and curb cuts, traffic calming features, and safer crossings. The latter can include more designated crosswalks, as well as higher visibility through "continental" crosswalk striping, or signal improvements such as a leading pedestrian interval (LPI, or a pedestrian "head start" before vehicles traveling in the same direction).

These improvements help make walking more enjoyable and safe through increased visibility to those traveling by car.

Investing in bicycle facilities can reduce physical barriers to riding a bike and support biking in key areas, such as BART and the Ocean Avenue commercial corridor. For bicyclists, access improvements include closing gaps in the bike network and upgrading existing facilities to provide designated space for those on a bike. Where space permits, these improvements should include buffered, physical barriers to separate bicyclists and vehicles.

Ocean-Geneva Corridor Improvements

As a Vision Zero High Injury Corridor, Ocean and Geneva Avenues are especially in need of improved pedestrian and bicycle safety. The potential first/last-mile connections, safety benefits and transit access provided by the Ocean and Geneva Corridor Design plan would benefit the greatest number and widest range of stakeholders living, working and studying in the area. In particular, the expanded right-of-way option would allow for wider sidewalks and designs to address the needs identified often by community members.

The Ocean and Geneva Corridor Design includes pedestrian, bicycle, and "complete street" design to address these safety and access goals. This TDM Framework recommends that priority be given to the expanded roadway option in the Ocean and Geneva Corridor Design plan, over any new corridor or neighborhood plans.

With concept design and environmental review complete, Ocean and Geneva Corridor improvements require capital funding before moving forward. If improvements are coordinated with planned rail upgrades along Ocean Avenue, the City could use the rail project as a local match for potential regional or federal funds. It is recommended that City and County agencies work with the Board of Supervisors and funding agencies to identify funding for the project.

Lee Avenue Extension

The Balboa Area includes a series of bikeways; however, there are critical gaps in the bicycle network that create barriers to biking in the area. One such gap is near Ocean Avenue, between the Lee Avenue "stub" and the Lee Avenue "extension" in City College's upper reservoir

parking lot. Filling this gap in the short-term would provide a necessary connection between Monterrey Boulevard, surrounding neighborhoods like Sunnyside and Westwood Park, and City College with west-side destinations connected to Holloway Avenue, such as SF State and Parkmerced.

Neighborways

A neighborway can provide greater connectivity between existing bikeways as well as other major destinations, such as BART, Muni, and CCSF Ocean Campus. An effective neighborway would be situated along streets that experience low traffic volumes (fewer than 2,500 vehicles per day), low-speeding vehicles (below 20 miles per hour), controlled intersections (e.g. stop signs, signals), and intersection crossing treatments. A neighborway is not new to San Francisco; the so-called "Wiggle" runs along Market Street to the Haight neighborhood and is a major bicycle route enjoyed by many residents and visitors.

A neighborway linking Ocean Avenue, CCSF's Ocean Campus, and points to the east and west will allow for greater bicycle connectivity in the Balboa Area and create a more enjoyable biking experience in the area for daily commuting and recreational purposes alike. Ensuring a safe bicycle connection on the Lee Avenue extension (to be coordinated with the Reservoir development and City College Facilities Master Plan) and/or on Harold Avenue is a recommended place to start in the Balboa Area. These neighborways would provide a safer alternative for cyclists than traveling through higher-traffic roadways like Ocean Avenue and intersections like the Ocean Avenue/Geneva Avenue/Phelan Avenue intersection.

Intersection Crosswalk Improvements

Below is a list of possible intersections that would benefit from new or re-painted continental ("zebra" style) crosswalk improvements:

- Junipero Serra Freeway/Ocean Avenue
- Phelan Loop/Ocean Avenue
- Phelan Avenue/Judson Avenue
- De Montfort Avenue/Jules Avenue
- De Montfort Avenue/Ashton Avenue
- Westgate Drive/Upland Drive
- Ocean Avenue/Cerritos Avenue
- Ocean Avenue/Cedro Avenue
- Select intersections along Monterrey Boulevard between Ridgewood and Circular Avenue

Other Neighborhood Pedestrian Safety Infrastructure

Below is a list of possible locations that would benefit from additional pedestrian safety and have also been identified in the District Seven participatory budgeting process:

- Pedestrian safety improvements to the intersection of Forrester Street and Judson Avenue (ADA curb ramps, crosswalks, etc.)
- Pedestrian safety and bike safety enhancements to Hearst Avenue at Baden, Congo, Forrester and Gennessee Streets

Transit Stop Improvements

Transit stop improvements can reduce barriers taking transit by making the waiting area more safe, comfortable and reducing perceived waiting times. Given the community feedback on personal safety and security at night, transit stop improvements should include adequate lighting, lines of sight, and safe means of egress. Transit stop improvements may include shelters, benches, signage, and real-time arrival information.

Transit stop improvements may be initiated by the City or included as part of a developer agreement, if transit stops are adjacent to a proposed development. Because transit improvements affect all subareas in this *TDM Framework*, all responsible parties should coordinate planning and external communications very closely between agencies. Real-time transit installation may require working with additional providers.

To determine the appropriate improvements and opportune transit stops, the City may conduct a detailed evaluation of all stops and prioritize improvements are stops with proportionally high ridership. At a minimum, all stops in the area should receive shelters and transit signage to protect passengers from the elements and raise awareness of Muni operations.

Intersection Signal Improvements

The following improvements may be considered by the City to better manage auto traffic flows, reduce potential queues and conflicts with other modes, and enhance roadway connectivity. These improvements will likely need to be considered in tandem with other ongoing transportation improvements for area streets and to further support adequate safety, access, and mobility for all modes.

Ocean Ave/Geneva Avenue/ Phelan Avenue Timing

Optimization of Ocean Avenue/Geneva Avenue/ Phelan Avenue intersection based on planned multi-modal and streetscape improvements presented in the Ocean and Geneva Corridor Design Plan. Since the intersection timing must balance a variety of vehicle, transit and pedestrian movements at the intersection of three major streets, it is recommended to study possibilities to improve the signal timing.

Study Protected Left Turns along Ocean Avenue

Consider protected left-turn phasing along Ocean Avenue intersections to reduce queues for left-turning vehicles and reduce potential conflicts with K-Ingleside trains and pedestrians and bicyclists. In addition, it is recommended to study Ocean Avenue signals for opportunities that may improve K-Ingleside reliability or travel times.

Recommendation and Paths to Implementation

Physical access improvements can vary based on location, but they should work towards the goal of creating more direct, convenient, and comfortable access to the Balboa Park BART Station, Muni bus stops, CCSF, and commercial corridors in the Balboa Area.

The capital improvements measures represent individual projects that will require coordination among various City departments, CCSF, CAC members, residents, and business owners. Prioritization of area-wide improvements presented in this chapter, identifying how they support current planning efforts and how they complement TDM measures for all subareas, in the Balboa Area will need to be considered.

Ongoing Coordination

As noted among the community concerns in chapter 3, strong coordination between implementing agencies and clear communication with the public will be essential to efficient project delivery and to minimizing construction impacts on the neighborhood. While many projects are still in planning, as they approach implementation, construction scheduling should take into account the staging and scheduling of other projects in the neighborhood.

CONCLUSION

The *Balboa Area TDM Framework* is designed to encourage collaboration among various groups and provide an understanding of how transportation demand can be effectively managed for residents, students and employees in the area. This document is a supportive resource for the community, City, and CCSF's shared goals of reducing VMT, reducing auto trips, limiting traffic congestion, and lowering household transportation costs to manage affordability.

The *TDM Framework* document illustrates how TDM measures can be tailored to specific target populations and how they can complement one another. The TDM measures presented in this *TDM Framework* will reduce VMT, auto trips, traffic congestion, and transportation costs to targeted populations. However, these measures will have an even greater impact on travel behavior if they are implemented concurrently with other capital improvements. They rely on a transparent, coordinated effort among each sub-area.

TDM is not meant to restrict anyone from driving or owning a car. The intention of TDM is to reduce the need to drive or own a car, by providing transportation and mobility choices. Simply shifting 10% of auto demand from private cars to other modes can have a considerable effect on traffic congestion in the Balboa Area, improving mobility for people traveling by all modes, including by car. The TDM measures presented in this *TDM Framework* open up opportunities to not only reduce congestion and VMT, but also to partake in healthier lifestyles and a more enjoyable transportation experience.

The Balboa Area is changing and will continue to evolve; the transportation challenges facing the community today will continue until the City, CCSF, and the community together take strategic and proactive measures. Implementation of these TDM measures will set the course in that direction; allowing for a reduction in traffic congestion (by creating modal shifts away from auto use) and enabling new development to be built with limited new traffic. The measures in this *TDM Framework* document provide a path forward for key decision-makers to consider in achieving the sustainability goals for current and future residents, businesses, visitors, and CCSF students and employees of the Balboa Area.

NEXT STEPS

This TDM Framework is the beginning of an iterative process of land use planning, transportation planning, implementation and ongoing monitoring of TDM measures in the Balboa Area.

Chapter 2 notes the many City and City College policies already set TDM-related goals and targets. The recommendations in this document represent several ways to achieve those targets. Some operational measures can be implemented in the short-term (e.g. website and communications). And the operational and physical TDM measures should be taken into account as planning continues for the Ocean Campus and the Reservoir Development.

Since the recommended TDM measures are based on conceptual land use and populations, more details will be needed before CCSF and the Reservoir development refine TDM measures into comprehensive, measurable and implementable plans. This Framework provides a common foundation for these plans, and is the first step to ensuring they support and align with each other.

Endnotes

[1]SFMTA Travel Decision Survey 2015 – Key Findings, https://www.sfmta.com/sites/default/files/reports/2016/2015%20TDS-Key%20Findings_Accessible-WEBPAGE.pdf.

[2]Urban Land Institute, Bay Area in 2015: A Survey of Views on Housing, Transportation, and Community in the Greater San Francisco Bay Area, http://sf.uli.org/wp-content/uploads/sites/47/2011/05/Bay-Area-in-2015-final.pdf.

[3]Balboa Area TDM Framework – Existing Conditions Report (October 2016) available online at: http://default.sfplanning.org/plans-and-programs/planning-for-the-city/public-sites/balboareservoir/Nelson_Nygaard_Balboa_TDM-Existing_Conditions_Memo.pdf.

[4]VMT is a measure of the amount and distance traveled by a given vehicle, taking into account the number of passengers within a vehicle. It is increasingly accepted as a more accurate measure of local and regional impacts associated with new development and other projects.

[5]Vehicle roadway volume estimates provided in San Francisco County Transportation Authority's (SFCTA) SF-CHAMP model for Year 2012 and Year 2040.

[6]Ibid.

[7]Balboa Park BART Station Modernization Phase 2 Eastside Project from http://www.bart.gov/about/projects/balboa

[8]Balboa Park Station Area and Plaza Improvements. (2016). SFMTA. Retrieved 28 June 2016, from https://www.sfmta.com/projects-planning/projects/balboa-park-station-area-and-plaza-improvements.

[9]San Francisco Bicycle Plan. SFMTA, June 2009. https://www.sfmta.com/sites/default/files/projects/San_Francisco_Bicycle_Plan_June_26_2009_002.pdf. Ocean and Geneva Corridor Design Final Report. City of San Francisco Planning Department. March 2015. <http://sf-planning.org/ocean-avenue-corridor-design>

[10]SFMTA, Muni Forward. https://www.sfmta.com/projects-planning/projects/muni-forward-0.

[11]American Community Survey data, 2011-2015.

[12]Based on SFCTA SF-CHAMP Model, 2016.

[13]Plan Bay Area available online at: http://planbayarea.org/plan-bay-area.html.

[14]CCSF 2015-2016 annual student headcount, CCSF website. 2016 CCSF Ocean Campus graded enrollment, provided by Sandis.

[15]Fall 2015 CCSF Student Attendance Memorandum. CCSF email survey, May 2016; Nelson\Nygaard intercept survey, May 2016.

[16]CCSF Fall 2015 Ocean Campus Attendance Memorandum. "Morning" is defined as before noon, and "evening" is defined as after 4:30 p.m.

[17]The median construction cost per square foot of surface parking in the San Francisco area is approximately $70, which amounts to around $24,500 per parking space (Carl Walker, http://www.carlwalker.com/wp-content/uploads/2016/06/2016-Carl-Walker-Cost-Article.pdf). Costs escalate rapidly with the complexity of the parking facility, with above-ground parking around $100-$120 per square foot (up to $45,000 per space) and underground parking around $120-$165 per square foot (up to $58,000 per space) (Rider Levett Bucknall, http://assets.rlb.com/production/2016/04/20002334/RLB-Riders-Digest-USA-2016.pdf).

[18]Victoria Transport Policy Institute, TDM Encyclopedia, Updated May 2015. http://www.vtpi.org/tdm/tdm85.htm.

[19]TransForm, GreenTRIP Parking Database http://database.greentrip.org/ Assembly Bill 744, which was approved on October 9, 2015, recognizes the lower parking demand and VMT associated with affordable housing developments. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB744.

[20]California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010.

[21]Kari Edison Watkins and Candace Brakewood, "Research Pays Off: Assessing the Impacts of Real-Time Transit Information." TR News, Transportation Research Board, June 2016. http://onlinepubs.trb.org/onlinepubs/trnews/trnews303rpo.pdf

[22]San Francisco Municipal Transportation Agency, Standards for the Transportation Demand Management Program, Updated February 2017.

[23]California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010.

[24]Cal. Educ. Code §76360 and §76361 (Amended by Stats. 2005, Ch. 654, Sec. 14); available online at: http://codes.findlaw.com/ca/education-code/

[25]San Francisco State University 2016 Transportation Survey Results Final Report, Nelson\Nygaard, October 2016.

[26]Santa Monica College 2016 Transportation Survey findings, provided by Santa Monica College Office of Institutional Research.

[27]Personal communication (via email) from Tim Chan, BART Manager of Planning, dated February 7, 2017.

[28]Phone call with Laura Ruchinskas, Motivate, June 2016.

[29]San Francisco Emergency Ride Home Program Rules. https://sfenvironment.org/sites/default/files/fliers/files/sfe_tr_erh_program_rules_guide.pdf

[30]Safe Halo website, https://www.wearesafehalo.com/.

[31]The components of the Balboa Reservoir development are not determined at this time.

[32]Practical capacity is defined as a balance point between supply and demand. Practical capacity of 90% is common for off-street parking facilities, which allows for adequate use of spaces and allows for adequate supply to be available during peak periods while reducing excessive vehicle circulation from drivers searching for parking.

[33]See footnote 17.

[34]FTE is a technical term in education policy that relates to how many students taking full study loads would generate a number of measured or anticipated student credit hours. This is often used to estimate instructional workload for state budgeting, or to calculate the exact equivalent of measured student credit hours in a given period for local resource allocation.

[35]Cal. Educ. Code §76360 and §76361 (Amended by Stats. 2005, Ch. 654, Sec. 14); available online at: http://codes.findlaw.com/ca/education-code/

[36]Phone conversation with Ferris Kawar, Santa Monica College Sustainability Project Manager, January 2017.

[37]At the time of publication, three developer groups that responded to the RFP were selected and will undergo review by various City departments and community groups. Selection of a developer is to occur mid-2017; more information is available online at: http://sf-planning.org/balboa-reservoir.

[38]San Francisco Planning Department, Revised Transportation Development Parameters, December 2015.

[39]San Francisco Department of the Environment, San Francisco Climate Action Strategy 2013 Update, pg. vii.

[40]TransForm, GreenTRIP Parking Database http://database.greentrip.org/ Assembly Bill 744, which was approved on October 9, 2015, recognizes the lower parking demand and VMT associated with affordable housing developments. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB744.

[41]For further affordable housing goals at the Balboa Reservoir site, see http://sfwater.org/balboa .

[42]The median construction cost per square foot of surface parking in the San Francisco area is approximately $70, which amounts to around $24,500 per parking space (Carl Walker, http://www.carlwalker.com/wp-content/uploads/2016/06/2016-Carl-Walker-Cost-Article.pdf). Costs escalate rapidly with the complexity of the parking facility, with above-ground parking around $100-$120 per square foot (up to $45,000 per space) and underground parking around $120-$165 per square foot (up to $58,000 per space) (Rider Levett Bucknall, http://assets.rlb.com/production/2016/04/20002334/RLB-Riders-Digest-USA-2016.pdf).

[43]San Francisco Transportation Demand Management Tool, http://www.sftdmtool.org/

[44]American Community Survey, 2012.

[45]San Francisco Planning Code Article 1.5 Sec. 166. http://library.amlegal.com/nxt/gateway.dll/California/planning/article15off-streetparkingandloading?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$anc=JD_Table166

[46]GreenTRIP Traffic Reduction Strategies – Free Car share Membership, GreenTrip Connect Car Share Factsheet.

[47]All case study information sourced from GreenTrip. See footnote 8

[48]Kari Edison Watkins and Candace Brakewood, "Research Pays Off: Assessing the Impacts of Real-Time Transit Information." TR News, Transportation Research Board, June 2016. http://onlinepubs.trb.org/onlinepubs/trnews/trnews303rpo.pdf

[49]See footnote 5 on the cost of constructing parking.

[50]Fehr & Peers, Parking Analysis and Methodology Memo, SF13-0666.02, April 2015.

[51]See footnote 12.

[52]Section 167 of the San Francisco Planning Code.

[53]Rental rates for unbundled parking in affordable housing developments will be governed by the regulations imposed by financing sources, including those imposed by the California Tax Credit Allocation Committee.

[54]GreenTRIP Traffic Reduction Strategies – Free Car share Membership.

[55]All case study information sourced from GreenTrip. See footnote 8.

[56]San Francisco Municipal Transportation Agency, Standards for the Transportation Demand Management Program, Updated February 2017.

[57]McCahill et al, "Effects of Parking Provision on Automobile Use in Cities: Inferring Causality," 2016.

[58]Schwartz, Michael and Drew Cooper, SFCTA. Quantification of Impacts under CEQA following New Guidelines from the Governor's Office of Planning and Research Memorandum (February 25, 2016).

[59]The San Francisco Department of the Environment's Climate Action Strategy 2013 Update (October 2013), has a goal to achieve an 80% non-private automobile mode split by 2030.

[60]SFMTA, Car Sharing Policy and Pilot Project, July 2013, https://www.sfmta.com/sites/default/files/projects/SFMTA%20Car%20Sharing%20Policy_MTAB_20130716.pdf.

[61]Mineta Transportation Institute, Greenhouse Gas Emission Impacts of Car sharing in North America, MTI Report 09-11, June 2010.

[62]Martin, Shaheen, Lidicker, The Impact of Car sharing on Household Vehicle Holdings: Results from a North American Shared-Use Vehicle Survey, 2010.

[63]Planning Code Section 166. Car Sharing.

[64]SFMTA, On-Street Cat Share Pilot Program, https://www.sfmta.com/projects-planning/projects/street-car-share-pilot.

[65]SFMTA is currently partnering with private car share companies to develop a pilot program to establish on-street car share parking standards.

[66]See footnotes 26 and 27.

[67]See Balboa Area TDM Existing Conditions Report, San Francisco Planning, 2016. This parking survey data was collected on November 3, 2016.

[68]SFMTA, Request Permit Area Expansion, https://www.sfmta.com/services/permits-citations/parking-permits/residential-area-permits/request-permit-area-expansion.

[69]More information on Marin County's Whistlestop program is available online at: http://www.whistlestop.org/transportation.

[70]As vehicle trips are removed from the network, vehicle delays will likely decrease. However, as more space opens up on the roadway network, it's also likely that additional cars will rise to fill this temporary capacity, returning to—or sometimes exceeding—the earlier levels of congestion. This phenomenon is called induced demand, and is most frequently cited here: Duranton, Gilles, and Matthew A. Turner. "The fundamental law of road congestion: Evidence from US cities." The American Economic Review 101.6 (2011): 2616-2652. http://www.nber.org/papers/w15376

[this page intentionally blank]