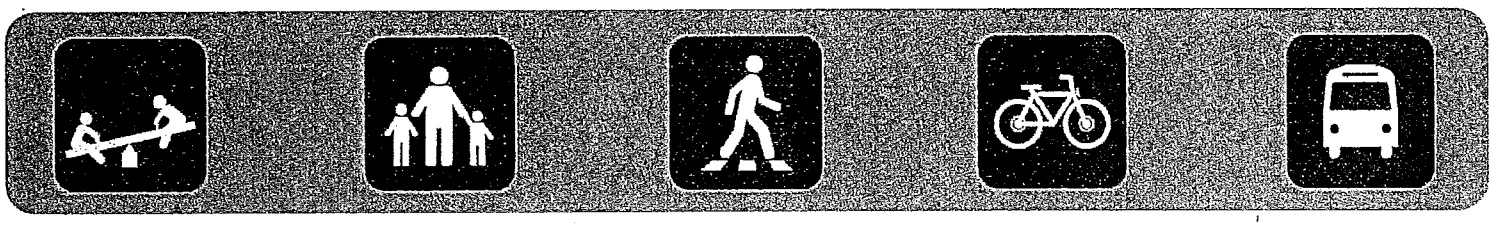
San Francisco Infrastructure Level of Service Analysis

March 2014



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List of Acronyms

AB	Assembly Bill
BSP	San Francisco Better Streets Plan (2010)
CPAC	Childcare Planning and Advisory Council
DPH	Department of Public Health
DPW	Department of Public Works
FCCH	Family license care home
LOS	Level(s) of service
Muni	San Francisco Municipal Railway
NRPA	National Recreation and Park Association
OECE	Office of Early Care and Education
PEQI	Pedestrian Environmental Quality Index
PFA	Preschool for All
ROSE	Recreation and Open Space Element
RPD	San Francisco Recreation and Parks Department
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SFUSD	San Francisco Unified School District

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1. EXECUTIVE SUMMARY

CAPITAL IMPROVEMENT PROGRAM PRIORITIZATION

Recognizing the critical role infrastructure plays in creating a thriving economy and vibrant communities, the City of San Francisco Planning Department and the Capital Planning Program commissioned this study to continue the City's efforts to strategically address its infrastructure needs. In recent years the City has moved forward on a number of initiatives to strengthen its capital planning process, including establishing the Capital Planning Program and creating the City's first 10-Year Capital Plan in 2006. The Capital Plan is a fiscally-constrained, long-range plan that draws on existing planning documents, such as the City's General Plan and Neighborhood Area Plans, to guide policy and funding decisions related to infrastructure investments. The Plan is updated and approved by the Capital Planning Committee, the Board of Supervisors, and the Mayor every other year.

This study supports these efforts by quantifying the current level of infrastructure services within the city and by developing target levels for those services based on agency directives. The study also recognizes the City has limited resources to fund and maintain infrastructure, and needs to set realistic infrastructure provision goals. The results of this report are intended to help inform the City's capital planning process and future infrastructure decisions. As part of this process, the following five infrastructure categories have been reviewed:

1. Recreation and open space;
2. Childcare;
3. Streetscape and pedestrian infrastructure;
4. Bicycle infrastructure; and
5. Transit infrastructure.

For each of these categories, this study evaluates (1) the existing level of service (LOS), (2) an aspirational, long-term LOS standard, and (3) a realistic, short-term (2030[1]) LOS standard. Each of these LOS is described in greater detail below.

PROJECT OBJECTIVES

The infrastructure LOS review and analysis study has four clear objectives:

- To evaluate existing levels of infrastructure provision and distribution throughout the city;

[1] In most cases the timeframe of analysis is from the current year (2013) until 2030. Two exceptions are bicycle infrastructure and childcare, for which the timeframe of analysis extends until 2020. This selection of a shorter timeframe for these two infrastructure categories is discussed in more detail in the relevant infrastructure chapter.

- To recommend aspirational and attainable LOS targets for the city considering fiscal, policy, physical, and social constraints;
- To use existing LOS provisions along with the developed LOS standards as a tool to understand potential opportunities for capital investment; and
- To provide guidelines for evaluating capital projects in terms of citywide standards.

STANDARDS-BASED METRICS

The LOS metrics developed and evaluated in this study are, where possible, standards-based metrics. Standards-based metrics are LOS metrics that measure infrastructure provision against some measure of population – typically either population (residents) or service population.[2] An example of a standard-based metric would be: 2 miles of street per 1,000 residents. The LOS metrics for recreation and open space, pedestrian and streetscape infrastructure, and childcare were all developed as standards-based metrics.

The benefits of using standard-based metrics include being able to:

- Set clear City targets for infrastructure provision and capital planning;
- Measure infrastructure distribution across the city's neighborhoods, thereby identifying areas of need;
- Allow infrastructure provisions to be benchmarked against past/future provision;
- Inform future planning and large-scale redevelopment decisions;
- Develop a common language and tool for agency policies and various infrastructure types;
- Measure and track the City's infrastructure provision in relation to other comparable cities;
- Provide a visual tool to help prioritize capital investment; and
- Streamline the development impact fee nexus update process.

Given constraints associated with some infrastructure categories, not all metrics within this study are standards-based. Bicycle infrastructure and transit infrastructure metrics are both structured in alternate ways, relying on different measures of provision that are not directly correlated to population or service population. These two infrastructure categories take into account future capital needs and assign a share of those needs to development.

DEVELOPMENT PROCESS

Metrics were developed based on existing City policies, department consultation, and an overview of best practices from comparable cities throughout North America.[3] The key finding from the best practices review is that, while infrastructure metrics – particularly standards-based metrics – are rare among built-out cities, most

[2] Service population is a unit of measure that encompasses all local infrastructure users, including residents and employees. Residents are assigned one point, while employees are typically assigned 0.5 points to reflect their lower level of usage. For recreation and open space, service population is calculated by assigning residents one point, and employees 0.19 points. Refer to the companion report, *San Francisco Citywide Nexus Analysis* (March 2014), and its appendix report, *San Francisco Citywide Nexus Analysis – Service Population Concept Memorandum* (September 24, 2013) for more detail.

[3] Please see the Appendix – Citywide and Neighborhood Policy Documents for a list of policies and reports that were researched in the evaluation. Also, the Appendix – Case Study Tables provides an evaluation of infrastructure provision of San Francisco compared to cities surveyed.

cities surveyed expressed significant interest in developing such metrics as a way to simplify and standardize provision measurement and distribution.[4]

To develop LOS targets, the first step was to determine quantitative metrics for each infrastructure type. The current provision, using this quantitative metric, was mapped to understand distribution across neighborhoods. Next, the long-term aspirational goals were identified based on policy research and department input. The long-term goals reflect policy goals that may become achievable over the long-term under alternate financing and social landscapes – i.e. given fewer constraints, financial and otherwise. After quantifying these two conditions, the current LOS and the long-term aspirational goal, short-term targets were developed to reflect infrastructure development objectives that are more feasible given fiscal and social constraints. The short-term (2030 – or 2020, in the case of childcare and bicycle infrastructure) targets were developed in consultation with responsible departments, and reflect a reasonable estimate of what the City intends to achieve based on prevailing fiscal conditions in San Francisco for both capital and operations and maintenance costs. In some instances, the short-term targets reflect a preservation of the current LOS (childcare, recreation and open space), while for other infrastructure categories, the short-term targets reflect reasonable development plans (bicycle infrastructure, streetscape and pedestrian infrastructure).

In addition to supporting capital planning efforts, the short-term targets help inform future development impact fees: feasible short-term targets help set reasonable fee levels. By contrast, basing development impact fees on the ambitious infrastructure provision of the long-term aspirational goals would create an undue burden on new development that the City is unable to match.

Finally, it is important to note that these goals and targets do not preordain funding to specific locations but rather set up a systematic approach to help understand locations of potential infrastructure investment and determine potentially appropriate infrastructure projects to consider. Individual projects will be guided by a number of other factors including departmental guidance, community support, fiscal feasibility, and so on.

FINDINGS

Table 1 summarizes the current LOS provision, the long-term aspirational LOS goals, and the short-term LOS targets for the five infrastructure categories. The LOS targets developed as part of this work are consistent with current City plans and are intended to be applied as guidelines. The City may choose to aspire to higher goals or lower targets to account for unique neighborhood characteristics and/or available resources for investing in and maintaining new infrastructure. A list of guiding policy documents that were used to develop the LOS metrics presented in this report are summarized in Table 2.

Because few cities have well-defined LOS targets, it can be difficult to compare San Francisco's performance against comparable cities. However, where it is possible to do so, San Francisco is clearly on par or better in terms of infrastructure provision. For recreation and open space, San Francisco, by various measures, provides 1.6 to 3.5 *more* acres of park per 1,000 residents than New York City. San Francisco also performs well in park provision in terms of access. Almost all residents in San Francisco live within a half mile of a park or recreation facility.

In addition to comparing well against other cities, San Francisco has also done a good job of meeting the provision goals it sets for itself. For bicycle infrastructure, the city has also completed all bicycle lane

[4] Many California cities that continue to expand into greenfield /undeveloped areas have infrastructure level of services standards in their general plans to inform privately developed master plans, as well as to set a development fee program that may be above their existing citywide provision.

improvements put forth in *the 2009 Bicycle Master Plan*. Such commitment to targets has helped San Francisco maintain its high levels of infrastructure provision and service.

NEXT STEPS / RECOMMENDATIONS FOR FURTHER STUDY

There are numerous possible ways to measure the provision of a given infrastructure type. The proposed metrics for each infrastructure type are constrained by the availability of data for each infrastructure type and by the availability of a clear understanding of costs associated with expanding capacity. Each section recommends additional data that could further refine and enhance the utility of these metrics.

Table 1. Summary of LOS Metrics for Five Infrastructure Categories

Facility Type	LOS Metric	Current Citywide Average	Long-term Aspiration	Short-term Target	Projected Citywide Shortfall [1]
	Recreation and Open Space	**LOS**	**LOS**	**LOS**	**2030**
1	Acres of City-Owned Open Space / 1,000 Service Population Units	4.0	4.0	4.0	566 acres
1.1	*Acres of Open Space / 1,000 SPU*		*3.5*	*3.5*	*55 acres*
1.2	*Acres of Improved Open Space / 1,000 SPU*		*0.5*	*0.5*	*511 acres*
2	Acres / 1,000 Adjacent Residents	0.7	0.5	0.5	N/A
	Childcare	**LOS**	**LOS**	**LOS**	**2020**
1	% of Infant and Toddler (0-2) Childcare Demand Served by Available Licensed Slots	37%	100%	37%	2,529 spaces
2	% of Preschool Age Children (3-5) Childcare Demand Served by Available Licensed Slots	99.6%	100%	99.6%	2,256 spaces
	Streetscape and Pedestrian Infrastructure	**LOS**	**LOS**	**LOS**	**2030**
1	Square feet of sidewalk / improved sidewalk space per service population unit (SPU)	103 square feet of sidewalk / SPU	88 square feet of *improved* sidewalk / SPU	88 square feet of *improved* sidewalk / SPU	N/A
	Bicycle Infrastructure	**Infrastructure**	**Infrastructure**	**Infrastructure**	**2020**
1	Number of Premium (LTS 1, 2) Network Miles	51 miles	251 miles, 100%	61 miles	10 miles
2	Number of Upgraded Intersections	3 intersections	203 intersections	13 intersections	10 intersections
3	Number of Bicycle Parking Spaces	8,800 spaces	58,000 spaces	12,800 spaces	4,000 spaces
4	Bicycle Share Program (Bikes + Accompanying Share Station)	0	300 stations 3,000 bicycles	50 stations 500 bicycles	50 stations 500 bicycles
	Transit Infrastructure	**LOS**	**LOS**	**LOS**	**2030**
1	Transit Crowding (% of Boardings Relative to Capacity)	N/A	N/A	85%	N/A
2	Transit Travel Time (Average Minutes per Trip)	33.72	N/A	33.60	N/A

Source: AECOM, 2013

1. Projected citywide shortfall is calculated by applying the short-term target LOS to the 2030 service population (or 2020 service population, in the case of childcare and bicycle infrastructure).

Table 2. Summary of Guiding and Reference Documents

Facility Type	Policy Document	Issuing Department	Year	Document Status
	Recreation and Open Space Element (ROSE)	Planning Department	June 2011	Draft report
	Acquisition Policy	RPD	Aug. 2011	Adopted
	San Francisco Child Care Needs Assessment	San Francisco Child Care Planning and Advisory Council (CPAC)	2007	Final report
	San Francisco Citywide Plan for Early Care and Education and Out of School Time		May 2012	Final report
	San Francisco Better Streets Plan (BSP)	Planning Department	Dec. 2010	Adopted
	Financing San Francisco's Urban Forest	DPW, Planning Department	Oct. 2012	Final report
	WalkFirst	DPH, SFMTA, Planning Department, San Francisco County Transportation Authority	Oct. 2011	Draft policy to be included in update of Transportation Element of the General Plan
	San Francisco Bicycle Master Plan	SFMTA	June 2009	Adopted
	SFMTA Bicycle Strategy	SFMTA	Dec. 2012	Internal policy document; basis for 2014 CIP project list (pending adoption of CIP project list in April 2014)
	San Francisco Transportation Sustainability Fee Nexus Study	SFMTA	Mar. 2012	Draft report

Source: AECOM, 2013

2. INTRODUCTION

In 2013, AECOM was retained by the San Francisco Planning Department and the San Francisco Capital Planning Program to conduct a review of the City and County of San Francisco's (the City's) infrastructure provision. The fundamental questions analyzed were:

1. What are the existing citywide levels of service (LOS) for the reviewed infrastructure categories?
2. What infrastructure LOS standards does the City aspire to if fiscally unconstrained?
3. What infrastructure LOS standards should the City realistically target?
4. Given LOS standards, for each infrastructure element, what is the anticipated citywide shortfall by 2030, based on population growth?

Specifically, this report provides insights into determining LOS targets for five infrastructure categories: (1) recreation and open space; (2) childcare; (3) streetscape and pedestrian infrastructure; (4) bicycle infrastructure; and (5) transit infrastructure. To determine LOS metrics and standards, this report relied on existing City plans and reports related to the five infrastructure elements. This report is intended to inform infrastructure provision in the city to address existing and future shortfalls.

The LOS targets developed as part of this work are consistent with current City plans and are intended to be applied as guidelines. The City may choose to aspire to higher goals or lower targets to account for unique neighborhood characteristics and/or available resources for investing in and maintaining new infrastructure.

PROJECT OBJECTIVES

The infrastructure LOS review and analysis portion of the project has four clear objectives:

- To evaluate existing levels of infrastructure provision and distribution throughout the city;
- To develop and propose aspirational and attainable LOS targets for the city;
- To use the existing provision along with the developed level of service standards as a capital planning tool; and
- To provide guidelines for evaluating capital projects in terms of citywide standards.

While this report does not cover the estimation of new development's share of infrastructure provision, it does provide the foundation for the Citywide Nexus Analysis.[5]

[5] Refer to the companion report, *San Francisco Citywide Nexus Analysis* (March 2014).

CAPITAL IMPROVEMENT PROGRAM PRIORITIZATION

Recognizing the critical role infrastructure plays in creating a thriving economy and vibrant communities, the City commissioned this study to continue its efforts to strategically address its infrastructure needs. In recent years the City has moved forward on a number of initiatives to strengthen its capital planning process, including establishing the Capital Planning Program and creating the City's first 10-Year Capital Plan in 2006. The Capital Plan is a fiscally-constrained, long-range plan that draws on existing planning documents, such as the City's General Plan and Neighborhood Area Plans, to guide policy and funding decisions related to infrastructure investments. The Plan is updated and approved by the Capital Planning Committee, the Board of Supervisors, and the Mayor every other year. This study, in part, will quantify the current level of infrastructure services within the city and develop target levels for those services. The results of this report will be incorporated into the City's capital planning process and help inform future infrastructure decisions.

INFRASTRUCTURE TYPES EVALUATED

The five infrastructure categories evaluated as part of this study include:


Recreation and open space


Childcare


Streetscape and pedestrian infrastructure


Transit Infrastructure


Bicycle infrastructure

These infrastructure categories reflect the majority of the current impact fees that are charged at either the neighborhood or citywide level. As such, the City wants to frame provision of these categories in a common language that allows for easy comparison across categories and across the city.

Recreation and Open Space

Recreation and open space encompasses all recreation facilities within the city limits including park land and facilities owned by the San Francisco Recreation and Parks Department (RPD), as well as state and federal park land. This study will focus on recreation and open space within the city limits provided by the City – i.e. recreation and open space owned by RPD, the Department of Public Works (DPW), the Port, and the Redevelopment Agency/Successor Agency to the San Francisco Redevelopment Agency within San Francisco. The more than 200 parks range in size from less than one acre to over 1,000 acres (Golden Gate Park), and support all kinds of recreational uses, from organized team sports and athletics, to gardening, to sunbathing and picnicking. Recreation and open space includes passive lawn space and forested areas for

"general enjoyment of outdoors" [6], courses and courts, playgrounds, and bike, pedestrian, and equestrian paths. By providing and maintaining recreation and open space, RPD aims to increase recreation opportunities, contribute to the city's environmental health, and encourage the health and well-being of San Francisco's residents and visitors.

Childcare

Childcare, in this study, refers to childcare licensed by the City. Licensed childcare facilities are classified as either licensed family childcare home (FCCH) facilities or center-based facilities, both of which can provide infant, toddler, and preschool care. The Office of Early Care and Education (OECE) keeps records of all existing licensed facilities and the total number of spaces available in each category. As well as licensing facilities, the City currently directs public funds for facilities and operations, and contributes municipal funds and impact fees to support childcare subsidies. While the City does not own or operate childcare facilities, the San Francisco Childcare Planning and Advisory Council (CPAC) works to ensure that a sufficient number of facilities are provided to meet demand. The San Francisco CPAC has identified childcare provision for infants and toddlers (ages 0-2) and preschoolers (ages 3-5) as important goals.

Streetscape and pedestrian infrastructure

Streetscape and pedestrian infrastructure encompasses a wide range of pedestrian right-of-way facilities, from simple paved sidewalks to "complete streets"[7] with sidewalks, street trees, lighting, benches, bulb-outs, signalized crosswalks, and traffic calming measures. According to the City's guiding streetscape and pedestrian infrastructure policy document (San Francisco's Better Streets Plan), the City aims to provide all types of streetscape and pedestrian infrastructure, from the basic to the most furnished, depending on the street type, the site conditions, traffic and built environment constraints, and so on. Although the streetscape infrastructure is not uniform across San Francisco, the Better Streets Plan (BSP) intends for most sidewalks to include, in addition to pavement, as least some streetscape elements such as lighting, bulb-outs, or street trees. Streetscape and pedestrian infrastructure, as a determinant of walking within the city, plays an important role in the City's transportation goals, health and safety promotion, and environmental objectives.

Bicycle Infrastructure

Bicycle infrastructure refers primarily to the city's bicycle network. The network consists of a range of bicycle route levels (LTS 1 – LTS 4) that denote rider comfort along a route. These bikeway types reflect varying levels of separation from vehicle traffic and street conditions. Because of the nature of use and location of bike facilities, the San Francisco Municipal Transportation Agency (SFMTA) works closely with the RPD as well as the Department of Public Works (DPW) on the planning and maintenance of bicycle infrastructure. Bicycle infrastructure is often planned in conjunction with SFMTA's other transportation infrastructure. Bicycle infrastructure, as a determinant of biking within the city, plays an important role in the City's transportation goals, health and safety promotion, and environmental objectives.

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[6] United States. San Francisco Recreation and Park Department. "Parks Acquisition Policy." August 2011. Print.

[7] Streets which "are safe, comfortable, and convenient for travel for everyone, regardless of age or ability – motorists, pedestrians, bicyclists, and public transportation riders." Metropolitan Transportation Commission, "MTC One Bay Area Grant: Complete Streets Policy Development Workshop." 16 October 2012. Section 2.4.13 of San Francisco's Public Works Code outlines San Francisco's complete streets policy, including the construction of transit, bicycle, stormwater, and pedestrian improvements. Pedestrian environment improvements include sidewalk lighting, pedestrian safety measures, traffic calming devices, landscaping, and other pedestrian elements listed as defined in the Better Streets Plan.

Transit Infrastructure

Transit infrastructure refers to San Francisco's network of public buses, light rail, streetcars, and cable cars run by the San Francisco Municipal Transportation Agency (SFMTA). The system provides constant service year round and works to balance system access with efficiency. Transit infrastructure plays an important role in the City's transportation goals, health and safety promotion, and environmental objectives.

APPROACH / REPORT ORGANIZATION

The work summarized in this report is organized into chapters (one per infrastructure category), with a preceding chapter (Chapter 3) summarizing the process AECOM undertook to establish an LOS, and a proceeding chapter (Chapter 12) briefly discussing project prioritization and financing.

Each infrastructure chapter is organized as follows:

- Each chapter opens with a discussion of background information about the infrastructure category and typical measures for infrastructure provision. A review of the provision of the infrastructure category within San Francisco is included, with reference to provision in case study cities.
- Metrics for that infrastructure within San Francisco are proposed. San Francisco's current provision is quantified, as per the proposed metric. An aspirational goal and a short-term target are identified, as per the proposed metric.
- San Francisco's future (2030[8]) infrastructure shortfall is assessed, assuming the current level of infrastructure is maintained while population and employment increases.

[8] In most cases the timeframe of analysis is from the current year (2013) until 2030. Two exceptions are bicycle infrastructure and childcare, for which the timeframe of analysis extends until 2020. This selection of a shorter timeframe for these two infrastructure categories is discussed in more detail in the relevant infrastructure chapter.

3. EXISTING AND PROPOSED LEVELS OF SERVICE

The following section summarizes the process AECOM undertook to establish LOS, including policy review, agency stakeholder interviews, and case study research. Initial findings are summarized.

LOS METRICS DEVELOPMENT AND EVALUATION

The process of measuring LOS provision for each infrastructure category, developing aspirational goals and realistic targets, and preparing an infrastructure gap analysis has been the same for each infrastructure type. A brief description of the process and key inputs in each step of the process are described below. Infrastructure-specific approaches and results are included in more detail in the proceeding infrastructure-specific chapters.

Again, it is important to note that the metrics and targets developed as part of this process are consistent with current City plans and are intended to be applied as citywide guidelines. The City may choose to aspire to higher goals or lower targets to account for unique neighborhood characteristics and/or available resources for investing in and maintaining new infrastructure.

LOS Metric Development

In order to develop appropriate LOS metrics for San Francisco's infrastructure facilities, AECOM relied on three key inputs:

1. Existing citywide and neighborhood policy documents;
2. Interviews and consultation with San Francisco agency stakeholders; and
3. Best practice reviews of eight cities across North America.

San Francisco Policy Review

For many of the infrastructure categories, a substantial amount of work has been done by various agencies to define LOS metrics and targets for San Francisco's infrastructure. To build on existing work, citywide and neighborhood-specific planning and policy documents were reviewed and incorporated into this report's analysis. Specific findings from citywide policy documents are included in greater detail in individual infrastructure chapters. A full list of the policies reviewed is included in the Appendix.

At the neighborhood level, few plans address concrete LOS targets, but most provide qualitative or design guidance on infrastructure improvements. In addition to design input, many neighborhood plans and nexus studies, such as the *Market & Octavia Community Improvements Program*, the *West SOMA Nexus Study*, and

the *Transbay Nexus Study* provide project prioritization based on either internal assessment of need, the San Francisco General Plan, or other infrastructure-specific plans such as San Francisco's *Short Range Transit Plan* and the *Childcare Needs Assessment.* Direction on recreation and open space LOS and targets are most common, with less neighborhood-specific direction provided on bicycle infrastructure or streetscape and pedestrian infrastructure. Although it is possible for neighborhood plans or nexus studies to define their own LOS targets, in most instances plans and nexus analyses take direction from various policy decisions made at the citywide level.

Agency Stakeholder Interviews

Interviews with City agency stakeholders were a critical part of the LOS metric and target development. Agency representatives were selected by the project client, and additional stakeholders were contacted as needed. The project team met with agency representatives for all five infrastructure categories evaluated in addition to Planning Department and Capital Planning Program representatives.

A full list of the agencies and stakeholders consulted is included in the Appendix.

Best Practices – Case Study Review

Eight cities across North America were reviewed to evaluate how other comparable cities are measuring LOS, applying LOS metrics to their infrastructure provision, and using LOS standards to prioritize investment. The selected cities are comparable to San Francisco in that they are either: (1) built-out cities that rely on urban infill for growth (or have strong urban growth boundaries)[9], or (2) city-county municipalities. In addition, two cities from California were reviewed to understand how they address the state-specific political and economic challenges. The case study cities reviewed are:

1. Boston, Massachusetts (built-out city)
2. Miami, Florida (city-county)
3. Minneapolis, Minnesota (city-county)
4. Philadelphia, Pennsylvania (built-out city, city-county)
5. Portland, Oregon (built-out city)
6. San Diego, California (California)
7. San Jose, California (California)
8. Vancouver, Canada (built-out city)

Through policy review and interviews with city officials, it is clear that, while many cities quantify infrastructure provision for various infrastructure categories, the practice of creating or applying developed LOS metrics is a relatively uncommon one.

Key findings of the case study review include:

LOS metrics are uncommon practice - While many cities quantify infrastructure provision for various facilities, the practice of creating or applying developed LOS metrics was uncommon in the cities surveyed.

[9] Note that the analysis specifically considered built-out cities because the provision of additional infrastructure is very different than in cities still expanding their boundaries. Expanding cities can set specific master planning guidelines and dictate levels of service on new development; and, because these projects are establishing new urban areas, there is a much simpler nexus between the infrastructure requirement and the development.

Additionally, while some facilities, such as recreation and open space have well-accepted public metrics (e.g. acres of park per 1,000 residents), others, such as childcare and streetscape and pedestrian infrastructure are rarely expressed in quantified levels of service.[10] Many of the case study cities are large, built-out cities that do not have large master plan areas where citywide guidance is required for infrastructure provision. Some Californian cities set park and right-of-way standards for large new developments, especially where a comprehensive development fee program is in place, but this practice is less prevalent among cities where the predominant form of development is infill.

In Portland's *2012 Citywide Assets Report*, the City identified establishing LOS as one of its priorities. Several other interviewed cities expressed a sincere interest in learning more about San Francisco's LOS development. Because LOS metrics and targets are not necessarily a common practice for all infrastructure categories, when metrics are provided, their non-standardized nature tends to make cross-city comparison difficult. LOS provision for each case study city is summarized in the Appendix in Table 30 and notable City goals are included in the infrastructure sections.

LOS targets tend to be qualitative – More often than not, infrastructure goals provided in the case study cities' planning documents tend to be either qualitative (e.g. improve "walkability"), or very specific (e.g. build an additional 10 miles of bicycle network on 12th Street). These goals are rarely clearly tied to demand. Identified LOS targets for each case study city are summarized in the Appendix in Table 31.

LOS targets tend to be aspirational – When quantitative LOS targets are provided, they tend to be aspirational rather than financially realistic. Many cities indicated that they fall short of the goals set forth in planning and policy documents, and that the goals were intended primarily as a guide rather than as a mandate. Table 3 summarizes some of the LOS metrics that are used in the case studies or in academic policy documents. These metrics were reviewed with agency stakeholders to determine whether any of them would be appropriate for San Francisco. It was noted that aspirational targets can be problematic if too ambitious. An oversupply of infrastructure can overburden limited operations and maintenance capacity. For example, a highly ambitious recreation and open space standard, and subsequent provision, can lead to unmaintained park lands and deteriorating public assets. Street tree provision is another example of where the ongoing care is as important as the initial planting and establishment of the street trees.[11]

[10] Note that there are a number of smaller California cities (such as Berkeley, Santa Monica, and Palo Alto) that consider childcare provision in their needs assessment of community facilities, and require developers to accommodate their fair share of future childcare needs.

[11] AECOM, "Financing San Francisco's Urban Forest – The Benefits and Costs of a Comprehensive Street Tree Program." October 2012. Print.

Table 3. Common Findings and Infrastructure LOS Metrics

Infrastructure Type	Finding	Metrics Considered
Recreation and Open Space	In addition to the longstanding metric of acres per 1,000 residents, many cities are also evaluating access and proximity measures.	• Percent of total land area • Distance to nearest park per resident • Acres per 1,000 residents • Acres per household • Municipal spending per capita • Tree canopy coverage
Childcare Facilities	Likely because of the primarily private provision, childcare facilities are rarely addressed as a city infrastructure requirement.[12]	• Childcare spaces per resident • Square foot of childcare facilities per child • Percent of demand accommodation
Streetscape and Pedestrian Infrastructure	Most cities tend to have qualitative goals associated with streetscape and pedestrian infrastructure – addressing quality and aesthetics rather than quantity. Goals to increase pedestrian mode share[13] are common, without necessarily concrete action plans. Right-of-way standards for new greenfield development are common but often developed at a Master Plan or Specific Plan level.	• Percent of streets with sidewalks • Linear feet of sidewalk per resident • Pedestrian Environmental Quality Index (PEQI)[14] • Street tree provision or canopy coverage • Customized metrics incorporating lighting, sidewalk width, separation from traffic, adjacent road speed, etc.
Bicycle Infrastructure	Increasing bicycle mode share was a common goal (Boston, Philadelphia, Portland, and Vancouver). Almost all cities have developed bicycle master plans with target bicycle networks identified. Miami and Philadelphia both had "bike friendly" status goals tied to national organization rankings.	• Percent of streets with bike lanes • Linear feet of bike lane per resident (or per service population[15]) • Mode share • Customized metrics incorporating width, encounter frequency, adjacent road speed, etc.
Transit Infrastructure	Transit LOS is typically much more difficult to evaluate given its complexity. Many cities have transit mode share goals (Portland, San Jose, and Vancouver).	• Transit score • Mode share • Customized metrics incorporating headways, trip times, reliability, schedule range, seat availability, etc.

Source: AECOM, 2013.

Where possible, LOS provision for each case study city, as well as San Francisco, is summarized in the Appendix in Table 30.

Case study findings related to infrastructure prioritization and financing are included in Chapter 11.

[12] Berkeley, Santa Monica, Palo Alto, and Concord are all examples in California of cities that do address childcare provision.
[13] Mode share measures the percentage of all transportation trips that use a given "mode." Walking, bicycle, public transit, and private vehicles are the most common modes of travel.
[14] "Pedestrian Environmental Quality Index ." *Program on Health, Equity and Sustainability.* San Francisco Department of Public Health. Web. 31 June 2013. http://www.sfphes.org/elements/24-elements/tools/106-pedestrian-environmental-quality-index
[15] Service population is a unit of measure that encompasses all local infrastructure users, including residents and employees. Residents are assigned one point, while employees are typically assigned 0.5 points to reflect their lower level of usage. For recreation and open space, service population is calculated by assigning residents one point, and employees 0.19 points. Refer to the companion report, *San Francisco Citywide Nexus Analysis* (March 2014), and its appendix report, *San Francisco Citywide Nexus Analysis – Service Population Concept Memorandum* (September 24, 2013) for more detail.

CURRENT LOS PROVISION EVALUATION

Using the identified metrics, the infrastructure provision for all categories, with the exception of transit infrastructure and childcare,[16] were mapped using GIS.[17] Mapping the infrastructure provision allows for both the evaluation of a citywide LOS, and, in some cases, an understanding of how infrastructure provision is distributed across the city's 37 neighborhoods. These citywide and neighborhood provision maps can help inform how capital funds may be prioritized based on current distribution.

The developed LOS metrics aim to account for variations in service density, demand, and other factors. However, it is not always possible to account for all factors that influence geographic demand and supply variation of an infrastructure type.

LOS and Infrastructure Standard Development

Two tiers of standards are included as part of this study: (1) long-term aspirational goals and (2) short-term targets.

Both the long-term aspirational goals and short-term targets were identified based on existing policies and department direction, or as a result of reviewing the existing LOS provision. The bifurcation is meant to balance the City's ideal infrastructure aspirations with what it can reasonably expect to provide, given capital and operations budgets and other external limitations. The long-term aspirational goals represent an ideal level of service for each infrastructure category absent any constraints. The short-term targets are intended to indicate what the City will aim to provide for its residents by 2030, or in the case of childcare and bicycle infrastructure, in a shorter time frame (2020). The short-term targets are intended to ground expectations and help ensure equitable distribution of infrastructure; however, the aspirational goals established through policy work and community-based planning will continue to influence the City's long-term infrastructure planning.

As with the LOS metrics, some departments have already invested a significant amount of effort in developing detailed needs assessments for San Francisco and for specific neighborhoods. It is important to note that in no way does this work, particularly the gap assessment, intend to override the analysis that has already been done by various agencies.

Infrastructure Shortfall and Gap Analysis

LOS targets are overlaid on the city's current LOS provision to identify variations in shortfall and surplus throughout the city. The LOS targets are also overlaid on the projected future (2030 or 2020) population to determine the projected shortfall, if no infrastructure investment was made.

Many of the gap analyses are presented at the neighborhood level, and are meant to serve as a high-level overview of the distribution of services throughout the city. Given the nature of many of the infrastructure facilities, it is often not possible or not appropriate to provide an equal LOS in each of the neighborhoods. For example, recreation and open space varies throughout the city based on urban form: in the downtown, open space requirements are nearly impractical to apply where there are few, if any, land acquisition opportunities that could support the development of a neighborhood park. As well, some areas of the city require higher levels of service than others. For this reason, the LOS provision targets apply to the entire city, not to individual

[16] The LOS metrics identified for transit are only available as citywide indicators and are not geographically located.
[17] For a complete list of data sources, see Table 29. The LOS metrics identified for childcare are based on citywide demand, and, given data limitations, cannot be geographically disaggregated.

neighborhoods. It is worth noting as well that neighborhood-level analysis by definition uses neighborhood boundaries. In some cases, neighborhood provision may be distorted where infrastructure falls across a neighborhood line, but clearly also serves adjacent neighborhoods. This idiosyncrasy is a function of neighborhood-level analysis and is a reminder that the analysis is an informational tool.

The results of the LOS target evaluation for all of the infrastructure metrics are summarized in Table 4.

Table 4. Summary of LOS Metrics for Five Infrastructure Categories

Facility Type	LOS Metric	Current Citywide Average	Long-term Aspiration	Short-term Target	Projected Citywide Shortfall [1]
	Recreation and Open Space	**LOS**	**LOS**	**LOS**	**2030**
1	Acres of City-Owned Open Space / 1,000 Service Population Units (SPU)	4.0	4.0	4.0	566 acres
1.1	*Acres of Open Space / 1,000 SPU*		*3.5*	*3.5*	*55 acres*
1.2	*Acres of Improved Open Space / 1,000 SPU*		*0.5*	*0.5*	*511 acres*
2	Acres / 1,000 Adjacent Residents	0.7	0.5	0.5	N/A
	Childcare	**LOS**	**LOS**	**LOS**	**2020**
1	% of Infants and Toddlers (0-2) Childcare Demand Served by Available Licensed Slots	37%	100%	37%	2,529 spaces
2	% of Preschool Age Children (3-5) Childcare Demand Served by Available Licensed Slots	99.6%	100%	99.6%	2,256 spaces
	Streetscape and Pedestrian Infrastructure	**LOS**	**LOS**	**LOS**	**2030**
1	Square feet of improved sidewalk space per service population unit	103 square feet of sidewalk / SPU	88 square feet of *improved* sidewalk / SPU	88 square feet of *improved* sidewalk / SPU	N/A
	Bicycle Infrastructure	**Infrastructure**	**Infrastructure**	**Infrastructure**	**2020**
1	Number of Premium (LTS 1, 2) Network Miles	51 miles	251 miles, 100%	61 miles	10 miles
2	Number of Upgraded Intersections	3 intersections	203 intersections	13 intersections	10 intersections
3	Number of Bicycle Parking Spaces	8,800 spaces	58,000 spaces	12,800 spaces	4,000 spaces
4	Bicycle Share Program (Bikes + Accompanying Share Station)	0	300 stations 3,000 bicycles	50 stations 500 bicycles	50 stations 500 bicycles
	Transit Infrastructure	**LOS**	**LOS**	**LOS**	**2030**
1	Transit Crowding (% of Boardings Relative to Capacity)	N/A	N/A	85%	N/A
2	Transit Travel Time (Average Minutes per Trip)	33.72	N/A	33.60	N/A

Source: AECOM, 2013

1. Projected citywide shortfall is calculated by applying the short-term target LOS to the 2030 service population (or 2020 service population, in the case of childcare and bicycle infrastructure).

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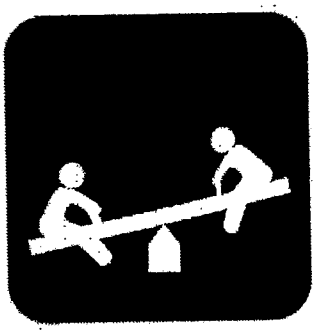
4. RECREATION AND OPEN SPACE



Recreation and open space infrastructure is one of the infrastructure types that has received a significant amount of thought, public outreach, and organization from the City. This section will outline conventions as well as existing San Francisco policy metrics for measuring open space provision, with case study comparisons where applicable. This section will then propose metrics and undertake an assessment of existing conditions based on those metrics. Table 5 below notes the City policies referenced in this section; full texts of these policies are appended for information. Note that the terms parks, parkland, open space, and recreation space are used synonymously in this section to refer to recreation and open space. For information, an overview of San Francisco open space is mapped, by ownership (Figure 1).

Table 5. Recreation and Open Space Guiding and Reference Policy Documents

Policy Document	Issuing Department	Year	Document Status	Key Contributions
Recreation and Open Space Element (ROSE)	Planning Department	June 2011	Draft report	• Identification of "areas of need" based on socioeconomic measures and access to park land • Information on existing and proposed open space
Acquisition Policy	RPD	August 2011	Adopted	• Definition of "passive" and "active" open space • "High-needs area" metric definition

Source: AECOM, 2013.

BACKGROUND

Recreation and open space has historically been measured as a ratio of acreage to residents. In 1981, the National Park and Recreation Association (NPRA) defined what has since become a ubiquitous standard recommendation of 10 acres of park per 1,000 people.[18] In recent years, this general rule has been modified by planners and municipal governments to reflect more reasonable ratios for densely-populated, built-out cities.

[18] Fogg, George E. National Recreation and Park Association, Park Planning Guidelines. 1981.

Published standards for cities have ranged from 4 to 10 acres per 1,000 residents.[19] San Francisco currently provides 4.6 acres of *city-owned* recreation space[20] per 1,000 residents, and 8.2 acres per 1,000 residents of *total* recreation space (including county, metro, state, and federal acres within the city limits, such as the Presidio). More tellingly, San Francisco provides 4.0 acres of *city-owned* recreation space per 1,000 *service population units* and 7.2 *total* acres per 1,000 *service population units*.[21] This measure of provision per service population unit more accurately describes San Francisco's LOS, as it includes employees, who also use park resources.

While all case study cities provide context, New York and Vancouver in particular are San Francisco's cohort for open space: all three cities are geographically constrained within a small land area and support high population densities. San Francisco, at 4.6 city-owned acres per 1,000 residents, falls between New York at 3.5[22] and Vancouver at 7.0.[23] [24] According to a Trust for Public Land survey, New York provides 4.6 acres of total open space per 1,000 residents within the city limits, compared with San Francisco's 8.2. [25]

Another perspective on open space addresses access. Many cities (Miami, Philadelphia, Portland, and Vancouver) aim to provide open space within walking distance of residents. A stock measure of accessibility is a ten-minute walk, which is roughly equivalent to a half mile distance. The Planning Department undertook an accessibility study of San Francisco, by imagining walksheds of half mile radii around every park, and determining any excluded city area. As reported in the ROSE, this analysis shows that almost everywhere within San Francisco is within a half mile from open space. From an accessibility standpoint, San Francisco scores well, and this metric does not represent much opportunity for improvement. This metric of residents within a half mile radius of open space is a common metric among recreation authorities; but, since San Francisco essentially achieves the standard, the accessibility metric is excluded from this discussion.

CASE STUDY COMPARISON: PROVISION AND METRICS

In a review of LOS metrics and goals for other cities, the two most frequent metrics consider issues of access (distance from parks) and quantity (amount of parks). Both of these metrics are reflected in RPD's current provision policies and goals, which are compared to the metrics for five case study cities (Table 6, Table 7). Note that some cities, such as San Diego, only have goals for "neighborhood and community parks," while others have quantified goals that include other types of regional and open space parks, which distorts the comparisons. As Table 6 and Table 7 show, most cities are performing well relative to their goals and their current provision.

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[19] Moeller, John. American Society of Planning Officials, Standards for Outdoor Recreational Areas. Information Report No. 194. https://www.planning.org/pas/at60/report194.htm?print=true

[20] City-owned recreation space includes land owned by RPD, DPW, the Port, and the Redevelopment Agency/Successor Agency to the San Francisco Redevelopment Agency

[21] For recreation and open space, service population is calculated by assigning residents one point, and employees 0.19 points. For a more complete definition of service population see the Service Population Definition in the Appendix (p.83). Refer also to the companion report, *San Francisco Citywide Nexus Analysis* (March 2014), and its appendix report, *San Francisco Citywide Nexus Analysis – Service Population Concept Memorandum* (September 24, 2013) for more detail.

[22] An estimated 29,000 acres of New York City's 38,000 acres of park land are city-owned (The Trust for Public Land, 2011 City Park Facts Report, http://www.tpl.org/publications/books-reports/ccpe-publications/city-park-facts-report-2011.html) and serve New York's roughly 8.3 million residents (U.S. Census Bureau, 2011).

[23] See Table 30 in the Appendix. San Jose and San Diego's numbers may include regional parks within the city boundaries, resulting in inflated metrics compared to San Francisco and Vancouver.

[24] These New York and Vancouver metrics do not include county, state, and federal acres within the city limits.

[25] "2011 City Park Facts Report." The Trust for Public Land. The Trust for Public Land, 1 Nov. 2011. Web. 22 Jul. 2013. http://www.tpl.org/publications/books-reports/ccpe-publications/city-park-facts-report-2011.html

Table 6. Current LOS Provision Comparison - Recreation and Open Space[1,2]

San Francisco	Philadelphia	Portland	San Diego	San Jose	Vancouver
• Over 200 city-owned parks • 6,600 acres of open space within city limits • 3,600 acres of active space	• 60% of residents live within 10 minutes / 0.5 mi of open space	• 70% of residents within 3 miles of full-service community center • 75% of residents within 0.5 mi of a park	• 2.8 acres per 1,000 residents for neighborhood and community parks, subject to "equivalencies" as determined at the community plan level	• N/A	• 92% of residents live within 5 minutes of green space
• 6.6 acres / 1,000 residents (per Trust for Public Land Data) • 8.1 acres per 1,000 residents (per RPD data)	• 7.2 acres / 1,000 residents	• 24.6 acres / 1,000 residents (Intermediate - Low density city)	• 35.9 acres / 1,000 residents (Intermediate - Low density city)	• 16.5 acres / 1,000 residents	• 6.97 acres / 1,000 residents (without regional parks)

Source: Various city agencies

1. Only select cities are included (see Table 30 for additional cities).
2. Data on acres of open space per 1,000 residents is from the Trust for Public Land, "Acres of Parkland per 1,000 Residents, by City." http://cityparksurvey.tpl.org/reports/report_display.asp?rid=4

Table 7. City LOS Aspirational Goals Comparison - Recreation and Open Space

San Francisco[1]	Philadelphia	Portland	San Diego	San Jose	Vancouver
• 10 minute / 0.5 mi access to open space for all residents • 0.5 acres per 1,000 residents within a 0.5 mi radius	• 75% of residents live within 10 minutes / 0.5mi of open space by 2025 • Add 500 acres by 2015 • 10 acres per 1,000 residents	• 100% of residents within 3 miles of a community center • 100% of residents within 0.5 mi of a park • By 2020, 1,870 more acres of park	• 2.8 acres per 1,000 residents of neighborhood and community parks • 35 acres per 1,000 residents for all parks, including regional	• 31 acres per 1,000 residents • 3.5 acres of community serving parks per 1,000 residents	• 100% of residents within 5-min walk to green space, by 2020 • Plant 150,000 new trees by 2020

Source: Various city agencies

1. Only cities with relevant LOS metrics are included (see Table 31 for additional cities).

RECREATION AND OPEN SPACE LOS METRICS

Two metrics were identified to measure recreation and open space infrastructure LOS. The two metrics are intended to measure total type of provision, and distribution and intensity of use. The two LOS metrics are:

- Acres of City-owned open space per 1,000 service population units
- Acres per 1,000 adjacent residents

Acres of Active Open Apace per 1,000 Service Population Units

Table 8. Acres of Active Open Space per 1,000 Service Population Units – LOS Provision, Goal, and Target

LOS Measure	Value	Source
Current Citywide Average	• 4.0 acres of City-owned open space (within City limits) per 1,000 service population units	• See Table Note
Long-term Aspirational Goal	• 4.0 acres of City-owned open space (within City limits) per 1,000 service population units, achieved either through newly constructed open space or improvement to existing open space o 3.5 acres of open space per 1,000 service population units o 0.5 acres of improved open space per 1,000 service population units	• RPD staff members Dawn Kamalanathan, Planning Director, Stacey Bradley, Planner, and Taylor Emerson, Analyst
Short-term Target	• 4.0 acres of City-owned open space (within City limits) per 1,000 service population units, achieved either through newly constructed open space or improvement to existing open space o 3.5 acres of open space per 1,000 service population units o 0.5 acres of improved open space per 1,000 service population units	• RPD staff members Dawn Kamalanathan, Planning Director, Stacey Bradley, Planner, and Taylor Emerson, Analyst

Note: RPD staff members Dawn Kamalanathan, Planning Director, Stacey Bradley, Planner, and Taylor Emerson, Analyst, noted in a meeting on November 14, 2013, that RPD owned approximately 3,437.28 acres of open space within the City and that other City agencies – DPW, the Port, and the Redevelopment Agency/Successor Agency to the San Francisco Redevelopment Agency – owned another approximately 324.4 acres. Given the 2013 recreation and open space service population of 934,726, the current citywide average acreage per 1,000 service population units is calculated to be 4.0. RPD staff members also noted that the City could feasibly commit to constructing 55 new acres of open space by 2030, which results in 3.5 acres of open space per 1,000 service population units (2030 service population of 1,081,926). The remaining 0.5 acres of open space per 1,000 population units will be achieved through capacity improvements to existing open space. Refer to the companion report, the *San Francisco Citywide Nexus Analysis* (March 2014), for a more detailed discussion of capacity improvements to recreation and open space and the LOS implications.

While acres of open space *per resident* represents the conventional measure, service population units are used for this metric to reflect that parks serve both the resident and employee population.[26] Open space acreage is confined to City-owned open space within city limits to reflect the open space upon which the City can effect change.

RPD staff has set the current citywide LOS of 4.0 acres of City-owned open space per 1,000 service population units as both the short-term LOS target for 2030 and the long-term aspirational goal (Figure 2, Figure 3). San Francisco's density and expensive land costs limit the creation of new park space. Based on conversations with RPD staff, RPD's focus is expected to be maintaining existing acreage, improving current acreage, prioritizing upgrades, improving areas of need, and constructing a limited amount of new acreage. Of the 4.0 acres of City-owned open space per 1,000 service population units, 3.5 acres per 1,000 service population units will be achieved in open space acreage and the remaining 0.5 acres per 1,000 service population units will be achieved by improving the capacity of existing open space. The companion report, the *San Francisco Citywide Nexus Analysis* (March 2014), includes a more detailed discussion of recreation and open space capacity improvements and the LOS implications.

[26] For a more complete definition of service population see the Service Population Definition in the Appendix (p.83).

Infrastructure Shortfall and Gap Analysis

No shortfall exists at the current time, given that the metric target is based on maintaining the current provision into the future, although some neighborhoods, however, fall below the short-term target. As the population increases, by 2030, if the amount of open space remains the same, the LOS metric will fall from 4.0 to 3.5, and the acquisition of approximately 566 additional acres of park space will be required to address growing demand (Figure 3).[27] These additional acres could be created by acquiring land and constructing new open space or by expanding the capacity of existing open space.[28] Given San Francisco's density and land costs, 566 acres of new park space is an unlikely ambition by an order of magnitude. Instead the majority of 'new' open space is likely to be an increase in the capacity of existing parks, rather than the acquisition of more land for new park construction. RPD staff estimates that they can feasibly commit to constructing 55 new acres of open space by 2030, and increase the capacity through open space improvements of the remaining 511 acres.[29]

[27] This calculation is based on demographic projections from the San Francisco Planning Department, received by AECOM on May 14, 2013 from Aksel Olsen, Planner/Geographer in the Citywide Information and Analysis Group, San Francisco Planning Department.

[28] Expanding the capacity of existing open space involves, for example, adding a second floor to a recreation center, adding lighting to a tennis court to extend its hours (so more people can use it), adding trails to a forested area, adding a play feature to a playground, or adding an athletic field to a lawn park.

[29] Refer to the companion report, the *San Francisco Citywide Nexus Analysis* (March 2014), for a more detailed discussion of recreation and open space capacity improvements and the LOS implications.

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Citywide Park Provision (2013)	
Total City Open Space (existing acres)	6,737
City-Owned Open Space (existing acres)	3,762
Non-City-Owned Open Space (existing acres)	2,975
Total Acres / 1,000 Residents	8.2
Total Acres / 1,000 SPU*	7.2
Total City-Owned Acres / 1,000 Residents	4.6
Total City-Owned Acres / 1,000 SPU*	4.0

*Service Population Unit

LEGEND

- County Boundary
- Neighborhoods
- Highways

Open Space by Ownership

- Non-City-owned open space
- City-owned open space

NORTH

Feet
0 3,000 6,000

Scale: 1 inch = 6,000 feet

Source: San Francisco RPD

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Figure 1. Total Recreation and Open Space by Ownership (2013)

San Francisco Infrastructure Level of Service Analysis

February 2014

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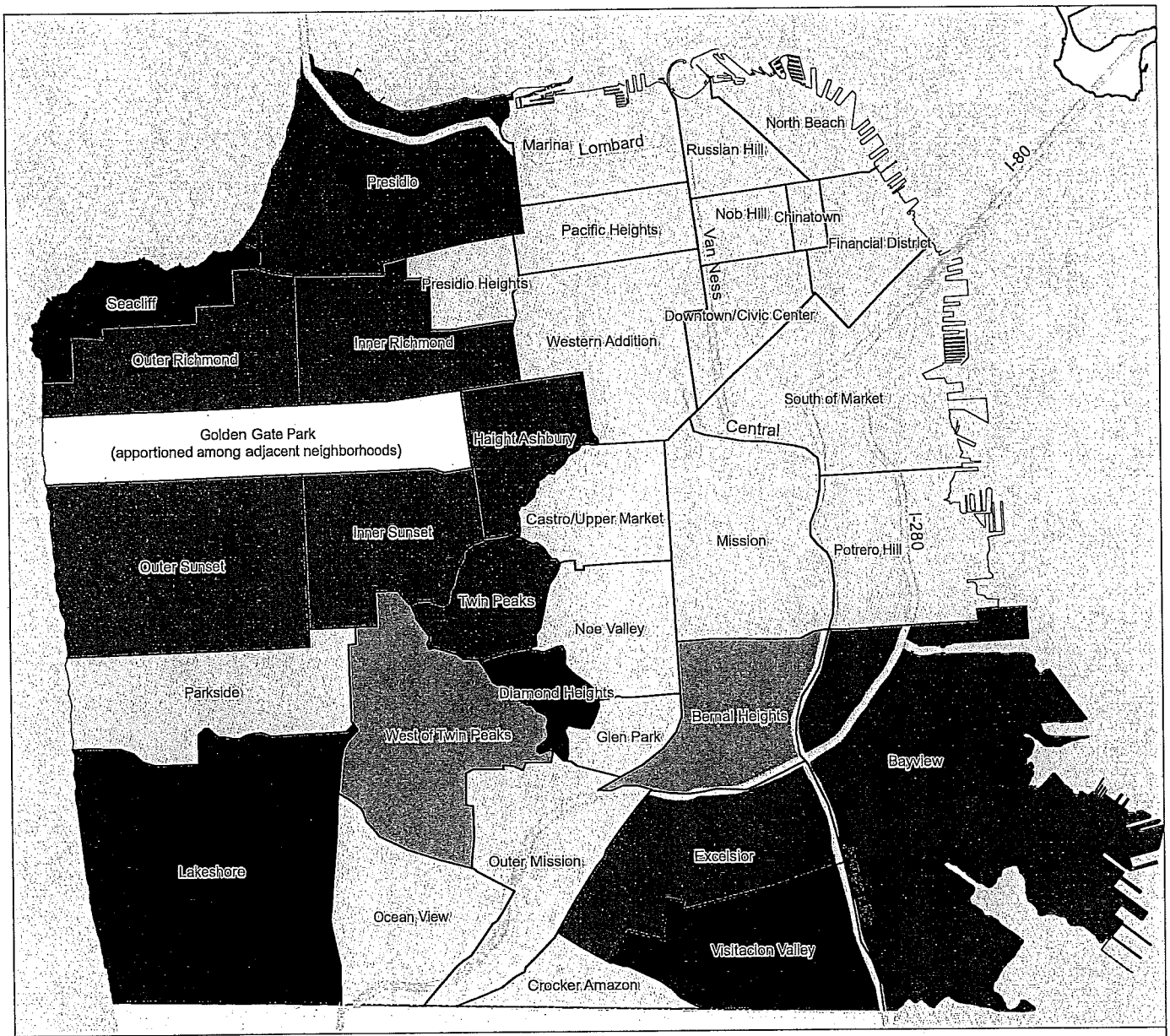

Citywide Park Provision (2013)	
Total City-Owned Open Space* (existing acres, 2013)	3,762
LOS Metric - Acres of City-Owned Open Space / 1,000 SPU**	
Existing Citywide Average (2013)	4.0
Short-term Target (2030)	4.0
Existing Citywide Shortfall (Acres)	0

*City-owned open space includes open space owned by RPD, DPW, the Port, and the Redevelopment Agency/Successor Agency to the San Francisco

** Service Population Units

LEGEND

- ----- County Boundary
- —— Neighborhoods
- Highways

NORTH

Feet
0 3,000 6,000
Scale: 1 inch = 6,000 feet
Source: San Francisco RPD

City-Owned Open Space Per 1,000 Service Population Unit

- Under 2.0
- 2.0 - 4.0 (Citywide average, 2013)
- 4.0 - 10.0
- Above 10.0

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Figure 2. Total City-Owned Recreation and Open Space per 1,000 Service Population Units (2013)

San Francisco Infrastructure Level of Service Analysis

February 2014

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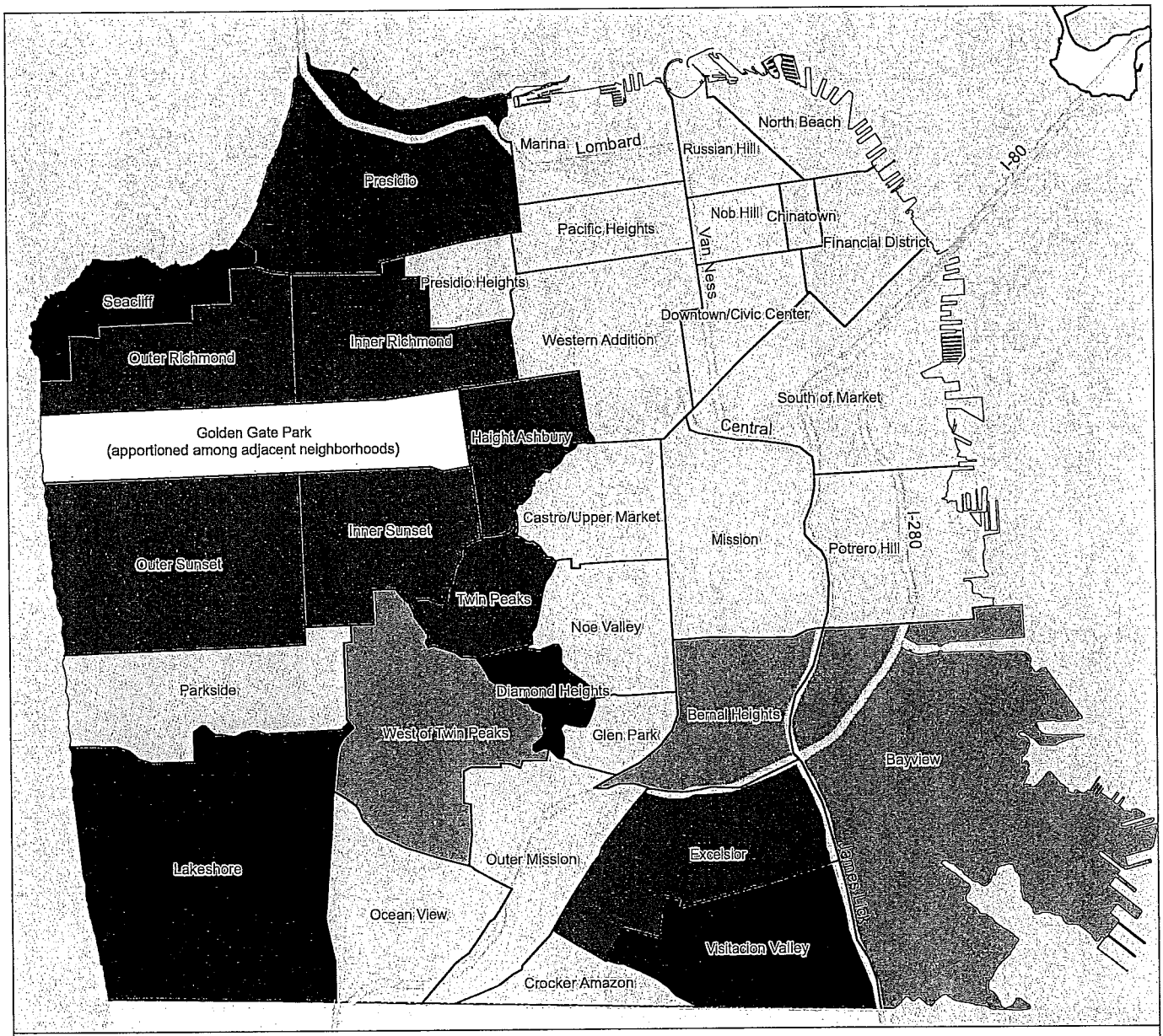

Citywide Park Provision (2030)	
Total City-Owned Open Space* (existing acres, 2013)	3,762
LOS Metric - Acres of City-Owned Open Space / 1,000 SPU**	
Projected Citywide Average (2030)***	3.5
Short-term Target (2030)	4.0
Projected Citywide Shortfall (Acres)	566

*City-owned open space includes open space owned by RPD, DPW, the Port, and the Redevelopment Agency/Successor Agency to the San Francisco Redevelopment Agency

**Service Population Units

***Projected Citywide Average (2030) assumes the addition of no open space acres - i.e. assumes existing acreage is maintained while population grew

LEGEND

- County Boundary
- Neighborhoods
- Highways

NORTH

Feet: 0 3,000 6,000

Scale: 1 inch = 6,000 feet

Source: San Francisco RPD

City-Owned Open Space Per 1,000 Service Population Unit

- Under 2.0
- 2.0 - 4.0 (Short-term target, 2030)
- 4.0 - 10.0
- Above 10.0

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Figure 3. Total City-Owned Recreation and Open Space per 1,000 Service Population Units (2030)

San Francisco Infrastructure Level of Service Analysis

February 2014

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Acres Per 1,000 Adjacent Residents

Table 9. Acres per 1,000 Adjacent Residents – LOS Provision and Targets

LOS Measure	Value	Source
Current Citywide Average	• Average of 2.7 acres of open space per 1,000 adjacent residents • Median of 0.7 acres of open space per 1,000 adjacent residents • 135 parks with less than 0.5 acres per 1,000 adjacent residents	• RPD and Planning Department data (see Table 29)
Long-term Aspirational Goal	• 0.5 acres of open space per 1,000 adjacent residents at all parks	• RPD's Acquisition Policy, High Needs Area definition, p 20.
Short-term Target	• 0.5 acres of open space per 1,000 adjacent residents at all parks	• RPD's Acquisition Policy, High Needs Area definition, p 20.

The acres per 1,000 adjacent residents metric is intended to measure whether residents are over- or under-served by their *proximate* parks. The metric is a partial proxy for park crowding, or, intensity of use. This metric enables the City to quantify varying park demand in a given neighborhood related to residential density.

While San Francisco has a high acreage per resident (8.6 acres per 1,000 residents), this citywide indicator does not account for the distribution of space relative to population distribution. This metric shows where small parks serve an inordinate amount of nearby residents.

This metric is a variation of a more typical LOS metric: distance from a park for all residents. A number of other cities including Miami, Philadelphia, Portland, and Vancouver use a proximity metric to evaluate adequate LOS provision in their policy documents.[30] Analysis presented in the ROSE highlights an RPD target of having all residents live within one half mile of a park, equivalent to a ten-minute walk. However, as demonstrated by the analysis, San Francisco is already close to achieving this target, making it a less useful goal.

Instead, guided by the 2011 Acquisition Policy, the proximity metric was modified to assess the *amount* of space within a reasonable distance of residents. The 2011 Acquisition Policy includes a discussion of "high needs areas," defined as places with a high population density relative to open space. Generally this is quantified as less than 0.5 acres per 1,000 people within a half mile radius. The LOS target, therefore, is 0.5 acres per 1,000 adjacent residents, with this threshold defining the difference between well-supplied parkland and overcrowded or under-supplied parkland.

The analysis for this metric was performed by attributing census block populations to their nearest park (neighborhood boundaries were ignored). Populations will typically be within a half-mile of their nearest park, given the distribution of parks in San Francisco.[31] Satisfying the distance requirement, this metric emphasizes the acreage component of the high needs area definition.

[30] Miami has a quarter mile access to open space target. Philadelphia aims to have 75 percent of residents living with a half mile of a park by 2025. Portland targets 100 percent of residents within a half mile by 2020. Vancouver is working towards having 100 percent of residents live within a quarter mile or 5 minutes of green space by 2020 – see Table 31.

[31] Analysis by the Planning Department, reported in the ROSE plan, shows that half-mile radius buffers around all parks in San Francisco encompasses almost the entirety of the City.

Infrastructure Shortfall and Gap Analysis

The LOS target results in 135 parks being deficient, with values below 0.5 acres per 1,000 adjacent residents.[32] Because block-level population projections are not available, it is not possible to anticipate 2030 shortfalls.

Based on this metric analysis, 41 percent of residents, or 330,000 people, are served by over-crowded parks. Not surprisingly, neighborhoods with higher land use intensity experience park overcrowding as measured by this metric. These areas were also identified in the City's ROSE as high needs areas.

PRACTICAL APPLICATION OF RECREATION AND OPEN SPACE METRIC

While both proposed metrics are important in measuring the quantity and distribution of open space, in its practical application, the acres of City-owned open space per 1,000 service population units best represents RPD's development and LOS intentions. As a result, this metric will inform the nexus between development and development impact fees.

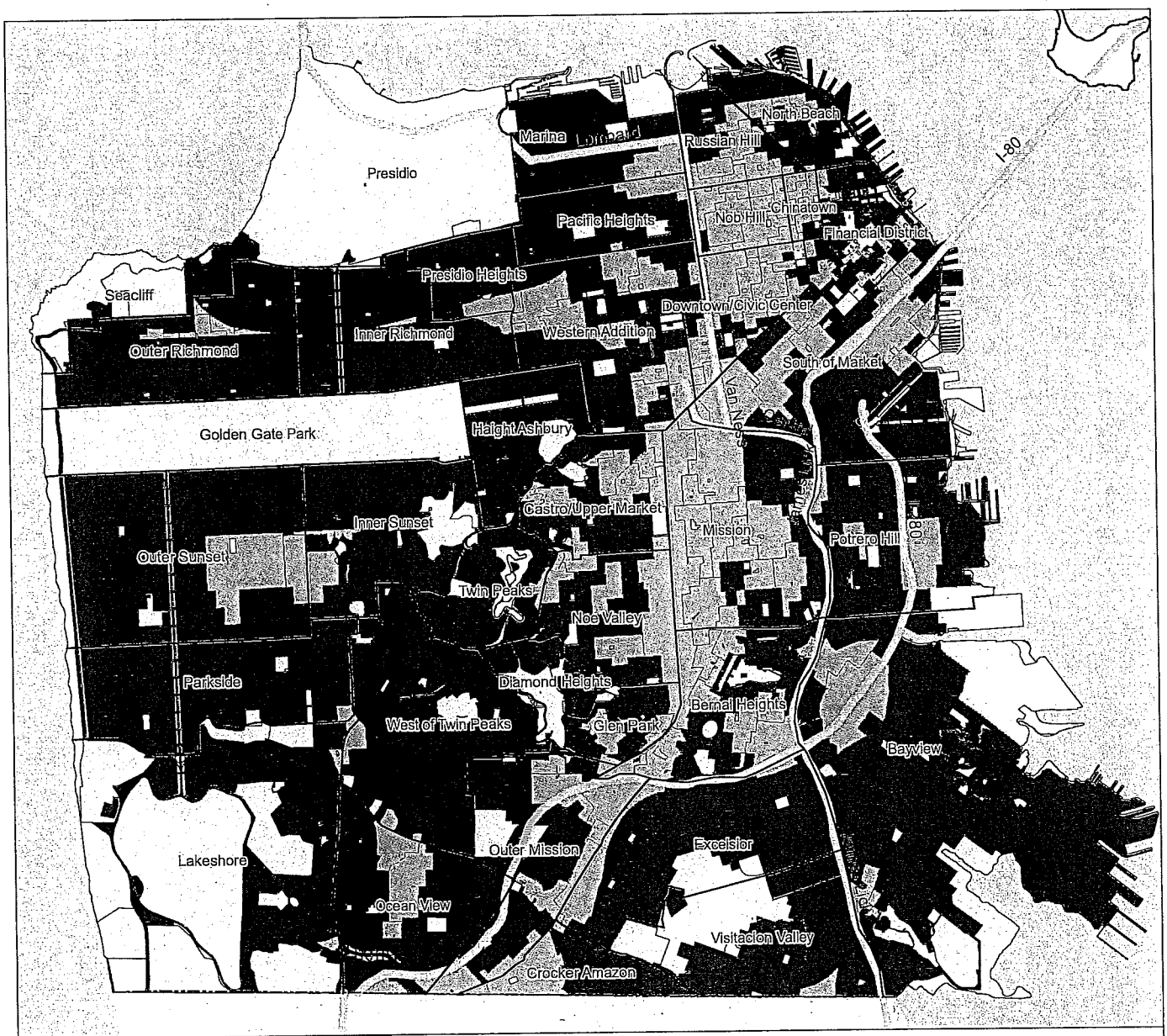
PROPOSED OPPORTUNITIES FOR FURTHER STUDY

The following studies were identified in the LOS metric development process as potential next steps in the continued refinement of the City's recreation and open space provision evaluation:

- Cataloging usage of City-owned park elements (such as playgrounds or basketball courts) to develop an understanding of their capacity (children playing per hour or basketball players per hour).
- Cataloging usage of City-owned parks to determine the amount of people the average park serves, which parks are the most used or crowded, which parks are least used, and so on.

This additional data would allow the city to evaluate provision and distribution in greater detail.

[32] The LOS target results in a citywide average of 2.7 acres per 1,000 adjacent residents (Figure 4).This average seems to satisfy the target, but it is important to remember that large parks and areas with low populations will have high acreages per 1,000 adjacent residents, inflating the average. The median, by comparison, is 0.7 acres per 1,000 residents.



Citywide Park Use Intensity (2013)	
Total Number of Parks Analyzed*	360
LOS Metric - Total Acres / 1,000 Adjacent Residents	
Current Citywide Median (2013)**	0.7
Short-term Target (2030)***	0.5
Projected Citywide Shortfall (Acres)	100

* Parks with attributed blocks of zero population or with no attributable blocks excluded; Mission Bay parks conglomerated

** Excluded extreme outliers (populations below 100; acreages above 100), but the average is still inflated by low population blocks and high acreage parks. 135 parks deficient, although median is above LOS goal.

*** Per San Francisco RPD 2011 Acquisition Policy

NB: Half-mile radius drawn around five largest parks (Presidio, Golden Gate, Lake Merced, John McLaren, and SFSU) to include nearby census blocks although a smaller park may technically be closer.

LEGEND

- County Boundary
- Neighborhoods
- Highways
- Recreation/open space
- Blocks with zero population

Acres of Open Space per 1,000 Adjacent Residents

- At or above 0.5
- Below 0.5

NORTH

Feet
0 3,000 6,000

Scale: 1 inch = 6,000 feet

Source: San Francisco RPD; 2010 Census

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Figure 4: Acres of Park per 1,000 Adjacent Residents by Block

San Francisco Infrastructure Level of Service Analysis

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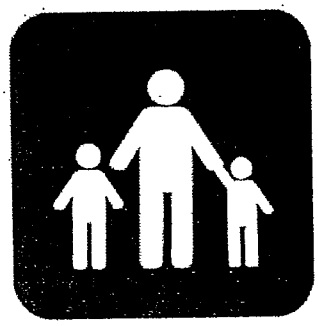
5. CHILDCARE FACILITIES



While the City does not own or operate childcare facilities, the City does work – through the Human Services Agency (HSA) and the San Francisco Childcare Planning and Advisory Council (CPAC) – to ensure that a sufficient number of facilities are provided to meet demand. Without being directly responsible for facility provision, San Francisco, like a number of smaller California cities such as Berkeley, Santa Monica, and Palo Alto, recognizes childcare as an important community-serving necessity and considers childcare in their needs assessment of community facilities. The City's involvement includes helping acquire funds for operations and contributing municipal funds for the complex patchwork of childcare subsidies for children of low-income families, as well as issue and record licensing for childcare facilities. Additionally, CPAC is charged with counseling policy-makers, planners, and funders about the needs of childcare in San Francisco. In terms of capital investment, the City helps acquire funds for facility construction. Given the City's capital investment, childcare infrastructure merits discussion as a City infrastructure component. This section will discuss childcare in San Francisco, propose two metrics, and evaluate childcare relative to the metrics. The policies referenced in this section are noted in Table 10 and appended for information.

Table 10. Key Childcare Facility Guiding Policy Documents

Policy Document	Issuing Department	Year	Document Status	Key Contributions
San Francisco Child Care Needs Assessment	San Francisco Child Care Planning and Advisory Council (CPAC)	2007	Final report	• Childcare provision by geography • Demand by low-income households (under 70% SMI)
San Francisco Citywide Plan for Early Care and Education and Out of School Time		May 2012	Final report	• Summary of childcare provision and areas of need

Source: AECOM, 2013

BACKGROUND

In San Francisco, through HSA, CPAC and various city agencies, the importance of childcare, particularly for young children, is readily recognized. Childcare differs depending on the age of the children, and typically children are divided into three age brackets: infants / toddlers, preschoolers, and school-age children. The City

defines infants / toddlers as children aged 0 to 2, preschoolers as children aged 3 to 5, and school-age children as children aged 6 to 14.[33]

Childcare provision can be divided into categories as well: licensed childcare and unlicensed childcare. Unlicensed childcare can be more formal care, like programs through boys and girls clubs and RPD, or more informal care, like stay-at-home parents, nannies, and grandparents.[34] Unlicensed childcare is largely beyond the purview or control of the City.

Licensed childcare has two forms, namely childcare centers and family childcare homes (FCCH). Centers are institutions that provide childcare in a childcare facility – which is often within a commercial building. Typically, centers care for a large number of children, divide them into age groups, and staff each age group with appropriate childcare and early education professionals. FCCHs are private homes where the homeowner provides childcare. FCCH capacity is lower, with a maximum of 12 to 14 children. Typically, FCCHs care for a mixed-age group of children.

Because both centers and FCCHs require licensing from the City, and because the City only provides capital funding to licensed facilities, the discussion of City childcare will be confined to licensed childcare. Furthermore, since school-age care is largely provided within schools – that is, facilities built by the school district (a legally separate public entity) and facilities generally not expanded for childcare independent of school growth – the discussion of City childcare will focus only on infant / toddler care and preschooler care.

Infant / toddler care is relatively under-provided as a service. CPAC's 2012 report, the *San Francisco Citywide Plan for Early Care and Education and Out of School Time,* indicates that the greatest unmet childcare need is for infant and toddler care.[35] The cost of infant / toddler care is expensive due in part to the high staff-to-infant ratio requirements. Preschool care is more adequately supplied than infant / toddler care, in part due to Proposition H, a Charter Amendment passed in 2004 to fund preschool care.[36] The aim of Proposition H is to provide quality, accessible preschool care to all four-year-olds – the so-called *Preschool for All* (PFA) movement.[37]

Note that demand for childcare comes primarily from city residents, including those who work within the city and those who work outside of the city. A lesser portion of childcare demand is also generated by non-residents who work within San Francisco. A portion of San Francisco employees, who live in, and commute from, the greater Bay Area, bring their children into the city for childcare. Generally, childcare demand is calculated by estimating the pool of children requiring licensed childcare, based on labor force participation rates and an estimated proportion of parents who use formal licensed care. Detailed childcare demand calculations are included in the appendix (Childcare Demand Calculations). **All childcare demand values used in this section are based on the calculations included in the appendix.**

[33] The three category break-downs –infants (0-2), preschoolers (2-5) and school age children (6-13) – were used in the 2008 *Citywide Development Impact Fee Study Consolidated Report* prepared for the Controller's Office.
[34] Dobson, Graham. Message to the author. 14 May 2013. Email.
[35] United States. Office of Early Care and Education. San Francisco Child Care Planning and Advisory Council (CPAC). "San Francisco Citywide Plan for Early Care and Education and Out of School Time." CPAC, 2012. Print.
[36] San Francisco Public Schools. "Public Education Enrichment Fund (PEEF)." Web. 22 Jul. 2013. http://www.sfusd.edu/en/about-sfusd/initiatives-and-plans/voter-initiatives/public-education-enrichment-fund.html
[37] PFA is supported federally by Obama's PFA initiative in the 2014 budget. Several studies complement the universal preschool initiative, showing that preschooled children tend to score higher on tests and attain higher education levels.

CASE STUDY COMPARISON: PROVISION AND METRICS

Considering childcare as infrastructure is a relatively new policy direction (in comparison to streets and sewers, for example), it is less frequently addressed directly by city policies. In a survey of case study cities, only Vancouver indicated a City-led commitment to increasing the available childcare provision by a quantified number of slots (150 spaces[38]) (Table 12). A number of California cities, however, also consider the provision of childcare as an important community asset, including Berkeley, Santa Monica, and Palo Alto.[39]

Vancouver currently is able to serve 19 percent of its total child population, although this statistic does not account for childcare demand. San Francisco is able to serve 37 of its demand for licensed infant and toddler child care and 99.6 percent of its demand for licensed preschooler childcare (Table 11).

Table 11. Current LOS Provision Comparison – Childcare

San Francisco[1,2]	Vancouver
• 2,951 licensed childcare spaces for infants / toddlers (age 0-2) • 14,661 licensed childcare spaces for preschoolers (age 3-5) • Serves 37% of demand for licensed infant / toddler (age 0-2) spaces • Serves 99.6% of demand for licensed preschooler (age 3-5) spaces • Not provided by the City	• 53 Childcare facilities • 19% of all children have access to public care

Source: Various city agencies

1. Only select cities are included (see Table 30 for additional cities).
2. Refer to the appendix (Childcare Demand Calculations) for detailed childcare demand calculations.

Table 12. City LOS Goals Comparison - Childcare

San Francisco[1]	Vancouver
• No explicit policy goal or LOS metric	• 500 new spaces by 2014

Source: Various city agencies

1. Only cities with relevant LOS metrics are included (see Table 31 for additional cities).

CHILDCARE LOS METRICS

Two metrics were identified to measure childcare LOS provision:

[38] Canada. City of Vancouver. "2012-2014 Capital Plan: Investing in our City." City of Vancouver, n.d. Web. 22 July 2013. http://vancouver.ca/files/cov/capital-plan-2012-2014.pdf

[39] Although few cities have explicit, quantified goals for childcare provision, childcare is increasingly debated as an arena for public intervention. Non-parent care has become the norm in the US, and early childcare is, in essence, early childhood education. Quality childcare has been linked to developmental benefits, and societies at large benefit from the cognitive, linguistic, and behavioral competencies associated with high quality childcare. While a variety of studies link better early childcare with better school-preparedness, among other advantages, equitable distribution of childcare is a challenge because high-quality childcare is higher-cost and is, thus, often inaccessible to low-income families. While the economic and social justifications of public intervention in childcare remain an unresolved debate, the inclusion of childcare as an infrastructure item allows San Francisco to at least examine its provision, which incorporates some – although limited – public involvement. Reference: Vandell, Deborah Lowe and Wolfe, Barbara. "Child Care Quality: Does It Matter and Does It Need to Be Improved?" *Institute for Research on Poverty*, Special Report No. 78 (2000). Web. 19 Sept. 2013. http://www.irp.wisc.edu/publications/sr/pdfs/sr78.pdf

- Percent of infant / toddler (0-2 Years) childcare demand served by available slots
- Percent of preschooler (3-5 Years) childcare demand served by available slots

While most short-term LOS metrics target 2030, childcare short-term targets use 2020 as a target date instead. This is due to the changing age demographics projected by the California Department of Finance (P-3 projections). The population of children in the city is expected to continue to increase through 2020, after which it is expected to decline slightly. As such, 2020 is used as a target date so that near term childcare needs are met. The childcare metrics and demand projections may be revisited at reasonable intervals to ensure that the provision is still appropriate. Each of the metrics will be discussed in the following subsections.

Percent of Resident Infant and Toddler (0-2 Years) Childcare Demand Served by Available Slots

Table 13. Percent of Infant / Toddler Childcare Demand Served by Available Slots – LOS Provision and Targets

LOS Measure	Value	Source
Current Citywide Average	• With almost 3,000 slots, 37 percent of infant / toddler childcare demand can be accommodated in existing slots	• Michele Rutherford, Program Manager for San Francisco HAS [1] • AECOM's childcare demand estimates (refer to the appendix Childcare Demand Calculations)
Long-term Aspirational Goal	• Slots to accommodate 100 percent of infant / toddler childcare demand	• CPAC, OECE staff
Short-term Target	• Slots to accommodate 37 percent of infant / toddler childcare demand; the target is to maintain existing service levels	• CPAC, OECE staff

Note:
1. Michele Rutherford, Program Manager at HSA, noted 2,951 existing infant and toddler slots via email to Harriet Ragozin of KMA on 15 November 2013.

The City currently licenses almost 3,000 infant / toddler childcare spaces in San Francisco. The number of infants and toddlers needing licensed care in San Francisco is approximately 8,000. As a result, childcare slots are available for approximately 37 percent of the infant / toddler childcare demand.

As an aspirational LOS goal, the Office of Early Childcare and Education (OECE) would like to ensure affordable care for all resident infants and toddlers who require care. This ideal LOS is a practical impossibility, because OECE is not directly responsible for providing childcare spaces, because of financial and capacity constraints, and because exact demand for infant and toddler childcare is unknown. OECE can support childcare with capital funding of facilities, subsidies for slots, and operating regulations, but OECE does not directly build or operate facilities. Even if OECE did directly provide childcare spaces, the cost to provide care for all infants and toddlers would be prohibitive, especially given land costs in San Francisco and the commitment to keeping enrollment costs affordable.

A more realistic LOS target identified by the City (OECE staff) is to maintain the current provision level. The current number of spaces represents 37 percent of total infant and toddler childcare demand, and the City aims to maintain slots for 37 percent of infant and toddler demand into 2020.

Infrastructure Shortfall and Gap Analysis

No shortfall exists at the current time, given that the metric target suggests maintaining current provision into the future. By 2020, given population projections, there would be an additional new infant and toddler demand

for approximately 2,500 slots. Serving 37 percent of this demand, as per the level of service, would require approximately 940 additional slots to be provided.

Percent of Preschooler (3-5 Years) Childcare Demand Served by Available Slots

Table 14. Percent of Preschooler Childcare Demand Served by Available Slots – LOS Provision and Targets

LOS Measure	Value	Source
Current Citywide Average	• With almost 15,000 slots, 99.6 percent of preschooler childcare demand can be accommodated in existing slots	• Michele Rutherford, Program Manager for San Francisco HSA[1] • AECOM's childcare demand estimates (refer to the appendix Childcare Demand Calculations)
Long-term Aspirational Goal	• Slots to accommodate 100 percent of preschoolers	• CPAC, OECE staff
Short-term Target	• Slots to accommodate 99.6 percent of preschoolers; target is to maintain existing service levels	• CPAC, OECE staff

The City currently licenses just over 14,600 slots for preschool age children. The number of preschoolers needing licensed care in San Francisco is approximately 14,700. The available slots represent 99.6 percent of the preschool age childcare demand.

With Proposition H in California in 2004, and the more recent growing political precedent for the PFA initiative, the City aims to provide universal preschool. PFA, or universal preschool, means quality, affordable preschool within the City for all preschool age (4-year-old) children – not just those demanding childcare. This aspirational goal is tempered slightly to achieve a realistic goal of maintaining the existing service level, at 99.6 percent of preschooler childcare demand. Should a PFA initiative pass, the City (and/or the School District) may play an increasingly important role in preschool provision, likely becoming more involved in both the capital development and ongoing operations and maintenance support of such a program. Without such a mandated program, CPAC will continue to support existing and new providers through capital funding support to encourage slot development.

Infrastructure Shortfall and Gap Analysis

No shortfall exists at the current time, given that the metric target is based on maintaining the current provision into the future. By 2020, given population projections, there would be an additional new preschooler childcare demand for 2,256 slots. Serving 99.6 percent of this demand, as per the level of service, would require 2,247 additional preschooler childcare slots to be provided.

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6. STREETSCAPE AND PEDESTRIAN INFRASTRUCTURE

Streetscape and pedestrian infrastructure, like recreation and open space, is one of the infrastructure types that has received a significant amount of thought, public outreach, and organization from the City. This section will explore the components of streetscape and pedestrian infrastructure, such as sidewalk width, street trees, intersection safety, lighting, and bulb-outs, as potential metrics. However, given the data gaps and complexities of these streetscape components, and because streetscape and pedestrian infrastructure does not cover a standardized set of infrastructure facilities, a proxy metric of improved sidewalk square footage per service population is developed. The policy documents referenced in this section are noted in Table 15, and appended.

Table 15. Key Streetscape and Pedestrian Infrastructure Guiding Policy Documents

Policy Document	Issuing Department	Year	Document Status	Key Contributions
San Francisco Better Streets Plan (BSP)	Planning Department	December 2010	Adopted	• Overview of recommended streetscape and pedestrian infrastructure elements • Sidewalk width recommendations by street typology • Street tree spacing recommendation • Lighting provision recommendations
Financing San Francisco's Urban Forest	DPW, Planning Department	October 2012	Final report	• Survey of existing street trees • Street tree growth plan
WalkFirst	DPH, SFMTA, Planning Department, San Francisco County Transportation Authority	October 2011	Draft policy to be included in update of Transportation Element of the General Plan	• High-injury density corridor maps and scoring • Pedestrian improvement prioritization

Source: AECOM, 2013

BACKGROUND

The 2010 San Francisco Better Streets Plan (BSP), along with Section 2.4.13 of San Francisco's Public Works Code, articulates the concept of "complete streets" for San Francisco.[40] With guidelines for the design of the pedestrian environment, the BSP puts forward streetscape specifications which balance the needs of all street users. Safety, creation of social space on the sidewalk, and pedestrian aesthetic are broadly the three motivators underlying the BSP recommendations. Key components identified in the BSP include sidewalk widths, street trees, intersection safety, street lighting, and bulb-outs. With the exception of sidewalk width, only limited data is available for each of these elements, allowing for an incomplete measure of their provision.

Sidewalks represent the foundation of pedestrian infrastructure, providing a path of travel and a canvas for place-making. The width of the sidewalk informs the opportunities: wider sidewalks affect pedestrian capacity, pedestrian comfort, and sidewalk amenities, affording more space for landscaping and other streetscape elements. The BSP provides clear direction on sidewalk widths for various street types, providing both a minimum width and a recommended width. Minimum sidewalk widths range from 6 feet on alleys, to 12 feet on park edge streets. Currently, roughly 91 percent of all city sidewalks meet the minimum width cited in the BSP.[41] By comparison, the recommended widths range from 9 feet on alleys to 24 feet on park edge streets. Currently, roughly 75 percent of all city sidewalks meet the recommended BSP width. While neither the minimum nor recommended width is always practically achievable given other operational constraints of particular streets, these metrics provide a reasonable census of the City's current sidewalk infrastructure.

Street trees are the archetypical street landscaping element and contribute to the pedestrian environment in a number of ways. Tree-lined streets are perceived as more narrow, which slows driving speeds along the street thus impacting pedestrian safety. As well as calming traffic, tree-lined streets provide an enhanced urban aesthetic which can be reflected in increased property values of adjacent lots. Trees also shade the sidewalk and mitigate urban heat island effect. According to data from the Department of Public Works (DPW), there are currently approximately 105,000 trees in the right-of-way in San Francisco planted along more than 1,000 centerline miles of streets. DPW targets planting 55,000 new street trees by 2030, resulting in 160,000 total street trees.[42] As a point of comparison, Vancouver, with a land area of roughly equal size to San Francisco, currently has an estimated 140,000 street trees and plans to plant an additional 150,000 trees by 2020.[43] Similarly, New York City has an ambitious Million Trees NYC program which aims to add an additional one million trees to the city's urban forest over the next decade.[44]

Intersections represent one of the most significant risks to pedestrian safety. Injury and collision records at intersections can be used to determine high injury intersections. San Francisco's *WalkFirst* initiative, developed by the San Francisco Department of Public Health (DPH), defines so-called "high injury" corridors, based on

[40] Complete Streets are defined as streets which "are safe, comfortable, and convenient for travel for everyone, regardless of age or ability – motorists, pedestrians, bicyclists, and public transportation riders." Metropolitan Transportation Commission, "MTC One Bay Area Grant: Complete Streets Policy Development Workshop." 16 October 2012. Section 2.4.13 of San Francisco's Public Works Code outlines San Francisco's complete streets policy, including the construction of transit, bicycle, stormwater, and pedestrian improvements. Pedestrian environment improvements include sidewalk lighting, pedestrian safety measures, traffic calming devices, landscaping, and other pedestrian elements listed as defined in the Better Streets Plan.

[41] AECOM internal analysis based on DPW database of sidewalk widths. Note that in some instances, given geometric or other constraints, some sidewalks may not be able to meet BSP minimum widths – therefore 100 percent compliance with the BSP sidewalk widths may not be possible. Note also that data is not available for all city streets. This study recommends further data collection.

[42] AECOM, "Financing San Francisco's Urban Forest – The Benefits and Costs of a Comprehensive Street Tree Program." October 2012. Print.

[43] Canada. City of Vancouver. "Greenest City 2020 Action Plan." City of Vancouver, 2012. Web. 22 Jul. 2013. http://vancouver.ca/files/cov/report-GC2020-implementation-20121016.pdf

[44] Million Trees NYC. *Million Trees NYC.* MTNYC, 2013. http://www.milliontreesnyc.org/html/home/home.shtml

spatial injury data. In DPH's approach, high injury corridors, defined by number, severity, and density of injuries serve as a proxy for identifying intersections that operate at a deficit. These high injury corridors, and their associated 800 intersections, account for 6 percent of San Francisco's streets, but over 60 percent of all pedestrian injuries.[45] Where risks to pedestrians are high, a variety of treatments can be assessed to ameliorate the risk, including installing pedestrian signals, constructing bulb-outs, or adding bollards. Pedestrian safety upgrades would need to be individualized by intersection, given the unique dynamics and geometry of each intersection.

Street lighting is a major contributor to both pedestrian comfort and sidewalk safety. Security, as well as the perceived sense of security, is much higher on well-lit sidewalks than on poorly-lit or unlit sidewalks. Adequate lighting makes pedestrians feel more comfortable while walking at night, and reduces crime along the street. As well as improving safety, street lighting supports civic nighttime sidewalk activity, such as late-night street markets. However, no data exists on either the sidewalk lighting quality throughout the City or the appropriate spacing to achieve adequate light levels along sidewalks. With this data gap, no analysis of sidewalk lighting in the City can be performed.

Bulb-outs are extensions of the sidewalk into the parking lane, either at corners or mid-block locations. Bulb-outs narrow the roadway and extend the pedestrian space, which simultaneously slows traffic by creating a bottleneck, shortens crossing distance, and increases pedestrian visibility. Each of these effects increases pedestrian safety. Bulb-outs can also create space for more landscaping, street furniture, or high pedestrian volumes. The installation of bulb-outs needs to be assessed on a case-by-case basis; not all locations are suitable for bulb-outs, considering traffic characteristics (particularly the turning radii of large vehicles). While general bulb-out locations are recommended in the BSP, this study recommends further mapping of existing and proposed bulb-out locations. No blanket provision of bulb-outs would be appropriate, and currently no data exists to support analysis of bulb-outs.

CASE STUDY COMPARISON: PROVISION AND METRICS

In a review of LOS metrics and goals for other cities, most City metrics regarding streetscape and pedestrian infrastructure focus on pedestrian access (i.e. availability of sidewalks and trails), the quality of the pedestrian experience, design and qualitative improvement, and measurement of mode share splits (Table 16 and Table 17). Some cities, like Portland and Vancouver do provide quantitative measures of provision, which help to evaluate progress towards their goals. In policy documents (particularly the BSP), San Francisco agencies provide few quantitative goals regarding streetscape and pedestrian infrastructure, but extensively discuss design guidelines and streetscape quality.

Table 16. Current LOS Provision Comparison – Streetscape and Pedestrian Infrastructure

San Francisco [1]	Minneapolis	Philadelphia	Portland	San Jose	Vancouver
• 105,000 existing street trees • 115 million square feet of sidewalk space	• 92% of street have sidewalks	• 131,000 existing street trees • 55 trees / mile of city street	• 17% of canopy coverage over streets • 1,900 miles of sidewalk	• N/A	• 138,000 street trees • 2,400 km of sidewalks

Source: Various city agencies

1. Only select cities are included (see Table 30 for additional cities).

[45] Lily Langlois, Planner with the San Francisco Planning Department in an email dated December 12, 2013.

Table 17. City LOS Goals Comparison - Streetscape and Pedestrian Infrastructure

San Francisco [1]	Minneapolis	Philadelphia	Portland	San Jose	Vancouver
• Few quantitative goals • Significant design guidelines and qualitative objectives • 160,000 street trees by 2030	• Few quantitative goals • Qualitative objectives, and design guidelines	• Increase walk mode share from 8.6% to 12% by 2020 • Keep 70% of assets in good repair • Increase tree coverage to 30% (by adding 300,000 trees by 2025)	• Neighborhoods must maintain citywide average for proportion of arterials with sidewalks • 35% of canopy coverage over streets • 150 additional miles of trails	• 100% of non-rural portions of San Jose should have a continuous sidewalk network • Every street should be complete and accommodate pedestrians and bikes	• Increase pedestrian mode share (66% of all trips to be by bike, walk, or transit by 2040) • By 2014, 2km of additional sidewalk

Source: Various city agencies

1. Only cities with relevant LOS metrics are included (see Table 31 for additional cities).

STREETSCAPE AND PEDESTRIAN INFRASTRUCTURE LOS METRIC

Because a complete streetscape environment is made up of many elements (street trees, bulb-outs, lighting, pedestrian signals, etc.) and because data for many of these elements is generally unavailable, an alternative proxy metric has been developed to evaluate current and future provision of streetscape and pedestrian infrastructure. The proxy metric used in this analysis is:

- Square feet of improved sidewalk per service population unit[46]

'Improved sidewalk' is a term that encompasses sidewalk space and any amenities in that space, such as lighting, street trees, bulb-outs, and sidewalk furniture. While the proscription for streetscape elements is not uniform across San Francisco (i.e. the BSP calls for different streetscape and pedestrian infrastructure improvements depending on the site considerations, the street type, the traffic patterns, and so on), the intent of the BSP is to improve all San Francisco streetscape. Therefore, the basic square footage of sidewalk is denoted 'improved sidewalk' to reflect the investments the City is committed to make in the pedestrian right-of-way in terms of sidewalk widening, bulb-outs, signalized crosswalks, pedestrian lighting, trash cans, benches, trees, and so on.

Because data for provision of streetscape elements is generally unavailable and because the BSP does not clearly delineate improvement plans for every streetscape site and condition, a precise definition of 'improved sidewalk' is unavailable. The metric is discussed in the following sub-sections.

[46] For streetscape and pedestrian infrastructure, service population is calculated by assigning residents one point, and employees 0.5 points. For a more complete definition of service population see the Service Population Definition in the Appendix (p.83). Refer also to the companion report, *San Francisco Citywide Nexus Analysis* (March 2014), and its appendix report, *San Francisco Citywide Nexus Analysis – Service Population Concept Memorandum* (September 24, 2013) for more detail.

Square Feet of Improved Sidewalk Space

Table 18. Square Feet of Improved Sidewalk per Service Population Unit – LOS Provision and Targets

LOS Measure	Value	Source
Current Citywide Average	• 103 square feet of sidewalk per service population unit	• Planning Department and DPW data (see Table 29)
Long-term Aspirational Goal	• 88 square feet of improved sidewalk per service population unit (improve all existing sidewalk provision)	• Planning staff
Short-term Target	• 88 square feet of improved sidewalk per service population unit (improve all existing sidewalk provision)	• Planning staff

Citywide, San Francisco currently supplies 115 million square feet of sidewalk – or 103 square feet of sidewalk per service population unit. The LOS ranges greatly across different neighborhoods. The Financial District provides only 25 square feet of sidewalk per service population unit, while the West of Twin Peaks neighborhood provides as much as 483 square feet of sidewalk per service population unit. Noe Valley, at 138 square feet per service population unit is more representative of the citywide average (Figure 5). Implicitly, this metric acknowledges that streets with higher service population densities require more pedestrian infrastructure than streets with lower service population densities. Note that this approach, based on service population density, provides a good indicator of where deficiencies likely exist, but a block-by-block analysis would be needed to definitively assess sidewalk provision and deficiency.

Both the long-term LOS goal and the short-term LOS target are to maintain *and improve* the current 115 million square feet of streetscape and pedestrian infrastructure. Given population growth between now (2013) and 2030, the 2030 provision of streetscape and pedestrian infrastructure would be 88 square feet of improved sidewalk per service population unit.[47]

Infrastructure Shortfall and Gap Analysis

The short-term (2030) LOS target is to improve all San Francisco streetscape. As such, there is no existing shortfall, but rather a commitment by the City, in accordance with the BSP, to invest in San Francisco streetscape and pedestrian infrastructure.

It should be made clear that this metric is intended to help set a framework for continued streetscape infrastructure evaluation. To develop this metric into a more robust representation of pedestrian and streetscape infrastructure provision in San Francisco, this report recommends collecting additional data on the larger suite of streetscape elements on a block-by-block basis. Such analysis would help ensure that

[47] Improving the 115 million square feet of streetscape and pedestrian infrastructure, given population growth through 2030 to 1,301,049 service population units, yields a LOS of 88 square feet per service population. Population and employment projections taken directly from the San Francisco Planning Department 2013 projections from Aksel Olsen, Planner/Geographer in Citywide Information and Analysis Group, received May 14, 2013 (Table 29). Note that in some streetscape and pedestrian infrastructure improvement projects, such as bulb-out construction or sidewalk widening, square footage will be added to the existing 115 million square feet of sidewalk space footage – although the new square footage from bulb-outs and the select instances of sidewalk widening will likely contribute only a small additional amount of additional streetscape square footage. In the absence of data on the estimated amount of additional streetscape square footage to be constructed, this metric assumes that streetscape improvements will maintain the existing square footage. The consultant recommends collecting robust data on streetscape square footage across the City, considering both existing square footage, projected square footage (via planned streetscape improvement projects), and actual post-construction square.

streetscape development in San Francisco contains all of the components important for a safe, walkable, and healthy streetscape. Defining 'improved sidewalk' with quantitative measures of lights per block, bulb-outs per intersection type, pedestrian signalization per intersection type, and so on, and collecting data per street segment, would allow a more precise definition of streetscape and pedestrian LOS. The BSP demonstrates the City's commitment to improving streetscape and pedestrian infrastructure (although the precise set of improvements will differ across projects, locations, and street types)[48], and AECOM recommends further data collection and more precise definition of streetscape and pedestrian infrastructure elements to facilitate BSP implementation. With more information, a more precise LOS metric can be defined that can better track the effect of streetscape improvement projects on the streetscape and pedestrian infrastructure provision.

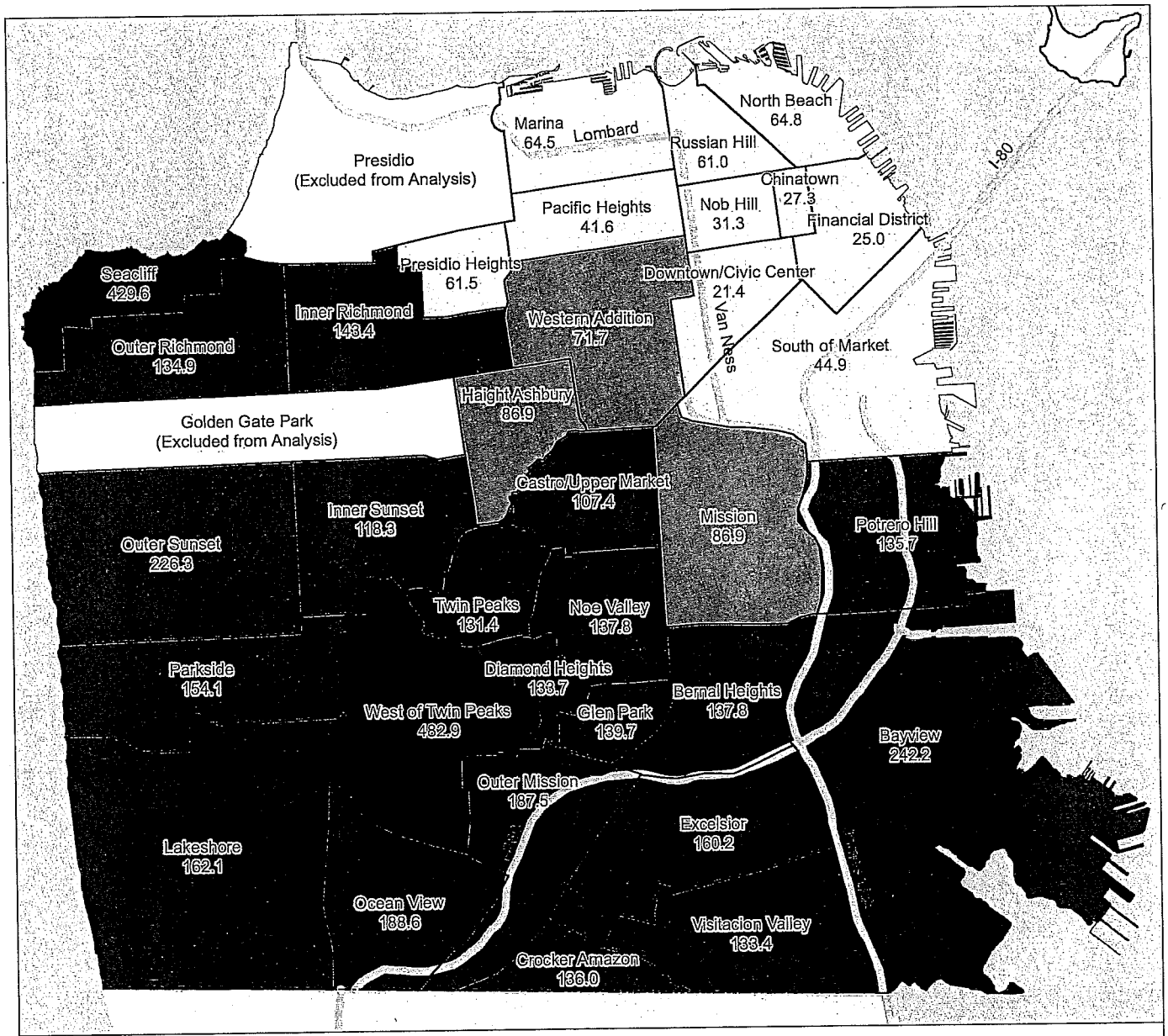
PROPOSED OPPORTUNITIES FOR FURTHER STUDY

The following studies were identified in the LOS metric development process as potential next steps in the continued refinement of the City's streetscape and pedestrian infrastructure provision evaluation:

- Inventory of sidewalk improvement elements on a block-by-block basis
- Collection of sidewalk width data for missing 25 percent of streets
- Collection of sidewalk width data for both sides of streets
- Collection of more thorough street tree data including data for missing trees and mapping of street trees in medians
- Mapping of existing bulb-out locations
- Mapping of recommended and required bulb-out locations per the BSP street typologies
- Collection of data on pedestrian lighting, including locations and illumination
- Definition of a sidewalk lighting standard in terms of spacing of light poles

This additional data would allow the City to evaluate provision and distribution in greater detail.

[48] In some cases, given the site conditions, traffic patterns, built environment constraints, street type, and existing conditions, the streetscape and pedestrian infrastructure improvements may be a Do Nothing scenario.



Citywide Sidewalk Provision (2013)	
Total Sidewalks* (Million Square Feet)	115
Total Improved Sidewalks (Square Miles)	4.1
LOS Metric - Sqare Feet of Sidewalk Per SPU**	
Current Citywide Average (2013)	103
Short-term target (2030) - Sq. ft. of *Improved* Sidewalk Per SPU	88
Existing Citywide Shortfall (Square Feet)	-

* Based on sidewalk data from DPW. Where data gaps exist, AECOM assumed sidewalks on only one side of the street and sidewalks with the average sidewalk width (10ft).

** Service Population Unit

*** Improved sidewalk denotes sidewalk that, although not consistent or uniform in provision, has some pedestrian amenities (trees, lighting, bulb-outs, etc), rather than just pavement.

LEGEND

- County Boundary
- Neighborhoods
- Highways

NORTH

Feet
0 3,000 6,000

Scale: 1 inch = 6,000 feet

Source: DPW, Planning

Sidewalk Provision (in square feet per service population unit)

- Below 65
- 65 - 103 (Citywide average, 2013)
- 103 - 300
- Above 300

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Figure 5. Square Feet of Sidewalk Area per Service Population Unit (2013)

San Francisco Infrastructure Level of Service Analysis

February 2014

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7. BICYCLE INFRASTRUCTURE

Bicycle infrastructure complements the other transportation modes within the city, and San Francisco is working to increase the number of trips taken by bike and the number of people riding bikes. The following section will give background on the bicycle network in San Francisco, propose targets for bicycle network provision, and evaluate these targets. The policies referenced in this section are included in Table 19 below. This section relies heavily on the SFMTA Bicycle Strategy.[49]

Table 19. Key Bicycle Infrastructure Guiding Policy Documents

Policy Document	Issuing Department	Year	Document Status	Key Contributions
San Francisco Bicycle Master Plan	SFMTA	June 2009	Adopted	• Overview of existing bicycle network • Overview of bicycle network objectives and planned development
SFMTA Bicycle Strategy	SFMTA	December 2012	Internal policy document; basis for 2014 CIP project list (pending adoption of CIP project list in April 2014)	• Overview of existing bicycle network • 3 potential scenarios for expansion of the bicycle network

Source: AECOM, 2013.

BACKGROUND

The City currently manages roughly 216 miles of bicycle network on the City's 1,030 centerline miles of road, with a bicycle mode share of approximately 3.5 percent.[50] In the past, the bicycle network has been classified according to the traditional Class I, II, III system which distinguishes bike routes by their decreasing level of separation from vehicle traffic. In consultation with the SFMTA, this traditional engineering classification system

[49] San Francisco Municipal Transportation Agency, "SFMTA Bicycle Strategy." January 2013. Print. While this document is still a draft, SFMTA staff directed the consultant to use it because SFMTA is developing the CIP project list to be put forward for board approval in April 2014 based on this document. Although no plans exist to take the 2013 Bicycle Strategy to the board for adoption, the project list derived from it will be taken to the board for CIP approval in April 2014.
[50] Mode share represents the percentage of all trips made by a particular mode – i.e. 3.5 percent of all trips are made by bicycle.

was deemed somewhat inadequate to describe all San Francisco bikeway types, since San Francisco is building new types of bikeway infrastructure that do not fit in the traditional classifications.[51]

Instead of the traditional classifications, San Francisco has developed its own Comfort Index to rate the bike network.[52] The Comfort Index is a four-tiered categorization (LTS 1 to 4) that relates the accessibility of the bikeway to different rider skill levels (Figure 6): LTS 1 represents bikeways that any bicyclists would find comfortable including young children, seniors, disabled persons, and beginner cyclists; LTS 2 represents bikeways comfortable for most adults and experienced children; LTS 3 represents bikeways comfortable for intermediate and experienced adult riders, termed "enthusiastic and confident"; and LTS 4 represents bikeways comfortable only for "strong and fearless" riders. The classification is based on a variety of factors including proximity to rail, speed of adjacent traffic, type of existing facility, interaction with express buses, and proximity to highway on-ramps. While the existing bicycle network is approximately at full build-out, per the 2009 *Bicycle Master Plan*, SFMTA has expressed plans to upgrade existing routes to more "comfortable" class levels.

A typical measure of bicycle transportation is bicycle mode share. Mode share measures the percentage of all transportation trips that use a given "mode" – in this case, the percentage of all trips made by bicycle. As noted above, San Francisco currently has a bicycle mode share of approximately 3.5 percent, which it aims to increase to between 8 and10 percent by 2018. While useful to evaluate how people are traveling, as a metric, mode share has no direct connection to infrastructure. A percentage point of mode share cannot defensibly be equated to miles of bikeway. Instead, in the Bike Strategy, SFMTA has identified the bike infrastructure necessary to move towards the City's target mode share. Note that the City has met the original planned provision of bicycle lanes in the 2009 *San Francisco Bicycle Plan* and is now working to improve the system and facilitate bicycle activity along the existing networks.

CASE STUDY COMPARISON: PROVISION AND METRICS

A review of LOS metrics and goals for other cities found that cities tend to evaluate their bicycle infrastructure provision either through the amount or length of bike lanes, or through a measurement of bicycle mode share (Table 20, Table 21). Some cities, such as Boston, Miami, and Philadelphia have also noted the importance of having, or working towards, some nationally-recognized bicycle status program. While San Francisco has developed strategic bicycle plans tailored to increase both quantity and quality of the city's bicycle network, the SFMTA does not have explicit LOS goals.

[51] Heath Maddox, Senior Transportation Planner at SFMTA, via email received May 8, 2013.
[52] San Francisco's Comfort Index is modeled off of the Level of Traffic Street (LTS) designation developed by the Mineta Transportation Institute.

Table 20. Current LOS Provision Comparison – Bicycle Infrastructure

San Francisco [1]	Boston	Miami	Philadelphia	Portland	Vancouver
• 216 miles of bike network • Current bicycle mode share of 3.5%	• Silver designation from the League of American Bicyclists' Bicycle Friendly Community program • Over 100 miles of bike network	• 17.12 miles of bike network • 1.6% of street network	• Approximately 20% of streets have bike network (2012) • 128 miles of bike network (2009)	• 230 street miles of bike network	• 280 miles of bike network • 100% of buses are bike-accessible

Source: Various city agencies

1. Only select cities are included (see Table 30 for additional cities).

Table 21. City LOS Goals Comparison – Bicycle Infrastructure

San Francisco [1]	Boston	Miami	Philadelphia	Portland	Vancouver
• Bicycle Strategy Plan and network infrastructure improvements • Mode share increase from 3.5% to 8%-10%	• 417 miles at build-out • 10% of all trips by bike by 2025 • Plan to cover the entire city and connect to regional network	• 280 miles by 2030 (33% of street network with bikeways) • Obtain Bike Friendly City status	• Reduce bike accidents 50% by 2020 • Increase bike mode share from 1.6% to 6.5% • League of American Bicyclists "Platinum" (2013) • 70% of assets in good repair • Reduce VMT by 10%	• 3% bike commuting trips • 630 miles of total bike network by 2030 • All areas must maintain citywide average for bike lane miles per 1,000 households	• Increase bike mode share • Expand "all ages and abilities" bike network • Provide additional bike parking • 328 total miles in bike network as near-term goal
• 0.27 miles of bicycle network/ 1,000 residents	• 0.68 miles of bicycle network/ 1,000 residents	• 0.70 miles of bicycle network/ 1,000 residents	• 0.36 miles of bicycle network/ 1,000 residents	• 1.08 miles of bicycle network/ 1,000 residents	• 0.54 miles of bicycle network/ 1,000 residents

Source: Various city agencies

1. Only cities with relevant LOS metrics are included (see Table 31 for additional cities).

BICYCLE INFRASTRUCTURE METRICS

In place of LOS metrics, SFMTA prepared a list of infrastructure improvement targets, in line with what has been developed as part of the Bicycle Strategy. The following four infrastructure facilities make up the critical elements of the most recent Bicycle Strategy:

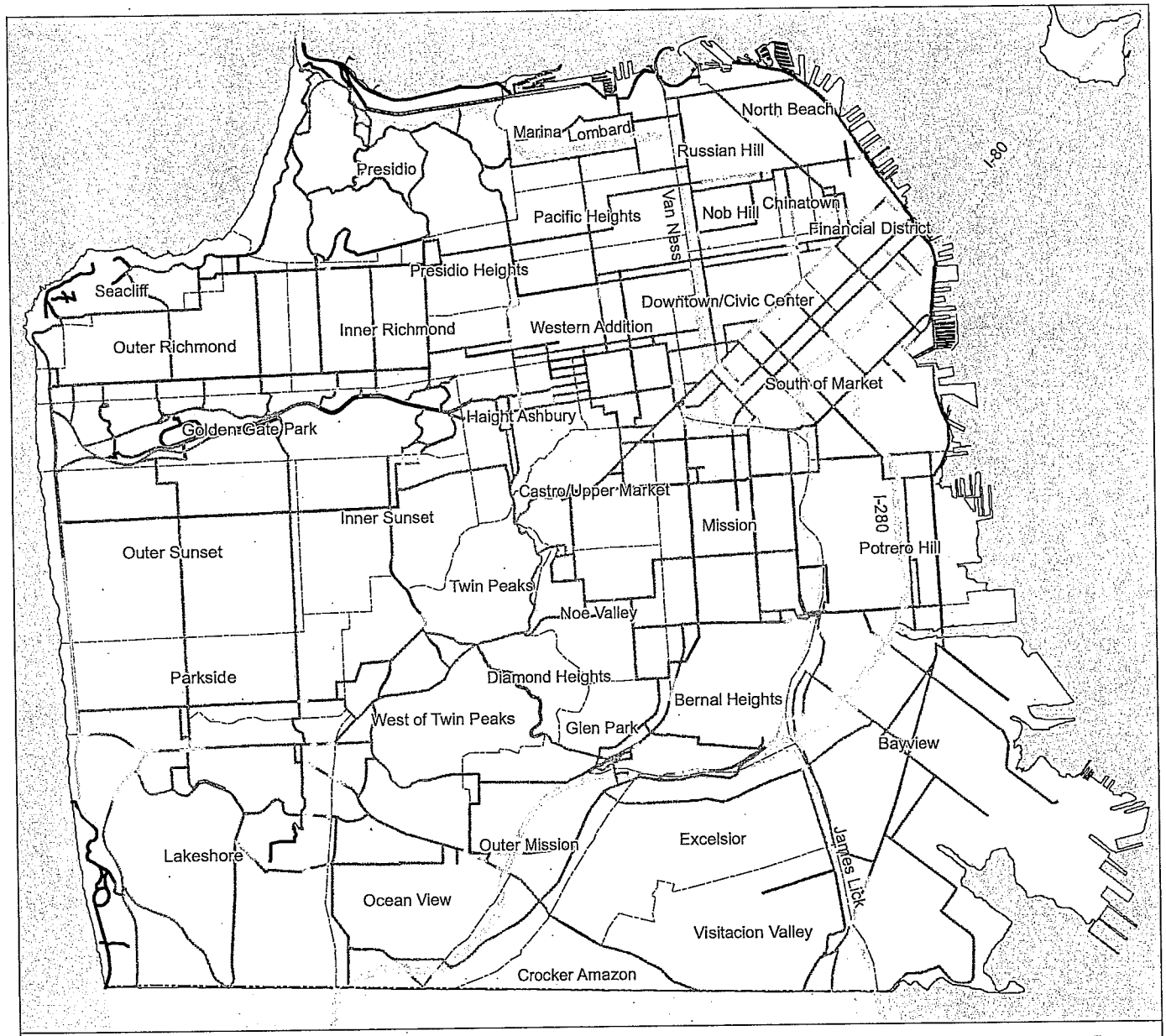
- Premium (LTS 1 and 2) network miles
- Upgraded intersections
- Bicycle parking spaces
- Bicycle share program (bikes and accompanying stations)

San Francisco's goal for bicycle transportation is to achieve 8 to 10 percent mode share. The Bicycle Strategy, created through the diligent and thoughtful work of the SFMTA, outlines the steps SFMTA must take to achieve

their goal. For this reason, no new bicycle infrastructure metrics are proposed; instead, the scenarios proposed by SFMTA are adopted as targets for bicycle infrastructure, as the means to achieve their mode share end.

For each of the infrastructure elements, the long-term aspirational goal is based on SFMTA's *System Build-out Scenario*, as outlined in the SFMTA Bicycle Strategy, which represents the full realization of the desired bike network for San Francisco. This scenario would cost over $600 million, increasing bicycle mode share to more than 15 percent. The short-term targets are based on the "*Bicycle Plan Plus" Scenario* and represent a more reasonable goal by 2018. The targets are expected to cost roughly $60 million by 2018, helping to increase bicycle mode share to between 8 and 10 percent.[53]

[53] United States. San Francisco Municipal Transportation Agency (SFMTA). "SFMTA Bicycle Strategy." SFMTA, Dec. 2012. Print.



Bicycle Network Provision (2013)	
Total Bicycle Network (Miles)	216
LTS 1	16
LTS 2	35
LTS 3	121
LTS 4	44
LOS Metric - % Premium Facilities* within Bike Network	
Current Citywide Average (2013)	24%
Short-term Target (2018)**	27%
Projected Citywide Shortfall (Miles of Bikeway)	10

* Premium facilities are bikeways of class LTS 1 or LTS 2

** Percentage accounts for 10 new miles of planned bikeways

LEGEND

- County Boundary
- Neighborhoods
- Highways

NORTH

Feet: 0 3,000 6,000

Scale: 1 inch = 6,000 feet

Source: San Francisco MTA

Comfort Level According to San Francisco's Comfort Index

- LTS 1 (Comfortable for all user groups)
- LTS 2 (Comfortable for most adults/experienced youth)
- LTS 3 (Comfortable for intermediate and experienced adults)
- LTS 4 (Tolerated only by the 'strong and fearless')

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Figure 6. Bicycle Network Provision by Comfort Index (2013)

San Francisco Infrastructure Level of Service Analysis

February 2014

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Table 22 summarizes the individual long-term infrastructure goals and short-term targets for each element.

Table 22. Bicycle Infrastructure – Network Provision and Targets

Infrastructure Measure	Value	Source
Premium Network Miles		
Current Citywide Provision	• 51 miles	• SFMTA Data (see Table 29)
Long-term Aspirational Goal	• 251 miles (200 additional miles)	• SFMTA Bicycle Strategy, p21, *System Build-out Scenario,*
Short-term Target (2018)	• 61 miles (10 additional miles)	• SFMTA Bicycle Strategy, p21, *Bicycle Plan Plus Scenario*
Upgraded Intersections		
Current Citywide Provision	• 3 intersections	• SFMTA Bicycle Strategy
Long-term Aspirational Goal	• 203 intersections (200 additional intersections)	• SFMTA Bicycle Strategy, p21, *System Build-out Scenario,*
Short-term Target (2018)	• 13 intersections (10 additional intersections)	• SFMTA Bicycle Strategy, p21, *Bicycle Plan Plus Scenario*
Bicycle Parking Spaces		
Current Citywide Provision	• 8,800 spaces	• SFMTA Bicycle Strategy
Long-term Aspirational Goal	• 58,000 spaces (50,000 additional spaces)	• SFMTA Bicycle Strategy, p21, *System Build-out Scenario,*
Short-term Target (2018)	• 12,800 spaces (4,000 additional space)	• SFMTA Bicycle Strategy, p21, *Bicycle Plan Plus Scenario*
Bicycle Sharing Program		
Current Citywide Provision	• 0 bicycles (and sharing stations)	• SFMTA Bicycle Strategy
Long-term Aspirational Goal	• 3,000 bicycles and 300 sharing stations (all net new)	• SFMTA Bicycle Strategy, p21, *System Build-out Scenario,*
Short-term Target (2018)	• 500 bicycles and 50 sharing stations (all net new)	• SFMTA Bicycle Strategy, p21, *Bicycle Plan Plus Scenario*

Infrastructure Shortfall and Gap Analysis

Assuming the proposed improvements take place between now (2013) and 2018, the City will achieve stated short-term targets. The city has built all of the proposed bike-miles in the 2009 *Bicycle Master Plan* and will now work towards the targets set by the Bicycle Plan Plus scenario in the Bicycle Strategy.

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8. TRANSIT INFRASTRUCTURE

Like bicycle and pedestrian infrastructure, transit infrastructure complements the other transportation modes within the city. San Francisco aims to increase transit's mode share.[54] The following section provides a background on San Francisco's transit infrastructure and reviews previously determined metrics and targets for transit network provision. The policy referenced in this section is noted in Table 23 below.

Table 23. Key Transit Infrastructure Guiding Policy Documents

Policy Document	Issuing Department	Year	Document Status	Key Contributions
San Francisco Transportation Sustainability Fee Nexus Study	SFMTA	March 2012	Draft report	• Transit performance metrics and targets (both transit crowding and travel time)

Source: AECOM, 2013

BACKGROUND

The SFMTA's 2012 *San Francisco Transportation Sustainability Fee Nexus Study* is an important guiding document for the evaluation of San Francisco's transit system. The evaluation of transit infrastructure defers to this report and its subsequent updates.

CASE STUDY COMPARISON: PROVISION AND METRICS

In a review of LOS metrics and goals for other cities, the most common measures of transit provision are percent mode share, ridership counts, transit load (crowding), and travel time (Table 24).

While these make helpful goals, none of the cities reviewed make their current provision of these metrics readily available (Table 24) making it difficult to evaluate how well they are currently providing transit infrastructure. In its *Transportation Sustainability Fee Nexus Study*, SFMTA measures two of these common metrics, which are directly applied in this study.

[54] Mode share represents the percentage of all trips made by a particular mode – in this case, the percent of all trips made by transit.

Table 24. Current LOS Provision Comparison – Transit

San Francisco[1]	Portland	San Diego	Vancouver
Travel Time			
• Average 33.7 minutes per transit travel time	• N/A	• Approximately 15% of transit trips shorter than 30 minutes (compared to 8% currently)	• N/A
Transit Crowding			
• 85% transit crowding target	• Transit load factor greater than 100% • 19% transit commuting trips	• Increased ridership and having an attractive, convenient transit system	• Increase transit mode share

Source: Various city agencies

1. Only cities with relevant LOS metrics are included (see Table 30 and Table 31 for additional cities).

TRANSIT LOS METRICS

The SFMTA's 2012 *San Francisco Transportation Sustainability Fee Nexus Study* is an important guiding document for the evaluation of San Francisco's transit system. Two key performance metrics are identified to measure the City's success in meeting its target LOS. While these two metrics were specifically applied to develop an appropriate nexus, SFMTA supports the use of the metrics for LOS evaluation as well. Because of the nature of transit travel in San Francisco, both of these metrics are calculated at the citywide level. The two metrics are:

- Transit crowding
- Transit travel time

Not only are the two metrics quantitatively evaluated by SF-CHAMP, the City's travel demand model, but together these two metrics measure the true impact of new development on the City's transit system.

Transit Crowding

Table 25. Transit Crowding – Network Provision and Targets

LOS Measure	Value	Source
Current Citywide Average	• N/A	• San Francisco Transportation Sustainability Fee Nexus Study, pp. 3-3 to 3-8; 5-7 to 5-9
Long-term Aspirational Goal	• N/A	
Short-term Target (2018)	• 85% transit crowding	

The transit crowding metric – also known as the transit system load factor – measures "transit capacity utilization," calculated as transit demand (ridership) as a percentage of capacity. The capacity of a transit

vehicle includes the total number of seats as well as additional standing room. *The current LOS provision is currently being developed and is not included in this report.*

The SFMTA uses a transit crowding of 85 percent to identify overcrowded conditions on a bus route or rail line at any given time. This LOS target was used in the transit nexus analysis to develop an appropriate fee level. As a point of comparison, Portland targets a transit system load factor of 100 percent.[55]

Infrastructure Shortfall and Gap Analysis

Individual route and existing citywide information is not available for this metric. *Additional information on the system-wide shortfall will be available once the transit system evaluation process currently underway is completed.*

Transit Travel Time

SFMTA uses transit travel time as useful metric to evaluate the transit system's performance. The metric helps account for impacts of development on the system, and is used in transit policy and planning. The metric is calculated by dividing total person transit time by total transit trips.

Table 26. Transit Travel Time – Network Provision and Targets

LOS Measure	Value	Source
Current Citywide Average	• 33.7 minutes per average travel time	• San Francisco Transportation Sustainability Fee Nexus Study, pp. 3-3 to 3-8; 5-9 to 5-11
Long-term Aspirational Goal	• N/A	
Short-term Target (2018)	• 33.6 minutes per average travel time	

As of 2010, the average system-wide transit travel time was approximately 33.7 minutes. This is a door-to-door measurement and includes walking to a transit stop, waiting for the vehicle, and walking from the stop to the destination.[56]

By 2030, SFMTA is aiming for an average transit travel time of 33.6 minutes, roughly the same as it now provides.

Infrastructure Shortfall and Gap Analysis

The transit travel time provided in 2010 was seen as adequate. However, in its 2012 *San Francisco Transportation Sustainability Fee Nexus Study*, SFMTA has identified a number of projects that must be built in order to sustain the LOS target put forth. These projects aim to address expected increased development and service population within San Francisco.

[55] United States. City of Portland. Portland Bureau of Transportation. "Transportation System Plan, Chapter 5 – Modal Plans and Management Plans." City of Portland, 4 May 2007. Web. 22 Jul. 2013. http://www.portlandoregon.gov/transportation/article/370479

[56] Cambridge Systematics, Inc., Urban Economics, et al. "San Francisco Transportation Sustainability Fee Nexus Study." March 2012. Print.

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9. SOCIOECONOMIC VULNERABILITY

While the metrics presented in this report intend to evaluate LOS and provisional distribution of the various infrastructure categories, the metrics are unable to consider all of the factors that might affect project prioritization. Evaluating socioeconomic indicators can be a useful tool to provide additional information about a neighborhood's general level of "vulnerability." Vulnerable populations often do not have the resources to access private amenities such as private transportation or private recreation facilities, creating a greater need for public facilities and services in these communities. For the purposes of this study, five socioeconomic indicators have been evaluated at both the tract and neighborhood level:

1. Unemployment rate
2. Household income
3. Age – Youth population (0-14)
4. Age – Elderly population (65+)
5. Minority population (>50% non-white)

The results of the individual socioeconomic indicators are presented by neighborhood in the Appendix (Table 32-Table 35).

In order to measure the overall vulnerability of a tract, these five indicators are consolidated, each receiving one point for the following measures. This point distribution assigns equal importance to each of the indicators. While this may over or under emphasize the importance of one of the indicators, it provides a starting point to evaluate neighborhoods. As a result, tracts receive a score from zero to five, zero being least vulnerable, and five being most vulnerable.

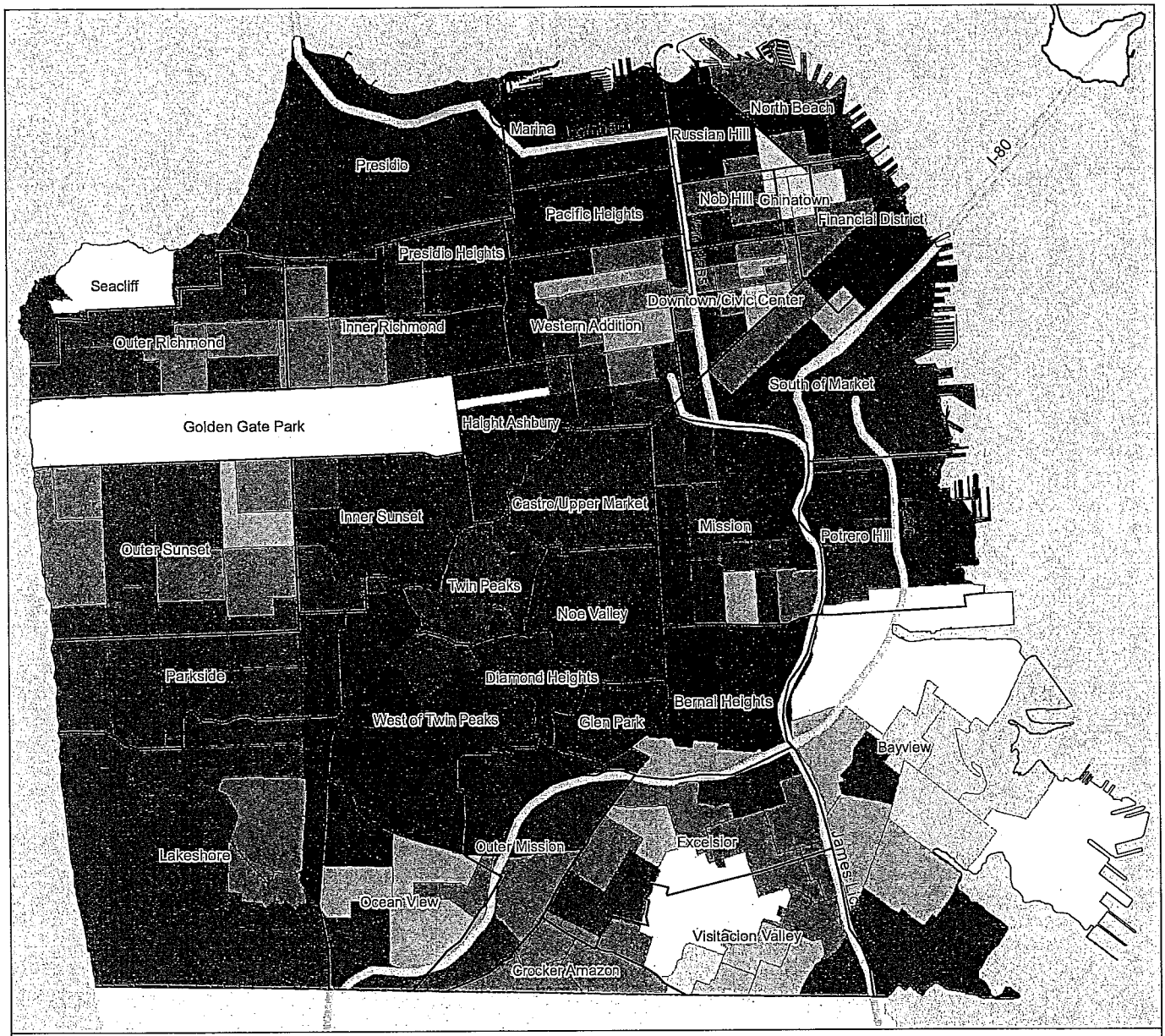
- **Unemployment rate** – Neighborhoods with civilian unemployment rates above 150 percent of the citywide average.[57]
- **Average household income** – Neighborhoods that have a greater share of households under 80 percent of the area median income (AMI) than the households in the city on average.[58]
- **Youth** – Neighborhoods whose youth (0-14) population as a percentage of total population is 150 percent of the ratio citywide.[59]

[57] In 2010, the citywide unemployment rate was 7 percent. One hundred and fifty percent of the citywide average is 11 percent (2010 ACS).
[58] With an average household size of 3.0 people, the citywide 80 percent AMI for 2010 was $71,550. Source: http://sf-moh.org/Modules/ShowDocument.aspx?documentid=4614
[59] In 2010, the citywide youth (0-14) rate was 11 percent. One hundred and fifty percent of the citywide average is 17 percent (Source: U.S. Census).

- **Elderly** – Neighborhoods whose elderly (65+) population as a percentage of total population is 150 percent of the ratio citywide.[60]
- **Minority** – Neighborhoods with greater than 50 percent non-white (minority) population by race.[61]

As highlighted in Figure 7, the City's most vulnerable tracts are disproportionately concentrated in Bayview, Excelsior, Visitacion Valley, and Chinatown neighborhoods. These areas may receive special consideration to ensure that their infrastructure needs are met.

[60] In 2010, the citywide elderly (65+) rate was 14 percent. One hundred and fifty percent of the citywide average is 20 percent (Source: U.S. Census).
[61] In 2010, 52 percent of the city's residents were non-white (Source: U.S. Census).



Five Socio-Economic Indicators of Vulnerability	
a	Unemployment rate
b	Household income
c	Age - youth population (0-14)
d	Age - elderly population (65+)
e	Minority population (>50% non-white)

LEGEND

- County Boundary
- Neighborhoods
- Highways

NORTH

Feet
0 3,000 6,000

Scale: 1 inch = 6,000 feet

Source: US Census Bureau, 2010

Socio-Economic Vulnerability

- Census tracts omitted from analysis (ACS data gap)
- 5 (Most Vulnerable; no tract achieves score of 5)
- 4
- 3
- 2
- 1
- 0 (Least Vulnerable)

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Figure 7. Socio-Economic Vulnerability (2013)

San Francisco Infrastructure Level of Service Analysis

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10. PROJECT PRIORITIZATION, FINANCING, AND NEXT STEPS

Findings from Case Studies

Because LOS metrics are not often applied in the cities surveyed, the cities reviewed as part of this project have other methods of project prioritization.[62] With a few exceptions, infrastructure improvements are typically prioritized at the department level rather than at the city level and are based on master plans or other guiding policy documents identifying "need" areas, funding availability, and construction or location synergies with other projects. Given financial constraints, improvements tend to be reactive and opportunistic rather than proactive or guided by clear prioritization. Improvements can also be tied to major development projects that cannot move forward without infrastructure improvements to support the project.[63] These can be performed on a case-by-case basis or through a development fee program which allows cities to charge development for the increased demand it will put on city infrastructure.

Of the reviewed cities, Vancouver, Portland, and San Diego provide examples of how infrastructure improvements are prioritized across agencies at a citywide level.

- In **Vancouver**, infrastructure improvements are guided by three key documents: (1) a 10-year capital strategic outlook plan, (2) a 3-year capital plan, and (3) an annual capital budget. Most interesting is the level of public involvement in shaping these documents. The 3-year capital plan involves extensive public outreach, including surveys that allow residents to vote on how to spend capital funds and prioritize

[62] Note that cities with a comprehensive development fee program are required to consider long-range improvements to their capital infrastructure in order to develop a nexus between the development fee and future infrastructure needs. This is especially the case for expanding cities (e.g. Fairfield, Vacaville, etc.) which often consider how future subdivisions will impact their overall infrastructure. Prioritization is based partially in response to existing need but also in tandem with the construction and occupation of homes on the edge of their city. For example, roadway enhancements are often planned with the certification of occupancy permits. Cities, at their discretion, can allow the developer to build infrastructure as credit towards their development fee.

[63] A development fee program can incrementally accumulate capital funds to pay for neighborhood or citywide infrastructure shortfalls before certain infrastructure thresholds halt a given project. Rather than one project paying for the expansion of specific infrastructure because it was the unfortunate project to be timed with infrastructure at 100 percent of capacity, each project is paying its fair share, and then the pool of funds pays to maintain level of service standards.

improvements. This process provides concrete guidance on how funds should be spent and creates a very transparent and participatory process.

- **Portland** produces an annual Citywide Assets Report, which summarizes the provision and value of key infrastructure facilities (transportation, environmental services, water, parks, civil) and shows the funding shortfall. The document is intended to help provide a clear overview of Portland's infrastructure and asset management. One of the key tasks identified by the Report in 2009 was to develop service level targets for each of the participating bureaus – to be adopted, in part, in 2013. Much like San Francisco, it is intended that these service levels will be used to help prioritize infrastructure funding. This, however, remains a future goal, as bureaus are still developing and refining their service levels.
- In **San Diego**, the Public Facility Financing Fee system is tied to its community plans and General Plan which require a public process. The public facility financing fee system is reviewed annually by community planning groups, the Planning Commission, and City Council. The fees are based on public facilities in the community plans, which are based on the General Plan LOS standards.

For other cities that do not employ explicit LOS targets, goals are often woven into development fee programs, which set standards for new development. Other cities aim to maintain current LOS, although the cities do not always define what they are.

It should also be noted that the cities that do not currently use explicit LOS metrics or targets expressed significant interest in San Francisco's work and progress. Developing such targets and applying them to project prioritization will continue to support San Francisco's position as an innovative planning thought leader.

BRIEF FINANCING DISCUSSION

It is clear from the case studies that in other cities, much as in San Francisco, funding for infrastructure improvements is a constant concern. Projects tend to be financed through a number of sources. Capital budget, bonds, user fees, development fees, state and federal programs, private donations and grants, and development agreements all play an important role in maintaining adequate infrastructure facilities. State and local propositions have funded a number of citywide infrastructure initiatives in California[64], and local and regional sales tax initiatives have provided capital funds for transportation enhancements.[65]

Depending on infrastructure type, various funding sources play larger roles. Transportation-related projects tend to qualify for more state and national funding sources, while some cities have had success with fundraising and private donations for their parks facilities. Portland, for example, is targeting private funds for 10 percent of its overall parks budget.

Other cities tend to rely more heavily on development to fund existing and projected infrastructure shortfalls. San Jose has negotiated relatively aggressive development agreements in which it receives a significant percentage of the increased land value when parcels are rezoned as part of the agreement. San Jose indicates that this is one of the few viable options available to them to support their infrastructure demands. This source of funding allows San Jose to apply the money towards existing deficiencies or repairs. Additionally, of course, a number of cities rely on development impact fees for incremental infrastructure demand. A comparative

[64] Some recent propositions that have funded infrastructure initiatives are Propositions 1A – the 2008 Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century; and San Francisco's Proposition 1B – the Highway Safety, Traffic Reduction, Air Quality and Port Security Act.

[65] Three transportation sales taxes in San Jose generate $270 million annually (in 2013) and are distributed through the Santa Clara Valley Transit Authority. United States. Santa Clara Valley Transit Authority (VTA). "Adopted Biennial Budget- Fiscal Years 2013 and 2013." VTA, 2011-2013. Web. 22 Jul. 2013. http://www.vta.org/inside/budget/FY12_and_FY13_Budget_Book.pdf

analysis of impact fees for childcare, streetscape, and park infrastructure was developed for twenty-two cities throughout California in the 2008 *City & County of San Francisco Citywide Development Impact Fee Study*.[66] Citywide impact fees for recreation and open space are most common in the surveyed cities, followed by streetscape and pedestrian infrastructure fees. Only one city, Concord, charged impact fees for childcare. As impact fees are tied to an implied LOS target, the lack of impact fees for streetscape and childcare provision support the findings of this report that LOS targets for provisions other than recreation and open space and, occasionally, transit infrastructure are rare.

It is important to note, that while most impact fees are charged at the citywide level, some cities, like San Francisco, have different fees applied at different levels. In San Diego, for example, development impact fees are primarily set at the community level and can vary widely across the city.

NEXT STEPS & IMPLICATIONS FOR NEXUS ANALYSIS

The LOS targets developed as part of this report will serve as useful starting points for the Nexus study. As indicated, while not all of the metrics and targets are appropriate for the Nexus study, setting agreed upon LOS helps to manage expectations and increase predictability for the city as well as potential developers.

The passage of AB 1600 in 1988 resulted in a framework for establishing development impact fees.[67] In general, there are two important factors to consider in developing any nexus analysis. First, AB 1600 requires that development impact fees only charge new development with the cost of providing infrastructure services required by the additional development. Cities are not allowed to apply development impact fees to pay for existing shortfalls. Where this study identifies infrastructure shortfalls that do not reach citywide LOS goals, the City remains responsible for managing those shortfalls. As a result, the LOS goals provide guidance for future development's share of the total infrastructure need.

Second, AB 1600 indicates that the City must have a plan for how it is going to reach its proposed LOS target if it has not already been met. In other words, if the city is unable to meet the proposed LOS, the city cannot charge new development for this standard. Further, development fees should pay specifically for capital improvements and not for the ongoing operations and maintenance of existing facilities, since the fees are intended to accommodate the facility demand of the new service population. Fees going to operations and maintenance do not permanently resolve ongoing facility needs of the new populations.

Operation and Maintenance Resources

Maintaining a realistic LOS becomes an important part of both evaluating provision and applying the target to a nexus analysis.

Although nexus fees focus on capital costs, ongoing revenue to operate and maintain the infrastructure investments is equally important. Cities, especially in California under Proposition 13, continually struggle with the ongoing maintenance of their community facilities and infrastructure assets. General Fund dollars are limited, and, during recession periods, cities make hard choices about maintaining, say, adequate police and fire services, or ongoing maintenance/repairs in sidewalks, parks, and street trees. As a caution, setting level of service goals too high can ultimately undermine the capital investments as they slowly depreciate and become

[66] FCS Group. "City & County of San Francisco Citywide Development Impact Fee Study, Chapter III." March 2008. Print.
[67] Before AB 1600, the 1975 Quimby Act established the right of cities to require developers to mitigate the impacts of development, specifically on neighborhood and community park demand.

deteriorating public assets that don't serve their initial purpose. Modest capital planning in concert with secured operation and maintenance revenue provides a more prudent and fiscally-sustainable course.

Special taxes (such as parcel taxes, lighting and landscape districts, business improvement districts, and community benefits districts) can support the ongoing maintenance of capital facilities, although they can be difficult to pass considering the two-thirds voter requirements in California.

11. APPENDICES

SERVICE POPULATION DEFINITION

The term **Service Population Units** refers to the number of people, or units, that are served by a given infrastructure type. The service population for each infrastructure category is shown below in Table 27.

Service population units are calculated in this study as one times the resident population plus one-half times the employee population, setting up a 1:0.5 ratio of intensity of use between residents and employees. This ratio reflects the fact that both residents and employees require infrastructure, while discounting employees who typically use infrastructure less intensively than residents.

For recreation and open space, the service population unit calculation is slightly modified to a 1:0.19 ratio between residents and employees (i.e. service population units are equal to one times the resident population plus 0.19 times the employee population). This ratio applies a greater discount to employees, because recreation and open space is used much more at home than near work, as analyzed by the Hausrath Economics Group in a study entitled "Phoenix Park and Library EDU Factors Study" (September 2008).

A more detailed discussion of service population can be found in the companion report, the *San Francisco Citywide Nexus Analysis* (March 2014), and its appendix report, *San Francisco Citywide Nexus Analysis – Service Population Concept Memorandum* (September 24, 2013).

Table 27. Service Population Per Infrastructure Category

Facility Type	LOS Metric	2013	Future Year	Growth
	**Recreation and Open Space**	**2013**	**2030**	**Growth (2013 - 2030)**
	Service Population	934,726	1,081,926	147,200
	**Childcare**	**2013**	**2020**	**Growth (2013 - 2020)**
	Service Population	N/A	N/A	N/A
	**Streetscape and Pedestrian Infrastructure**	**2013**	**2030**	**Growth (2013 - 2030)**
	Service Population	1,120,955	1,301,049	180,094
	**Bicycle**	**2013**	**2020**	**Growth (2013 - 2020)**
	Service Population	1,120,955	1,211,217	90,261
	**Transit**			
1	Service Population	N/A	N/A	N/A

Source: AECOM, 2013

CITYWIDE AND NEIGHBORHOOD POLICY DOCUMENTS

The following lists summarize the citywide and neighborhood-specific policy documents that were reviewed as part of the project effort. The policy documents served as a guide for the LOS metric and standard development. Full texts for the policy documents are included in a separate appendix file.

Citywide Policy and Planning Documents:

- FY 2009-10 Development Impact Fee Report (2009)
- San Francisco Citywide Development Impact Feed Register (January 2013)
- City & County of San Francisco Citywide Development Impact Fee Study (2008)
- Draft Capital Plan Fiscal Years 2014-2023 (2013)
- San Francisco Recreation & Open Space Element (2011)
- San Francisco Recreation and Park Department Acquisition Policy (2011)
- Child Care Nexus Study for City of San Francisco (2007)
- San Francisco Child Care Needs Assessment (2007)
- San Francisco Citywide Plan for Early Care and Education and Out of School Time (2012)
- San Francisco Better Streets Plan (2010)
- Walk First (2011)
- Financing San Francisco's Urban Forest (2012)
- San Francisco Bicycle Plan (2009)
- San Francisco Transportation Sustainability Fee Nexus Study (2012)
- San Francisco Transit Impact Development Fee (2011)

Neighborhood Specific Policy and Planning Documents:

- Eastern Neighborhoods Impact Fee and Affordable Housing Analysis (2008)
- Downtown San Francisco Park, Recreation, and Open Space Development Impact Fee Nexus Study (2012)
- The Market and Octavia Draft Community Improvements Program Document (2007)
- Rincon Hill Area Plan (of the General Plan) (2005)
- San Francisco Eastern Neighborhoods Nexus Study (2008)
- San Francisco General Plan Area Plans:
    - Balboa Park
    - Eastern Neighborhoods
    - Market and Octavia
    - Rincon Hill
    - Visitacion Valley
- Transit Center District Plan Transportation System Improvements Development Impact Fee Nexus Study (2012)
- Visitacion Valley Nexus Study (2010)
- Western SOMA Nexus Draft (2012)

CITYWIDE AGENCY STAKEHOLDERS

The findings in this report were developed in coordination with the following San Francisco agencies and stakeholders. AECOM relied on the agency stakeholders to provide feedback and guidance on the metrics and standards that were proposed either in existing policy documents, or based on additional research. All metrics and standards were ultimately approved by the agency stakeholders. All of the agencies and their respective stakeholders were identified by the client. Additional stakeholders were included as necessary.

Table 28. San Francisco Agency and Stakeholder Contributors

Infrastructure Type	San Francisco Agency	Key Stakeholders & Contacts
Recreation and Open Space Facilities	Recreation and Park Department (RPD)	• Karen Mauney-Brodek • Sue Exline (Planning Department) • Taylor Emerson • Stacy Bradley • Dawn Kamalanathan
Childcare Facilities	Office of Early Care and Education (OECE)	• Graham Dobson • Michelle Rutherford • Child Care Needs Assessment Committee
Streetscape and Pedestrian Infrastructure	Planning Department	• Adam Varat • Lily Langlois • Kearstin Dischinger
	Department of Public Works (DPW)	• Cristina Olea • Ananda Hirsch • John Dennis
Bicycle and Transit Infrastructure	Municipal Transportation Agency (MTA)	• Ariel McGinnis • Darton Ito • Grahm Satterwhite • Heath Maddox • Seleta Reynolds

Source: AECOM, 2013

METRIC AND MAP DATA SOURCES

Data sources used in the metrics and maps presented in this report include:

Table 29. Metric and Map Data Sources

Data	Data File Name	Source	Data Year
General Data			
Housing, population, and employment projections	LUA2012_JHC.lpk	Planning Department (Aksel Olsen, Planner/Geographer)	2012
Average household size	20130508_HHSizeByBuilding Size.xlsx	Planning Department (Aksel Olsen, Planner/Geographer)	*Current*
Census socioeconomic data	2010_Census_SanFrancisco. shp	Factfinder2.census.gov (American Fact Finder)	2010
Income levels by household size in San Francisco	2010 Maximum Income by Household Size	http://sf-moh.org/Modules/ShowDocument.aspx?documentid=4614	2010
Parks and Open Space			
Park acreage, location, ownership, and characteristics	OpenSpace.mdb	Planning Department (Mike Webster, Geographic Information Systems)	*Current*
Acreage and active/passive classification for RPD-owned parks	RPD_Parks.shp	Planning Department (Mike Webster, Geographic Information Systems)	*Current*
Childcare			
Licensed center-based childcare information	2.1Licensed ChildCare Capacity.xlsx	OECE (Graham Dobson, Administrative Analyst for ECE Policy)	2011
Family care center (FCC) childcare information	2.2FCCH Capacity.xlsx	OECE (Graham Dobson, Administrative Analyst for ECE Policy)	2011
Streetscape and Pedestrian Infrastructure			
Locations and characteristics of all traffic signals and flashing beacons maintained by SFMTA	Allsignals.shp	SFMTA (Gabriel Ho, Engineer)	*Current*
Sidewalk provision and widths	Stwidths.xls	DPW (Ananda Hirsch, Transportation Finance Analyst)	*Current*
Location of non-park trees	SFDPW_Trees.shp	Planning Department (Mike Webster, Geographic Information Systems)	*Current*
Street classifications	Streets_bsp.shp	Planning Department (Kearstin Dischinger, Senior Community Development Specialist)	*Current*
Intersection and injury information	PedVol.shp	SFMTA (Mari Hunter, Transit Planner)	2009 – 2010
Bicycle			
San Francisco bicycle network, with Comfort Index classifications (LTS 1 to 4)	ComfortIndex.shp	SFMTA (Andrew LEE, Senior Transportation Planner)	*Current*
Bicycle network in San Francisco, including Class I – III classifications	SFMTA Bikeway Network.shp	SFMTA (Charlie Ream, Urban Planner)	*Current*

Source: AECOM, 2013

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CASE STUDY TABLES

Table 30. Summary of Key Existing Quantitative LOS Provision by Case Study City

Infrastructure	San Francisco	Boston	Miami	Minneapolis	Philadelphia	Portland	San Diego	San Jose	Vancouver
Recreation and Open Space	• Over 200 city-owned parks • 6,600 acres of open space within city limits • 3,600 acres of active space	• Over 7000 acres of open space	• 5% land area devoted to open space (800 acres)	• N/A	• 60% of residents live within 10 minutes/0.5 mi of open space	• 70% of residents within 3 miles of full-service community center • 75% of residents within ½ mile of park	• 2.8 acres per 1,000 for neighborhood and community parks, subject to "equivalencies" as determined at the community plan level	• N/A	• 92% of residents live within 5 minutes of green space
Acres / 1000 Residents (FY 2011)[68] [Includes city, county, metro, state, or federal public parkland within the city limits]	• 6.6 acres / 1,000 residents (per Trust for Public Land Data) • 8.1 acres per 1,000 residents per RPD data	• 7.6 acres / 1,000 residents	• 2.8 acres / 1,000 residents	• 13.3 acres / 1,000 residents	• 7.2 acres / 1,000 residents	• 24.6 acres / 1,000 residents (Intermediate -Low density city)	• 35.9 acres / 1,000 residents (Intermediate -Low density city)	• 16.5 acres / 1,000 residents	• 6.97 acres / 1,000 residents (without regional parks)

[68] "Acres of Parkland per 1,000 Residents, by City." *The Trust for Public Land*. The Trust for Public Land, 2011. Web. 22 Jul. 2013. http://cityparksurvey.tpl.org/reports/report_display.asp?rid=4

Infrastructure	San Francisco	Boston	Miami	Minneapolis	Philadelphia	Portland	San Diego	San Jose	Vancouver
Annual Spending per Resident (FY 2011)[69] [Capital and operational expenses]	• $263 / resident	• $110 / resident	• $13 / resident	• $227 / resident	• $46 / resident	• $151 / resident	• $106 / resident	• $118 / resident	• $150 / resident
Childcare	• 2,951 licensed childcare spaces for infants and toddlers • 14,661 licensed childcare spaces for preschoolers	• N/A	• 3 daycares run by P&R (grant-funded)	• N/A	• N/A	• N/A	• N/A	• N/A	• 53 Childcare facilities • 19% of all children have access to public care
Streetscape and Pedestrian Infrastructure	• 105,000 existing street trees	• N/A	• N/A	• 92% of streets have sidewalks	• 131,000 existing street trees • 55 trees / mile of city street	• 17% of canopy coverage over streets • 1,900 miles of sidewalk	• 3.5% average pedestrian commute mode share • 5,000 miles of sidewalk	• N/A	• 138,000 street trees • 2,400 km of sidewalks

[69] "Total Spending on Parks and Recreation per Resident by City." *The Trust for Public Land.* The Trust for Public Land, 2011. Web. 22 Jul. 2013. http://cityparksurvey.tpl.org/reports/report_display.asp?rid=4http://cityparksurvey.tpl.org/reports/report_display.asp?rid=7

Infrastructure	San Francisco	Boston	Miami	Minneapolis	Philadelphia	Portland	San Diego	San Jose	Vancouver
Bicycle Infrastructure	• 216 miles of bike network • Current bicycle mode share of 3.5%	• Silver designation from the League of American Bicyclists' Bicycle Friendly Community program • >100 miles of bike network	• 17.12 miles of bike network • 1.6% of street network	• ~20% of streets have bike network (2012) • 128 miles of bike network (2009)	• 230 street miles of bike network	• >300 miles of bike network	• 511 miles of bike network	• 200 miles of bike network	• 280 miles of bike network • 100% of buses are bike-accessible
Miles of Bike Lane / 1,000 Residents (2010 census)	• 0.27	• 0.16	• 0.04	• 0.33	• 0.15	• 0.51	• 0.39	• 0.21	• 0.47
Miles of Bike Lane / 1,000 Residents / City Area (2010 census)	• 0.006	• 0.003	• 0.001	• 0.006	• 0.001	• 0.004	• 0.001	• 0.001	• 0.010
Transit Infrastructure	• Average 33.7 minutes per transit travel time	• N/A	• N/A	• N/A	• No citywide standard	•	• No citywide standard	• N/A	• N/A

Table 31. Summary of Key Quantitative LOS Goals by Case Study City (including San Francisco)

Infrastructure	San Francisco	Boston	Miami	Minneapolis	Philadelphia	Portland	San Diego	San Jose	Vancouver
Recreation and Open Space	• 10 minute / ½ mile access to open space for all residents • 0.5 acres / 1,000 residents within a ½ mile radius.	• N/A	• ¼ mile access to open space	• No quantitative goals	• 10 minute walk for 75% of residents by 2025 (0.5mi) • Add 500 acres by 2015 • 10 acres / 1,000 residents	• By 2020, 1,870 more acres of park • 100% of residents within 3 miles of a community center • 100% of residents w/in ½ mile of park	• 2.8 acres / 1,000 residents of neighborhood and community parks	• 31 acres / 1,000 residents • 3.5 acres of community serving parks / 1,000 residents	• 100% of residents within 5 min walk to green space, by 2020 • Plant 150,000 new trees by 2020
Childcare	• Few quantitative goals	• N/A	• N/A	• N/A	• N/A	• N/A	• N/A	• N/A	• 500 new spaces by 2014
Streetscape and Pedestrian Infrastructure	• Few quantitative goals • Significant design guidelines and qualitative objectives • 160,000 street trees by 2030.	• Few quantitative goals • Complete the pedestrian network	• No quantitative goals	• No quantitative standards • Qualitative objectives, and design guidelines	• Reduce pedestrian accidents 50% by 2020 • Increase walk mode share from 8.6% to 12% by 2020 • Keep 70% of assets in good repair • Increase tree coverage to 30% (by adding 300,000 trees by 2025)	• Neighborhoods must maintain citywide average for % of arterials with sidewalks • 35% of canopy coverage over streets • 150 additional miles of trails.	• No quantitative goals	• 100% of non-rural portions of San Jose should have a continuous sidewalk network • Every street should be complete, accommodate pedestrian and bike	• Increase pedestrian mode share (66% of all trips to be by bike, walk, or transit by 2040) • By 2014, 2km of additional sidewalk • Plant 150,000 new trees by 2020

Infrastructure	San Francisco	Boston	Miami	Minneapolis	Philadelphia	Portland	San Diego	San Jose	Vancouver
Bicycle Infrastructure	• 250 miles at build-out, 200 being premium facilities • 50,000 bike parking spaces • 200 upgraded intersections • 3000+ bicycle / 300+ station bike share program • 8%-10% mode share by 2018-2020	• 417 miles at build-out • 10% of all trips by bike by 2025 • Plan to cover the entire city and connect to regional network	• 280 miles by 2030 (33% of street network with bikeways) • Obtain Bike Friendly City status	• No current LOS goals • Aim to pass Complete Streets Policy • Add 183 miles within in 30 years (= 311 miles)	• Reduce bike accidents 50% by 2020 • Increase bike mode share from 1.6% to 6.5% • League of American Bicyclists "Platinum" (2013) • 70% of assets in good repair • Reduce VMT by 10%	• 3% bike commuting trips • 630 miles of total bike network by 2030 • All areas must maintain citywide average for bike lane miles per 1,000 households	• 1,089.9 miles of proposed total bicycle network • Increased bicycle mode share	• 450 miles of bike facilities proposed	• Increase bike mode share • Expand 'all ages and abilities' bike network • Provide additional bike parking • 328 total miles in bike network as near-term goal
Bicycle miles / 1,000 Current Res. Goal[70]	• 0.27	• 0.68	• 0.70	• 0.81	• 0.36	• 1.08	• 0.83	• 0.48	• 0.54
Transit Infrastructure	• 85% transit crowding target • Average 33.6 minutes per transit travel time	• No quantitative goals	• No quantitative goals	• No quantitative goals	• No quantitative goals	• Transit load factor < 100% • 19% transit commuting trips	• Increased ridership, and having an attractive, convenient transit system • ~15% of transit trips shorter than 30 minutes (compared to 8% BAU)	• No quantitative goals	• Increase transit mode share

[70] Calculated from proposed bicycle network length and current population.

SOCIOECONOMIC INDICATORS BY NEIGHBORHOOD

Table 32. Unemployment Rate Among Civilian Workforce by Neighborhood (2010)

Neighborhood	Total % Unemployment /1
Bayview	13%
Bernal Heights	7%
Castro/Upper Market	6%
Chinatown	14%
Crocker Amazon	11%
Diamond Heights	6%
Downtown/Civic Center	10%
Excelsior	9%
Financial District	7%
Glen Park	7%
Golden Gate Park	6%
Haight Ashbury	5%
Inner Richmond	7%
Inner Sunset	4%
Lakeshore	7%
Marina	5%
Mission	6%
Nob Hill	7%
Noe Valley	5%
North Beach	7%
Ocean View	10%
Outer Mission	6%
Outer Richmond	7%
Outer Sunset	7%
Pacific Heights	4%
Parkside	8%
Potrero Hill	7%
Presidio	3%
Presidio Heights	5%
Russian Hill	9%
Seacliff	7%
South of Market	6%
Treasure Island/YBI	13%
Twin Peaks	6%
Visitacion Valley	12%
West of Twin Peaks	5%
Western Addition	6%
Citywide Average	7%
150% of Citywide Average	11%

Source: 2010 American Community Survey

1. XX Indicates value above 150 percent of citywide average

Table 33. Percentage of Households below 80 Percent of the Citywide Area Median Income (AMI) (2010)

Neighborhood	Total % HH BELOW 80% Citywide AMI /1
Bayview	68%
Bernal Heights	41%
Castro/Upper Market	38%
Chinatown	84%
Crocker Amazon	50%
Diamond Heights	42%
Downtown/Civic Center	84%
Excelsior	51%
Financial District	55%
Glen Park	40%
Golden Gate Park	47%
Haight Ashbury	41%
Inner Richmond	50%
Inner Sunset	40%
Lakeshore	52%
Marina	33%
Mission	54%
Nob Hill	61%
Noe Valley	34%
North Beach	53%
Ocean View	49%
Outer Mission	43%
Outer Richmond	47%
Outer Sunset	49%
Pacific Heights	31%
Parkside	40%
Potrero Hill	33%
Presidio	35%
Presidio Heights	41%
Russian Hill	50%
Seacliff	36%
South of Market	51%
Treasure Island/YBI	68%
Twin Peaks	37%
Visitacion Valley	64%
West of Twin Peaks	31%
Western Addition	57%
Citywide Average	**50%**

Source: 2010 American Community Survey

1. XX Indicates value above citywide average

Table 34. Percentage of Children and Elderly by Neighborhood (2010)

Neighborhood	Population 0-14 /1	Population 65+ /1
Bayview	20%	11%
Bernal Heights	14%	11%
Castro/Upper Market	6%	10%
Chinatown	8%	26%
Crocker Amazon	15%	15%
Diamond Heights	13%	18%
Downtown/Civic Center	6%	13%
Excelsior	15%	15%
Financial District	6%	19%
Glen Park	14%	14%
Golden Gate Park	7%	9%
Haight Ashbury	9%	8%
Inner Richmond	11%	14%
Inner Sunset	11%	12%
Lakeshore	10%	14%
Marina	8%	13%
Mission	11%	9%
Nob Hill	5%	17%
Noe Valley	12%	10%
North Beach	8%	18%
Ocean View	14%	13%
Outer Mission	15%	14%
Outer Richmond	12%	17%
Outer Sunset	12%	16%
Pacific Heights	9%	14%
Parkside	13%	17%
Potrero Hill	13%	8%
Presidio	19%	4%
Presidio Heights	13%	18%
Russian Hill	6%	20%
Seacliff	14%	20%
South of Market	6%	10%
Treasure Island/YBI	14%	1%
Twin Peaks	8%	19%
Visitacion Valley	18%	13%
West of Twin Peaks	15%	18%
Western Addition	7%	16%
Citywide Average	**11%**	**14%**
150% Citywide Average	**17%**	**20%**

Source: 2010 U.S. Census

1. XX Indicates value above 150 percent of citywide average

Table 35. Percentage of Non-White (Minority) Population by Neighborhood (2010)

	% of Non-White (Minority) Population /1
Bayview	87%
Bernal Heights	42%
Castro/Upper Market	20%
Chinatown	81%
Crocker Amazon	79%
Diamond Heights	37%
Downtown/Civic Center	54%
Excelsior	74%
Financial District	58%
Glen Park	27%
Golden Gate Park	39%
Haight Ashbury	23%
Inner Richmond	49%
Inner Sunset	42%
Lakeshore	52%
Marina	16%
Mission	43%
Nob Hill	49%
Noe Valley	23%
North Beach	46%
Ocean View	78%
Outer Mission	68%
Outer Richmond	56%
Outer Sunset	65%
Pacific Heights	19%
Parkside	63%
Potrero Hill	35%
Presidio	23%
Presidio Heights	26%
Russian Hill	42%
Seacliff	43%
South of Market	53%
Treasure Island/YBI	65%
Twin Peaks	33%
Visitacion Valley	86%
West of Twin Peaks	41%
Western Addition	43%
Citywide Average	**52%**

Source: 2010 U.S. Census

1. XX Indicates value above citywide average

CHILDCARE DEMAND CALCULATIONS

Table 36: Existing (2013) Childcare Demand for Infant/Toddler Care (0-2)

	Measure	Value	Source/Calculation
Total Resident-Children			
A	Total resident-children (0-2)	21,900	Michele Rutherford, Program Manager for San Francisco Human Services Agency via email to Harriet Ragozin (KMA) on 11/15/13
Resident-Children (0-2) Needing Care Outside of San Francisco			
B	Total Employed San Francisco Residents	446,800	U.S. Census Bureau, 2009-2011 American Community Survey; DP03
C	% Employed Residents working outside of San Francisco	23%	U.S. Census Bureau, 2009-2011 American Community Survey; S0801
D	Total employed San Francisco Residents working outside San Francisco	100,530	B * C
E	% of total employed San Francisco Residents working outside San Francisco, who need childcare outside San Francisco	5%	Based on South San Francisco Child Care Facilities Impact Fee Nexus Study and surveys of corporate employees and other child care studies, reviewed by Brion & Associates, including Santa Monica's New Child Care Fee Nexus Study (as cited in Table 6 of Child Care Nexus Study for San Francisco by Brion & Associates); assumes one child needing care per employee
F	Resident-children needing childcare outside of San Francisco	5,027	D * E
G	% of children ages 0-2	51%	Michele Rutherford, Program Manager for San Francisco Human Services Agency via email to Harriet Ragozin (KMA) on 11/15/13; assumes that school age children have care near home or school and all resident-children needing care outside of San Francisco are either infants/toddlers or preschoolers
H	Resident-children (0-2) needing childcare outside of San Francisco	2,544	F * G
Resident-Children (0-2) Needing Care in San Francisco			
I	Total resident-children (0-2) potentially needing childcare	19,356	A - H
J	Average labor force participation rate of parents	58%	Bureau of Labor Statistics (Table 4)
K	Children with working parents	11,200	I * J
L	% children (0-2) with working parents needing licensed care	37%	Table 7 of Child Care Nexus Study for San Francisco by Brion & Associates (based on a detailed review of 12 child care studies, including impact fee studies; demand factors developed in concert with Dept. of Human Services and DCYP)
M	**Total resident-children (0-2) needing licensed care in San Francisco**	**4,144**	K * L
Non-Resident Children (0-2) Needing Care in San Francisco			
N	Employees that live elsewhere but work in San Francisco	154,000	San Francisco Planning Department employment projections (as per Aksel Olsen, Geographer/Planner); U.S. Census Bureau, 2009-2011 American Community Survey; DP03
O	Estimated % of non-resident employees needing licensed childcare	5%	As above (E)
P	Children needing licensed childcare	7,700	N * O
Q	% of children ages 0 - 2	50%	Department of Finance (Report P-3); assumes that school age children have care near home or school and all resident-children needing care outside of San Francisco are either infants/toddlers or preschoolers
R	**Non-resident employee's children (0-2) needing care in San Francisco**	**3,861**	P * Q
Total Children (0-2) Needing Care in San Francisco			
S	Total children (0-2) needing licensed care in San Francisco	8,005	M + R
Existing Supply			
T	Current available spaces for children aged 0-2	2,951	Michele Rutherford, Program Manager for San Francisco Human Services Agency via email to Harriet Ragozin (KMA) on 11/15/13
Existing LOS			
% of demand met by existing slots		**37%**	T / S

Table 37: Existing (2013) Childcare Demand for Preschooler Care (3-5)

	Measure	Value	Source/Calculation
Total Resident-Children			
A	Total resident-children (3-5)	21,300	Michele Rutherford, Program Manager for San Francisco Human Services Agency via email to Harriet Ragozin (KMA) on 11/15/13
Resident-Children (3-5) Needing Care Outside of San Francisco			
B	Total Employed San Francisco Residents	446,800	U.S. Census Bureau, 2009-2011 American Community Survey; DP03
C	% Employed Residents working outside of San Francisco	23%	U.S. Census Bureau, 2009-2011 American Community Survey; S0801
D	Total employed San Francisco Residents working outside San Francisco	100,530	B * C
E	% of total employed San Francisco Residents working outside San Francisco, who need childcare outside San Francisco	5%	Based on South San Francisco Child Care Facilities Impact Fee Nexus Study and surveys of corporate employees and other child care studies, reviewed by Brion & Associates, including Santa Monica's New Child Care Fee Nexus Study (as cited in Table 6 of Child Care Nexus Study for San Francisco by Brion & Associates); assumes one child needing care per employee
F	Resident-children needing childcare outside of San Francisco	5,027	D * E
G	% of children ages 3-5	49%	Michele Rutherford, Program Manager for San Francisco Human Services Agency via email to Harriet Ragozin (KMA) on 11/15/13; assumes that school age children have care near home or school and all resident-children needing care outside of San Francisco are either infants/toddlers or preschoolers
H	Resident-children (3-5) needing childcare outside of San Francisco	2,483	F * G
Resident-Children (3-5) Needing Care in San Francisco			
I	Total resident-children (3-5) potentially needing childcare	18,800	A - H
J	Average labor force participation rate of parents	58%	Bureau of Labor Statistics (Table 4)
K	Children with working parents	10,878	I * J
L	% children (3-5) needing licensed care	100%	Table 7 of Child Care Nexus Study for San Francisco by Brion & Associates (based on a detailed review of 12 child care studies, including impact fee studies; demand factors developed in concert with Dept. of Human Services and DCYP)
M	**Total resident-children (3-5) needing licensed care in San Francisco**	**10,878**	K * L
Non-Resident Children (3-5) Needing Care in San Francisco			
N	Employees that live elsewhere but work in San Francisco	154,000	San Francisco Planning Department employment projections (as per Aksel Olsen, Geographer/Planner); U.S. Census Bureau, 2009-2011 American Community Survey; DP03
O	Estimated % of non-resident employees needing licensed childcare	5%	As above (see E)
P	Children needing licensed childcare	7,700	N * O
Q	% of children ages 3-5	50%	Department of Finance (Report P-3); assumes that school age children have care near home or school and all resident-children needing care outside of San Francisco are either infants/toddlers or preschoolers
R	**Non-resident employee's children (3-5) needing care in San Francisco**	**3,839**	P * Q
Total Children (3-5) Needing Care in San Francisco			
S	Total children (3-5) needing licensed care in San Francisco	14,717	M + R
Existing Supply			
T	Current available spaces for children (3-5)	14,661	Michele Rutherford, Program Manager for San Francisco Human Services Agency via email to Harriet Ragozin (KMA) on 11/15/13
Existing LOS			
% of demand met by existing slots		**99.6%**	T / S

Table 38: Future (2020) Childcare Demand for Infant/Toddler Care (0-2)

	Measure	Value	Source/Calculation
Total Resident-Children			
A	Total resident-children (0-2)	29,600	Planning Department population projections (as per Aksel Olsen, Geographer/Planner) times proportion of infants/toddlers based on Department of Finance projections (Report P-3)
Resident-Children (0-2) Needing Care Outside of San Francisco			
B	Total Employed San Francisco Residents	483,200	Employment projections from the San Francisco Planning Department (as per Aksel Olsen, Geographer/Planner), assuming the resident/non-resident employment split from the U.S. Census Bureau, 2009-2011 American Community Survey; DP03
C	% Employed Residents working outside of San Francisco	23%	U.S. Census Bureau, 2009-2011 American Community Survey; S0801
D	Total employed San Francisco Residents working outside San Francisco	108,720	B * C
E	% of total employed San Francisco Residents working outside San Francisco, who need childcare outside San Francisco	5%	Based on South San Francisco Child Care Facilities Impact Fee Nexus Study and surveys of corporate employees and other child care studies, reviewed by Brion & Associates, including Santa Monica's New Child Care Fee Nexus Study (as cited in Table 6 of Child Care Nexus Study for San Francisco by Brion & Associates); assumes one child needing care per employee
F	Resident-children needing childcare outside of San Francisco	5,436	D * E
G	% of children ages 0-2	56%	Planning Department population projections (as per Aksel Olsen, Geographer/Planner) ;Department of Finance projections (Report P-3); assumes that school age children have care near home or school and all resident-children needing care outside of San Francisco are either infants/toddlers or preschoolers
H	Resident-children (0-2) needing childcare outside of San Francisco	3,043	F * G
Resident-Children (0-2) Needing Care in San Francisco			
I	Total resident-children (0-2) potentially needing childcare	26,600	A - H
J	Average labor force participation rate of parents	58%	Bureau of Labor Statistics (Table 4)
K	Children with working parents	15,391	I * J
L	% children (0-2) with working parents needing licensed care	37%	Table 7 of Child Care Nexus Study for San Francisco by Brion & Associates (based on a detailed review of 12 child care studies, including impact fee studies; demand factors developed in concert with Dept. of Human Services and DCYP)
M	**Total resident-children (0-2) needing licensed care in San Francisco**	**5,695**	K * L
Non-Resident Children (0-2) Needing Care in San Francisco			
N	Employees that live elsewhere but work in San Francisco	194,300	San Francisco Planning Department employment projections (as per Aksel Olsen, Geographer/Planner); U.S. Census Bureau, 2009-2011 American Community Survey; DP03
O	Estimated % of non-resident employees needing licensed childcare	5%	As above (E)
P	Children needing licensed childcare	9,715	N * O
Q	% of children ages 0 - 2	50%	Department of Finance (Report P-3); assumes that school age children have care near home or school and all resident-children needing care outside of San Francisco are either infants/toddlers or preschoolers
R	**Non-resident employee's children (0-2) needing care in San Francisco**	**4,839**	P * Q
Total Children (0-2) Needing Care in San Francisco			
S	Total children (0-2) needing licensed care in San Francisco	10,534	M + R

Table 39: Future (2020) Childcare Demand for Preschooler Care (3-5)

*	Measure	Value	Source/Calculation
Total Resident-Children			
A	Total resident-children (3-5)	23,300	Planning Department population projections (as per Aksel Olsen) times proportion of infants/toddlers based on Department of Finance projections (Report P-3)
Resident-Children (3-5) Needing Care Outside of San Francisco			
B	Total Employed San Francisco Residents	483,200	Employment projections from the San Francisco Planning Department (as per Aksel Olsen, Geographer/Planner), assuming the same split of resident-employees versus non-resident-employees as the U.S. Census Bureau, 2009-2011 American Community Survey; DP03
C	% Employed Residents working outside of San Francisco	23%	U.S. Census Bureau, 2009-2011 American Community Survey; S0801
D	Total employed San Francisco Residents working outside San Francisco	108,720	B * C
E	% of total employed San Francisco Residents working outside San Francisco, who need childcare outside San Francisco	5%	Based on South San Francisco Child Care Facilities Impact Fee Nexus Study and surveys of corporate employees and other child care studies, reviewed by Brion & Associates, including Santa Monica's New Child Care Fee Nexus Study (as cited in Table 6 of Child Care Nexus Study for San Francisco by Brion & Associates); assumes one child needing care per employee
F	Resident-children needing childcare outside of San Francisco	5436	D * E
G	% of children ages 3-5	44%	Planning Department population projections (as per Aksel Olsen, Geographer/Planner); Department of Finance projections (Report P-3); assumes that school age children have care near home or school and all resident-children needing care outside of San Francisco are either infants/toddlers or preschoolers
H	Resident-children (3-5) needing childcare outside of San Francisco	2,393	F * G
Resident-Children (3-5) Needing Care in San Francisco			
I	Total resident-children (3-5) potentially needing childcare	20,907	A - H
J	Average labor force participation rate of parents	58%	Bureau of Labor Statistics (Table 4)
K	Children with working parents	12,097	I * J
L	% children (3-5) with working parents needing licensed care	100%	Table 7 of Child Care Nexus Study for San Francisco by Brion & Associates (based on a detailed review of 12 child care studies, including impact fee studies; demand factors developed in concert with Dept. of Human Services and DCYP)
M	**Total resident-children (3-5) needing licensed care in San Francisco**	**12,097**	K * L
Non-Resident Children (3-5) Needing Care in San Francisco			
N	Employees that live elsewhere but work in San Francisco	194,300	San Francisco Planning Department employment projections (as per Aksel Olsen, Geographer/Planner); U.S. Census Bureau, 2009-2011 American Community Survey; DP03
O	Estimated % of non-resident employees needing licensed childcare	5%	As above (see E)
P	Children needing licensed childcare	9,715	N * O
Q	% of children ages 3-5	50%	Department of Finance (Report P-3); assumes that school age children have care near home or school and all resident-children needing care outside of San Francisco are either infants/toddlers or preschoolers
R	**Non-resident employee's children (3-5) needing care in San Francisco**	**4,876**	P * Q
Total Children (3-5) Needing Care in San Francisco			
S	Total children (3-5) needing licensed care in San Francisco	16,973	M + R