

Appendix B: Buildout and Public Works Capacity

Buildout

Buildout projections are necessary to determine the extent to which the City's public works infrastructure has the capacity to serve existing and anticipated development for the planning horizon and beyond. This appendix presents two levels of buildout estimates: first for the 2040 planning horizon to help foresee infrastructure needs for the life of this Land Use Plan, and second for the maximum theoretical buildout (MTB). These buildout projections are *maximum* as they include all potential development sites and opportunities in Half Moon Bay. They are also *theoretical* as they represent an extreme scenario of development that is unlikely to ever occur. Many sites containing existing development with viable uses may have potential to support additional development, but such additional development may never occur without complete redevelopment or unanticipated changes in use. Other development constraints could impact future buildout as well, such as changed environmental conditions, climate change and sea level rise, and land conservation acquisitions.

Residential buildout projections include vacant sites, infill opportunities, and density bonus considerations for sites in land use designations that permit residential uses. Residential buildout assumptions rely on the City's 2015 certified Housing Element, 2018 County Assessor's data, 2017 American Community Survey data, parcel-by-parcel GIS analysis, and land use and zoning development standards. This buildout is provided in individual units, with a maximum 35% density bonus applied to sites where at least twenty new units are estimated (except for shopping centers). Transfer of development rights (TDR) donor or receiver units are not included, as these units are meant to move density to a different location rather than change the total number of permitted units. The anticipated buildout for the 2040 plan horizon is significantly lower than the MTB as it is constrained by the City's annual residential growth limitation and relies on past market trends and City permit history. It is especially notable that the MTB for residential dwelling units results in a 1,315-unit decrease from what the 1996 Land Use Plan anticipated.

Non-residential buildout projections include vacant and underutilized sites in land use designations that permit non-residential uses and rely on 2018 County Assessor's data, parcel-by-parcel GIS analysis, and land use and zoning development standards. This buildout is provided to the nearest hundred square feet as the existing non-residential floor area is not well documented by the County Assessor and was estimated using GIS and field verification as necessary. The anticipated non-residential buildout for the 2040 plan horizon is also significantly lower than the MTB as it relies on past market trends and City permit history.

In addition to those established above, Appendix B uses the following abbreviations:

DU = Dwelling Unit **DB** = Density Bonus **SF** = Square Feet **FAR** = Floor Area Ratio

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Disclaimer: The buildout estimates in this appendix and the LCP policies on which they are based are not entitlements and do not guarantee that any proposed development will be approved. Any proposed development will be reviewed for its compliance with the certified Land Use Plan policies and zoning regulations and shall not be controlled by the estimates in this appendix.

Table B-1: Residential Buildout Potential – Dwelling Units (DUs)

Neighborhood/Area	Existing DUs	Potential New DUs: -Base	Potential New DUs: - DB¹	Potential New DUs: -Base -DB	Total Potential DUs: -Existing -Base -DB
Town Center					
North Downtown	71	476	74	550	621
Heritage Downtown	227	84	5	89	316
South Downtown	866	197	50	247	1,113
Totals:	1,164	757	129	886	2,050
Outside Town Center					
Neighborhoods ²	2,887	284	0	284	3,171
Planned Developments	726	362	123	485	1,211
Agriculture, Open Space, and Recreation ³	33	16	0	16	49
Totals:	3,646	662	123	785	4,431
Other Residential					
Workforce Housing Overlay ⁴	0	225	75	300	300
ADUs ⁵	20	250	0	250	270
Totals:	20	475	75	550	570
TOTAL:	4,830	1,894	327	2,221	7,051

¹ 35% density bonus (DB) applied to sites with potential for at least 20 new dwelling units.

² Includes established neighborhoods with residential land use designations and residential lots that are not part of neighborhoods, such as the eastern end of Miramontes St.

³ Includes Rural Coastal, Horticulture Business, Open Space for Conservation Regional Public Recreation; does not include Workforce Housing Overlay units.

⁴ Includes affordable Workforce Housing Overlay (WHO) units in Rural Coastal, Horticultural Business, Regional Public Recreation, and Public Facilities land use designations. 95 WHO units are in Town Center; 205 WHO units are outside Town Center.

⁵ ADUs are counted as a half unit as consistent with development footprint and infrastructure needs.

Table B-2: Comparison of 1996 LUP and 2020 LUP Update Residential Buildout

Area	Total Potential Units - 1996 LUP⁶	Total Potential Units - 2020 LUP⁷	Difference: 2020 - 1996 LUP
Town Center ⁸	690	1,870	+1,180
Planned Developments	3,153	1,391	-1,762
Neighborhoods and Pockets	3,524	3,171	-353
Urban Reserve	695	---	-695
Open Space Reserve	50	---	-50
Rural Coastal	---	32	+32
Horticultural Business	56	9	-47
Open Space for Conservation	---	2	+2
Regional Public Recreation	65	6	-59
Workforce Housing Overlay	0	300	+300
Accessory Dwelling Units ⁹	133	270	+137
Totals:	8,366	7,051	-1,315

Table B-3: Summary Comparison of 1996 and 2020 LUP Residential Buildout

Existing (2018) Residential Units¹⁰	New Units per 1996 LUP Estimated MTB¹¹	New Units per 2020 LUP Estimated MTB¹²	% Change in New Units
4,830	3,668	2,211	-40%

⁶ From Table 9-1 and the Planned Development policies in the 1996 LUP, supplemented to include 100 density bonus units in Town Center and 150 density bonus units in Planned Developments.

⁷ Includes density bonus units.

⁸ Noted as Community Core/Spanishtown/Arleta Park East in 1996 LUP (did not include North Downtown area).

⁹ Added ADUs as 50% of dwelling units, ADUs were not included in the 1996 LUP buildout estimates.

¹⁰ Total existing residential units from Table B-1.

¹¹ Total units permitted under 1996 LUP (from Table B-3) minus existing residential units (2018).

¹² Total units permitted under 2020 LUP Update (from Table B-3) minus existing residential units (2018).

Table B-4: General Commercial & Visitor-Serving Commercial Buildout Potential

Area	Buildout Assumption	Potential Additional Area - SF
Town Center¹³		
North Downtown	0.35 – 0.50 FAR	262,800
Heritage Downtown ¹⁴	0.50 FAR + 5% growth factor	116,400
South Downtown	0.35 – 0.50 FAR	135,800
Town Center Total:		515,000
Outside Town Center¹⁵		
Planned Developments	Per Ch. 2 policies	72,400
Other Commercial Areas	0.40 FAR	198,400
Outside Town Center Total:		270,800
TOTAL		785,800

Table B-5: Other Non-Residential Buildout Potential

Area	Buildout Assumption	Potential Additional Area - SF
Light Industrial¹⁶		
In Town Center	See Light Industrial Footnote	124,200
Outside Town Center	See Light Industrial Footnote	25,000
Public Facilities¹⁷		
In Town Center	See Public Facilities Footnote	100,600
Outside Town Center	See Public Facilities Footnote	152,000
Horticultural Business¹⁸		
Outside Town Center	See Hort. Business Footnote	166,000
TOTAL		567,800

¹³ Commercial - Town Center: Applied 0.35 FAR maximum for mixed use and 0.50 FAR maximum for single use commercial in North and South Downtown, and 0.50 FAR maximum for mixed use in Heritage Downtown for vacant and underutilized General Commercial sites inside Town Center.

¹⁴ Commercial – Heritage Downtown: Assumed 5% growth factor in commercial areas of Heritage Downtown to account for potential redevelopment.

¹⁵ Commercial – Outside Town Center: Applied 0.40 FAR maximum for single use commercial to vacant and underutilized Visitor-Serving Commercial sites outside Town Center.

¹⁶ Light Industrial: Assumed 0.35 FAR for development of vacant Highway 92 parcels, and the need for additional warehouse/storage space in other Light Industrial areas rather than application of FAR maximums.

¹⁷ Public Facilities: Assumed 0.10 FAR for supporting structures at the City corporate yard and a 5% growth factor for remaining areas in Public Facilities land use designation.

¹⁸ Hort. Business: Areas in active field agricultural use are considered a developed land use. GIS analysis of land in Horticultural Business not occupied by active field use, greenhouses, or other supporting structures were identified as areas with potential for new greenhouses or other supporting structures.

**Table B-6: Buildout Summary Table –
Population, Residential, Non-Residential and Employment**

	Existing (2018)	2040 Existing + New	2018-2040 % Change	MTB Existing + New	2018 – MTB % Change
Population ¹⁹	12,565	14,535	16%	18,262	46%
Residential (DUs) ²⁰	4,830	5,612	16%	7,051	46%
Commercial (SF) ²¹	1,654,000	1,948,000	18%	2,439,800	48%
Other Non- Residential (SF) ²²	1,336,000	1,483,000	11%	1,903,800	43%
Employment ²³	5,379	6,053	13%	7,684	43%

¹⁹ Existing: American Community Survey; projections based on 2.59 persons per household for new units.

²⁰ Existing: American Community Survey and GIS analysis; 2040 projections based on recent average of 0.7% annual residential development growth per “City of Half Moon Bay Economic and Real Estate Conditions and Trends” report, EPS, 2014; City permit data.

²¹ “City of Half Moon Bay Economic and Real Estate Conditions and Trends” report, EPS, 2014; City permit data.

²² “City of Half Moon Bay Economic and Real Estate Conditions and Trends” report, EPS, 2014; City permit data.

²³ Existing employment based on ABAG projections (2018) of 5,250 jobs in 2015, plus 500 square feet per job of new commercial development and 1,000 square feet per job of other new non-residential development constructed since 2015. Projected employment, VTA/CCAG traffic modeling.

Public Works Capacity

Water

Water Connection Equivalence to Water Use:

Water connections are not sized or allocated according to a specific volume of water use. For modeling purposes, assumptions are based on actual practice: one connection per single-family home and zero connections per ADU. The water demand modeling assumptions in the LUP are 200 gpd for single-family homes and 100 gpd for ADUs, for a total of 300 gpd/connection in the case of a single-family home with an ADU. Based on this modeling level, as well as other reference points noted below, for all other uses (e.g. multi-family dwelling units, Workforce Housing Overlay units, non-residential development, etc.) a factor of 300 gpd/connection is used to broadly estimate the number of connections needed to support the 2040 buildout and MTB. An exception is made for field agriculture, horticultural business, public recreation, and essential service uses, which often have access to private wells, other water sources, and/or existing connections. These uses are likely able to expand with existing water sources and/or connections. Therefore, it is assumed that 50 percent of the connections modeled for these uses will not be needed. The following data points were used to further establish the 300 gpd/connection factor for LUP modeling purposes:

San Mateo County 2013 Certified LCP 380 gpd/connection. San Mateo County LCP phase 1 buildout assumes each unit of affordable housing would require approximately 380 gpd.²⁴

Existing Service Area Connections – 255 gpd/connection. For fiscal year 2019-2020, CCWD sold 1,716,630 gpd (626.57 MGY) of water, and for the prior fiscal year, 2018-2019, sales were 1,643,808 gpd (599.99 MGY). During these years, approximately 6,600 connections were installed. Thus, assuming an average between the two years (1,680,219 gpd), the average amount of water sold equated to about 255 gpd/connection.

These two reference points average about 315 gpd/connection, a factor in line with the 300 gpd/connection factor used in the Half Moon Bay LUP update. It can also be shown that CCWD's water supply can support 300 gpd/new connection as presented below:

Remaining Service Area Connections – 860 gpd/new connection. At the time of the LUP update, CCWD's unsold water supply during the two most recent fiscal years was approximately 1,060,000 gpd (387 MGY). At the same time, 1,231 connections remained uninstalled and available for new development. The amount of water potentially available is 860 gpd/unused connection.

Remaining Service Area Connections Assuming 20 Percent Drought Factor – 416 gpd/new connection. In the previous calculation, the amount of water is significantly higher than actual use per installed connection and assumes consumption of the entire CCWD water supply. Because water agencies are required to plan for 20 percent reductions, a 20 percent drought factor reduces the remaining available supply by 548,000 gpd (200 MGY) to 512,000 gpd (187 MGY). In this case, the amount of water available to each of the remaining connections is 416 gpd/unused connection.

²⁴ San Mateo County Local Coastal Program Policies, June 2013, pages 2.40-2.42, Table 2.17, Phase 1 LCP Priorities.

Table B-7. City of Half Moon Bay New Priority Use Water Supply Reserves and Connections

Priority Land Uses:	2040		Maximum Theoretical Buildout	
	gpd/MGY	Connections	gpd/MGY	Connections
Coastal Act Priority Uses ²⁵	124,680/46	320	219,500/80	507
Ag. and Ag. Compatible uses				
- Field Agriculture	12,500	21	25,000	42
- Horticulture	30,000	50	37,000	62
Coastal Recreation				
- Coastal parks, equestrian	6,250	10	12,500	21
Visitor-Serving Commercial				
- Accommodations	40,000	133	70,000	234
- Restaurant	18,600	62	24,000	80
- Other Commercial	8,600	28	11,700	39
Essential Services	8,750	15	17,500	29
Local Priority Uses ²⁶	40,000/15	133	102,000/37	340
Workforce Housing Overlay w/ Coastal Act Priority Uses	15,000	50	34,000	113
Affordable Housing	25,000	83	68,000	227
Total Annual Demand				
- gpd	164,680	453	321,500	847
- MGY	61		117	

²⁵ Coastal Act Priority Uses:

- Ag and Ag Compatible Uses include:
 - o Field Agriculture: Add growth to 2019 actual use: 2040 +25% increase; MTB +50% increase
 - o Horticulture: 1,500 gpd/acre of new greenhouse site area
- Coastal Recreation: Parks; Commercial Equestrian, etc.: Add growth to 2019 actual use: 2040 +25%; MTB +50% increase
- Visitor-Serving Commercial Uses include:
 - o Accommodations: 200 gpd/hotel or motel room, RV space, or campsite; does not include restaurants.
 - o Restaurant: 0.6 gpd/SF; Retail: 0.17 gpd/SF
- Essential Services (e.g. schools, government): 2019 actual use: 2040 +25% increase; MTB +50% increase

²⁶ Local Priority Uses:

- Workforce Housing Overlay with Coastal Act Priority Uses: 200 gpd/housing unit (if some units use potable well water, average use of municipal water per unit will be lower)
- Affordable Housing: 200 gpd/housing unit; units include Workforce Housing Overlay units in association with Public Facilities and Institutions land use designation; and inclusionary units required as part of the City's below market rate development requirements at a rate of 20% per development with 10 or more units.

Sewer

**Table B-8. City of Half Moon Bay New Priority Use Sewer Capacity Reserves
(Based on water demand estimate from Table B-7)**

Priority Land Uses:²⁷	2040 gpd/MGY	Maximum Theoretical Buildout gpd/MGY
Coastal Act Priority Uses	89,300/33	145,850/53
Ag. and Ag. Compatible uses		
- Field Agriculture	625	1,250
- Horticulture	1,500	1,850
Coastal Recreation		
- Coastal parks, equestrian	3,125	6,250
Visitor-Serving Commercial		
- Accommodations	40,000	70,000
- Restaurant	18,600	24,000
- Other Commercial	8,600	11,700
Essential Services	8,750	17,500
I&I Factor +10% ²⁸	8,100	13,300
Local Priority Uses	44,000/16	112,200/41
Workforce Housing Overlay w/ Coastal Act Priority Uses	15,000	34,000
Affordable Housing	25,000	68,000
I&I Factor +10%	4,000	10,200
Total Annual Demand		
- gpd	133,320	321,500
- MGY	49	94

²⁷ Discharge Factors:

Coastal Act Priority Uses: Discharge Factors as a percent of water demand:

- Ag and Ag Compatible Uses: 5%
- Coastal Recreation: 50%
- Visitor-Serving Commercial: 100%
- Essential Services: 100%

Local Priority Uses:

- Workforce Housing Overlay with Coastal Act Priority Uses: 100%
- Affordable Housing: 100%

²⁸ I&I Factor: 10% was added to the total for each category to account for Infiltration and Inflow (I&I)

Circulation System

Circulation system modeling for the LUP considered LOS and delay. LOS performance measures range from A to F. While F is the worst grade in the LOS scale, this designation can represent dramatically different levels of delay and gridlock conditions. LOS grades are summarized in Table B-9 for roadway segments.

Table B-9. Roadway Level of Service Criteria – Delay (seconds)

LOS	Description	Two Lane Highways (or rolling terrain w/ 80% no-passing zone)	Multilane Highways (for 50 mph free-flow speed)
A	Free flow operations with average operating speeds at, or above, the speed limit. Vehicles are unimpeded in their ability to maneuver.	0.04	0.30
B	Free flow operations with average operating speeds at the speed limit. Ability to maneuver is slightly restricted. Minor incidents cause some local deterioration in operations.	0.15	0.50
C	Stable operations with average operating speeds near the speed limit. Freedom to maneuver is noticeably restricted. Minor incidents cause substantial local deterioration in service.	0.30	0.70
D	Speeds begin to decline slightly with increasing flows. Freedom to maneuver is more noticeably restricted. Minor incidents create queuing.	0.46	0.84
E	Operations at capacity. Vehicle spacing causes little room to maneuver but speeds exceed 50 miles per hour (mph). Any disruption to the traffic stream can cause a wave of delay that propagates throughout the upstream traffic flow. Minor incidents cause serious breakdown of service with extensive queuing. Maneuverability is extremely limited.	0.90	1.00
F	Operations with breakdowns in vehicle flow. Volumes exceed capacity causing bottlenecks and queue formation.	Greater than 0.90	Greater than 1.00

Source: C/CAG Congestion Management Plan, 2017.

Delay as a factor instead of an amount of time, is a measure that represents actual roadway performance from the perspective of the driver and passengers. Delay factors for a roadway segment are determined relative to the “free flow” condition, which is assigned a measure of 1. Free flow is similar to LOS B, wherein signal light timing is in sync, there is no back up for turn movements, and cars are able to travel at the speed limit. The delay factor is the amount of time it will take to traverse a span of roadway relative to the free flow condition. A delay of 2 indicates that roadway traffic is notable and that the trip will take twice as long as it would in the free flow condition.

LOS and delay factors for the Planning Area are presented in Table B-10 for the weekday and weekend peak periods.

Table B-10. Highway 1 and 92 LOS and Delay Model

Measure	2018	2040	MTB ²⁹
AM Peak Hour (LOS):			
• HWY 1 North	F	F	F
• HWY 1 South	D	D	D
• HWY 92	E	F	F
PM Peak Hour (LOS)			
• HWY 1 North	F	F	F
• HWY 1 South	D	E	E
• HWY 92	E	F	F
Weekend AM Peak Hour (LOS)			
• HWY 1 North	F	F	F
• HWY 1 South	D	D	D
• HWY 92	E	F	F
Weekend PM Peak Hour (LOS)			
• HWY 1 North	F	F	F
• HWY 1 South	D	D	D
• HWY 92	E	F	F
Weekday AM Delay (time factor)			
• HWY 1 North	3.1	4.4	5.1
• HWY 1 South	1.01	1.03	1.03
• HWY 92	1.3	2.0	2.3
Weekday PM Delay (time factor)			
• HWY 1 North	2.9	4.8	5.7
• HWY 1 South	1.01	1.03	1.03
• HWY 92	1.8	3.3	3.9

Sources: Traffic Model: Valley Transportation Authority (VTA)/ San Mateo County Association of Governments (C/CAG) Travel Demand Model; Association of Bay Area Governments (AGAG) Projections 2013 base data for 2018 and 2040 conditions

²⁹ The MTB model inputs included the Half Moon Bay Land Use Plan MTB input with the C/CAG/VTA Travel Demand Model buildout projections for the greater Bay Area through 2040. The C/CAG/VTA Travel Demand Model does not have growth projections past 2040.