

# infrastructure

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Summary

The purpose of this Infrastructure chapter is to **identify potential demand impacts on the City's existing infrastructure based on the proposed changes in land use designations in the Transit Corridors Plan**. The chapter includes a general summary of findings and the suggested infrastructure improvements required for the potential development of the parcels. It also provides a general overview of potential developmental impacts, suggested improvements, and conceptual costs based on the analysis and review of the available data. Additional studies will be required as future development occurs, in order to specifically address the infrastructure demands of new projects and identify infrastructure upgrades needed for the overall collective systems.

This chapter is organized as follows:

- **8.1 Analysis Methodology** - an overview of how the analysis was formed and description of methods and terminology used.
- **8.2 Assessment Analysis Summary** - a summary of the findings and recommendations to mitigate the impact of potential development within the Transit Corridors Area.
- **8.3 Assessment of Additional Upgrades** - a preliminary estimate of upgrades needed for existing underground infrastructure to meet current standards.

## 8.1 ANALYSIS METHODOLOGY

### Limitations and Assumptions

The plan area is divided into five corridors for the purpose of water, sanitary sewer, and storm drainage assessment for the land use demands. Assessments of existing and proposed utility infrastructure demands are limited to the conceptual demands based on the typical industry accepted per acre utility demands for each land use.

The City of San Bruno provided existing utility maps and pipe size data for water, sewer, and storm systems for this analysis. The City was unable to provide capacity information for each individual utility line or system within each of the five corridors. The City assumes that these existing utility lines were sized specifically to serve the existing land uses and are at capacity or close to capacity for the purpose of this analysis and proposed recommendations.

The City of San Bruno and San Mateo County Flood Control District City were also unable to provide capacity data for the existing storm drain systems within the land use study area. However, the updated Master Plan provides recommendations that identify proposed improvements to improve flows and reduce flooding within the study area. The recommendations in this chapter take that information into account. Note that storm runoff calculations for existing and proposed development are based on a 10-year storm requirement as defined by the Hydrology and Hydraulics Criteria for San Mateo County Flood Control District. It is assumed these lines are currently serving each corridor's existing drainage needs. Any additional runoff flows generated for the proposed land uses will require some onsite detention and/or retention system to reduce flow volume into the existing systems.

## Analysis Method

The following methods were used for calculating demands for sanitary sewer, water and stormwater in the Transit Corridors Plan area. Note: see the Appendix D for the tables and data cited in this section.

### 1. Sanitary Sewer Formula:

The existing and proposed sanitary sewer demands were calculated using the product of the typical industry standard Sewer Discharge by Usage and the acreage of the land use defined by City of San Bruno Existing Land Use / Zoning Designations (see Figure 8.1 - Existing Zoning Acreages). The results are expressed in Gallons Per Day (GPD).

$(\text{Discharge (GPAD)}) * (\text{Acreage}) = \text{Demand (GPD)}$

### 2. Water Formula:

The existing and proposed water demands were calculated using the product of the typical industry standard Water Duties for Land Classifications values defined and the acreage of the land use, defined by City of San Bruno Existing Land Use / Zoning Designations. The results are expressed in Gallons Per Day (GPD).

$(\text{Water Demand (GPAD)}) * (\text{Acreage}) = \text{Demand (GPD)}$

### 3. Stormwater Formula:

The existing and proposed storm drainage demands were calculated using the Hydrology and Hydraulics Criteria Summary for San Mateo County Flood Control District Rain Fall Intensity Chart and runoff coefficient values as shown on the typical industry standard Storm Drainage Runoff Coefficient.

Rational Method  $Q = CIA$

$Q = \text{Flow CFS}$

$C = \text{Run Off Coefficient}$

I = Rain Fall Intensity inches per hour

A = Acreage

I = Product of (unit of rain fall intensity) (mean annual precipitation)

C = Based on existing and proposed Land Use Designations

Note: Time of Concentration (15 minutes) used for paved areas at 2% – 6 % w/ Flow Path at 100' – 500'.

### References

1. Hydrology and Hydraulics Criteria for San Mateo County
2. City of San Bruno Water System Master Plan 2002 update
3. City of San Bruno Sanitary Sewer Master Plan update
4. City of San Bruno Drainage Master Plan 2001 update
5. Highway Design Manual, 6th Edition (September 1, 2006), California Department of Transportation (CALTRANS)

### Acronyms

CFS - cubic feet per second

GPD - gallons per day

GPAD - gallons per acre per day

## 8.2 ASSESSMENT ANALYSIS SUMMARY

The analysis of the impacts for the proposed land use designations for the potential development areas are organized into five corridors as follows: the San Mateo Avenue (North); San Mateo Avenue (South); El Camino Real (South); El Camino Real (North); and San Bruno Avenue (see Figure 8.1 - Existing Zoning Acreages and Figure 8.2 - Parcels Identified for Potential Development or Redevelopment).

The existing utility conditions for these corridors are problematic and have been identified in the City of San Bruno Water, Wastewater, Drainage Master Plan updates (See Appendix : Existing Conditions Report for additional information and infrastructure maps). The proposed land use designation changes for these corridors will significantly impact the existing water and sewer systems. However, the utility upgrades proposed by the Master Plan updates should ultimately support these proposed land uses under the current projected 2030 Water Master Plan and 2025 Wastewater Master Plan demands. In comparison, the Drainage System impact will be minor. However, the existing deficiencies need to be corrected as identified by the City recommendations in the Drainage Master Plan 2001 update. The findings are summarized by corridor demand impacts and assume that the City will have the recommended improvements implemented by 2030.

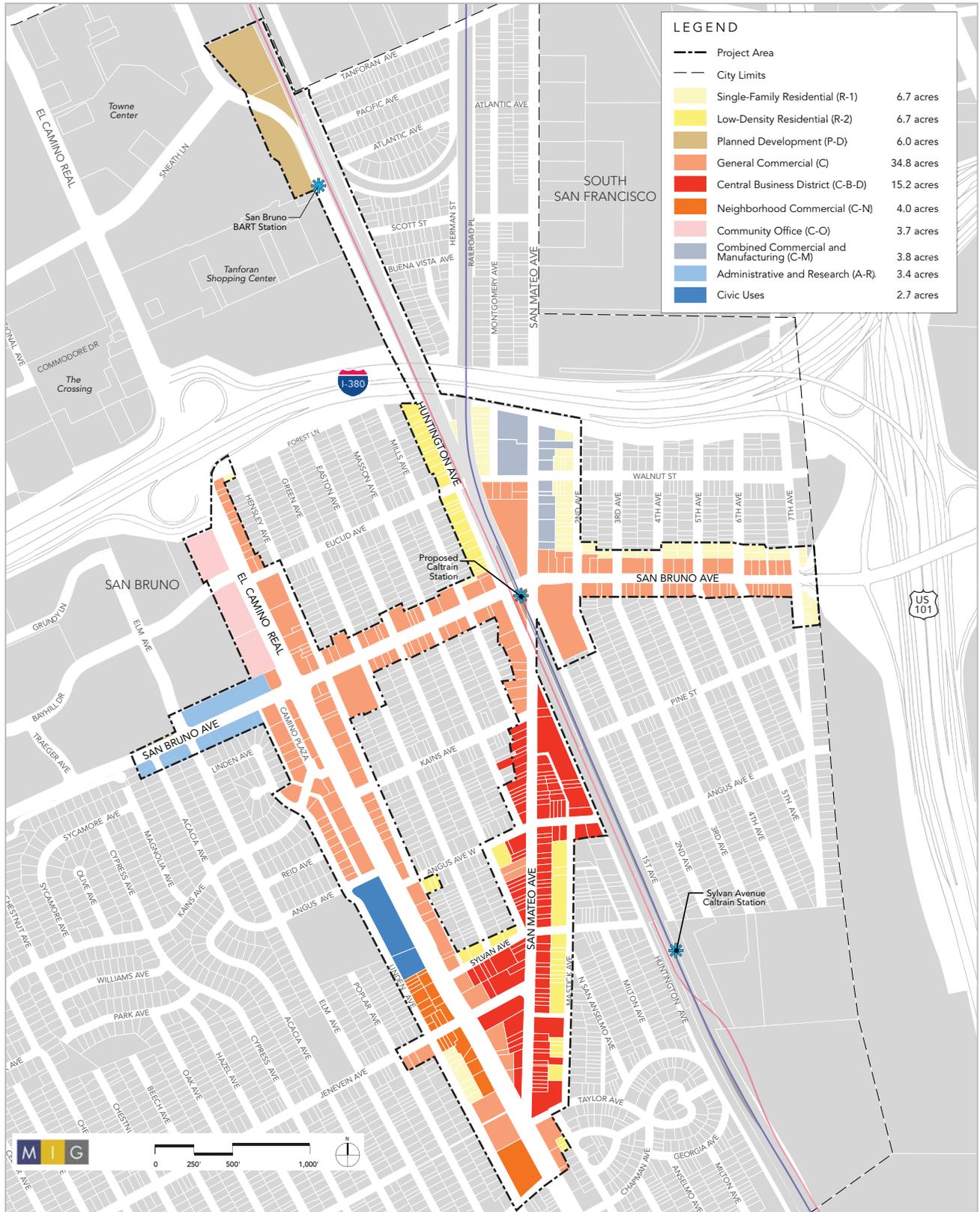


Figure 8.1 - Existing Zoning Acreages

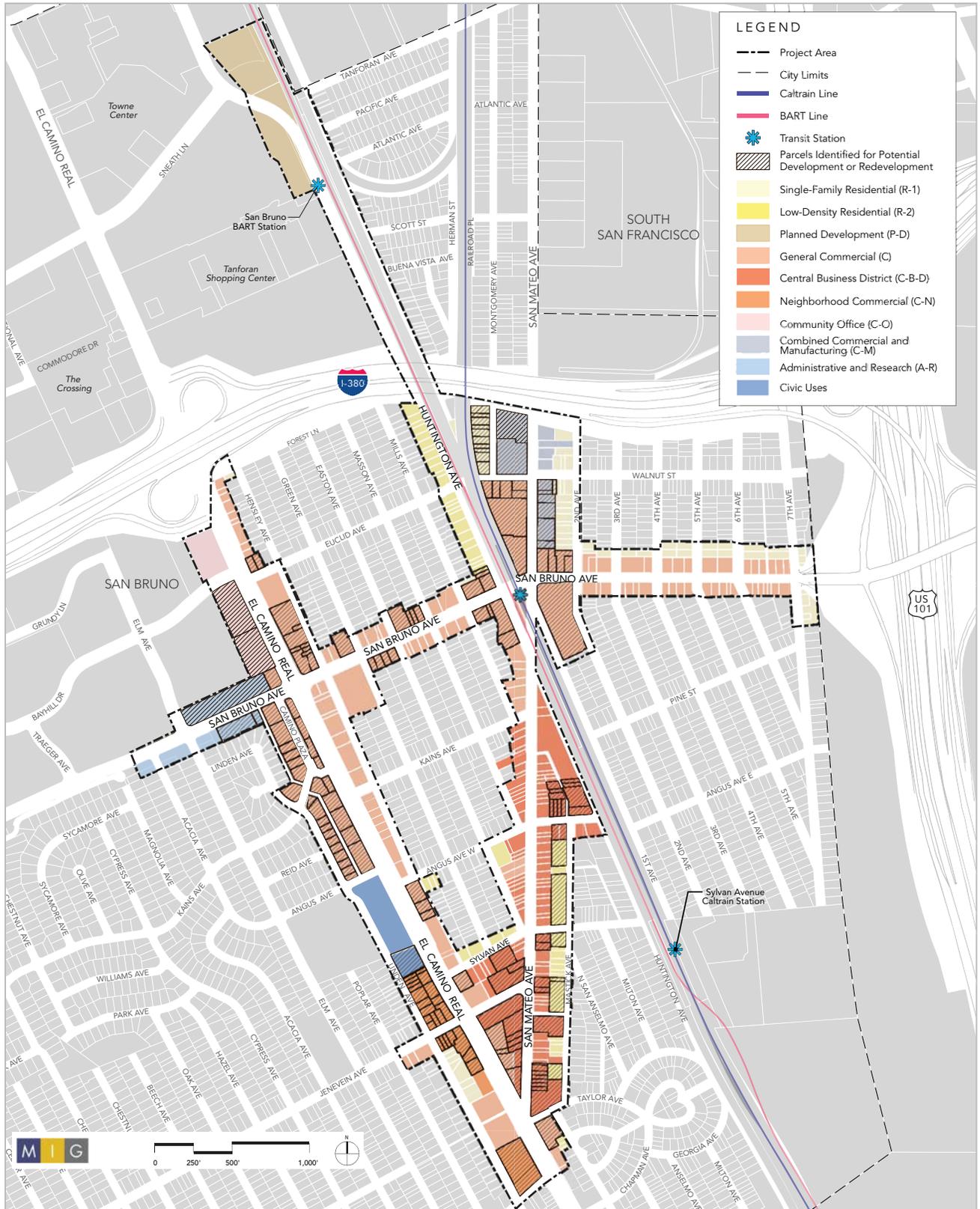


Figure 8.2 - Parcels Identified for Potential Development or Redevelopment

### **Projected Infrastructure Demand Summary**

Tables 8.1 - 8.3 summarize the projected impact related to stormwater runoff, water, and sewer infrastructure at buildout within the Transit Corridors Area. The following sections describe the projected increased demand in further detail.

Table 8.1: Summary - Stormwater Runoff Demands

Corridor	Existing Demand (CFS)	Proposed Demand (CFS)	Increase in Demand (CFS)
San Mateo Ave (North)	13.18	15.71	2.53
San Mateo Ave (South)	10.89	14.14	3.25
El Camino Real (North)	16.48	17.60	1.12
El Camino Real (South)	7.58	8.74	1.16
San Bruno Ave	4.18	4.88	0.7
<b>TOTAL</b>	<b>52.31</b>	<b>61.07</b>	<b>8.76</b>

Table 8.2: Summary - Water Demands

Corridor	Existing Demand (GPD)	Proposed Demand (GPD)	Increase in Demand (GPD)	Increase in Demand (MGD)
San Mateo Ave (North)	11,625	24,720	13,095	0.013
San Mateo Ave (South)	12,500	28,560	16,060	0.016
El Camino Real (North)	14,690	45,785	31,095	0.031
El Camino Real (South)	6,720	20,210	13,490	0.013
San Bruno Ave	3,720	10,310	6,590	0.007
<b>TOTAL</b>	<b>49,255</b>	<b>129,585</b>	<b>80,330</b>	<b>0.080</b>

Table 8.3: Summary - Sewer Demands

Corridor	Existing Demand (GPD)	Proposed Demand (GPD)	Increase in Demand (GPD)	Increase in Demand (MGD)
San Mateo Ave (North)	8,720	36,700	27,980	0.028
San Mateo Ave (South)	8,931	37,212	28,281	0.028
El Camino Real (North)	10,956	67,200	56,244	0.056
El Camino Real (South)	4,928	28,102	23,174	0.023
San Bruno Ave	2,910	11,400	8,490	0.008
<b>TOTAL</b>	<b>36,445</b>	<b>180,614</b>	<b>144,169</b>	<b>0.143</b>



	Parcels Identified for Potential Development or Redevelopment
	Single-Family Residential (R-1)
	Low-Density Residential (R-2)
	Planned Development (P-D)
	General Commercial (C)
	Central Business District (C-B-D)
	Neighborhood Commercial (C-N)
	Community Office (C-O)
	Combined Commercial and Manufacturing (C-M)
	Administrative and Research (A-R)
	Civic Uses

## San Mateo Avenue Corridor (North)

### Finding Summary

#### Impacts

- Water will be increased 1.1 times the current demand.
- Sanitary Sewer will be increased three times the current demand.
- Stormwater increase will have a minor impact

#### Recommendations

The proposed grade separation project planned along the Huntington Avenue/San Mateo Avenue/Interstate 380 corridor will be to relocate and upsize the sewer, water and storm systems within the project limits. The following upgrades are recommended to be coordinated with this project:

**Water:** It is anticipated that the construction of a new water line will be required to accommodate new development. This would include a 12" water main of approximately 1,000 LF. south along the San Mateo Avenue (North) Corridor, approximately 1,800 LF west along the San Bruno Avenue Corridor, and approximately 600 LF south to connect to the existing 12" water main in El Camino Real. This system should eventually "loop" the San Mateo (North and South) Corridors, the El Camino Real (South and North) Corridors, and the San Bruno Corridor. Estimated cost is \$1.3 million.

**Sanitary Sewer:** It is anticipated that the construction of a new 18" SS trunk line of approximately 2,200 LF along Huntington and San Mateo avenues from the existing 18" SS trunk line at the intersection of Huntington and Angus avenues to the intersection of Walnut and San Mateo avenues will be needed to accommodate new development. Estimated cost is \$1 million.

**Storm Drain:** The increase in demand is based on land use runoff coefficients; actual anticipated runoff could go down with mitigation measures and detention/retention requirements placed on future developers by the City.

**Table 8.4: Potential Development Parcels Stormwater Runoff Demands. San Mateo Avenue Corridor (North)**

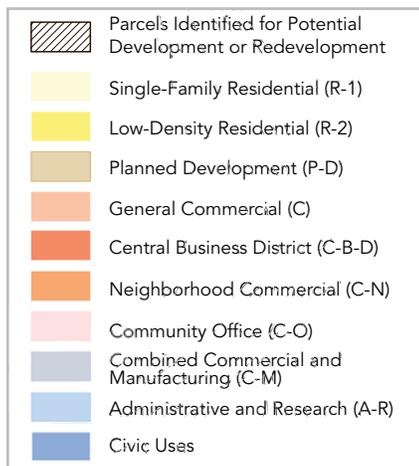
Existing Land Use	Existing Acreage	Existing Storm Demand (CFS)	Proposed Land Use	Acreage	Proposed Storm Demand (CFS)	Street Name and Ex. SD Line
C-M Zoning Com. Commercial / Industrial	1.9	2.56	Office Commercial (High Density)	1.9	3.08	San Mateo Ave. 12" SD
R-1 Zoning Single Family Residential	1.0	1.08	Office Commercial (High Density)	1.0	1.62	San Mateo Ave. 12" SD; Huntington Ave. SD Trunk size unknown
C-M and C Zoning Com. Commercial / Industrial and Gen. Commercial	2.0	3.06	Mixed Use Office /Retail (High Density)	2.0	3.24	San Mateo Ave. 12" SD; San Bruno Ave. 12" SD; Huntington Ave. SD Trunk size unknown
C Zoning Gen. Commercial	2.6	3.51	Mixed Use Office / Retail (High Density)	2.6	4.21	San Mateo Ave. 12" SD; San Bruno Ave. 12" SD; Huntington Ave. SD Trunk size unknown
C Zoning Gen. Commercial	2.2	2.97	Mixed Use Office / Retail / Residential (High Density)	2.2	3.56	San Mateo Ave. 12" SD; San Bruno Ave. 12" SD; Huntington Ave. SD Trunk size unknown
<b>Total</b>	<b>9.7</b>	<b>13.18</b>	<b>Total</b>	<b>9.7</b>	<b>15.71</b>	

Table 8.5: Potential Development Parcels Water Demands. San Mateo Avenue Corridor (North)

Existing Land Use	Existing Acreage	Existing Water Demand (GPD)	Proposed Land Use	Acreage	Proposed Water Demand (GPD)	Street Name and Ex. Water Line
C-M Zoning Com. Commercial / Industrial	1.9	1,615	Office Commercial (High Density)	1.9	4,465	San Mateo 8" W; Walnut St. 8" W; Montgomery Ave. 4" W and 2" W
R-1 Zoning Single Family Residential	1.0	1,850	Office Commercial (High Density)	1.0	2,350	Montgomery Ave. 4" W and 2" W; Huntington 6" W
C-M and C Zoning Com. Commercial / Industrial and Gen. Commercial	2.0	2,400	Mixed Use Office / Retail (High Density)	2.0	4,700	San Mateo 8" W; Walnut St. 8" W; 2nd Ave 6" W; San Bruno Ave 6" W
C Zoning Gen. Commercial	2.6	3,120	Mixed Use Office / Retail (High Density)	2.6	6,110	San Mateo 8" W; Walnut St. 8" W Huntington Ave 6" W
C Zoning Gen. Commercial	2.2	2,640	Mixed Use Office / Retail / Residential (High Density)	2.2	7,095	San Mateo 8" W; 2nd St 6" W; Huntington Ave 8" W; San Bruno 6"W
<b>Total</b>	<b>9.7</b>	<b>11,625</b>	<b>Total</b>	<b>9.7</b>	<b>24,720</b>	

**Table 8.6: Potential Development Parcels Sanitary Sewer Demands. San Mateo Avenue Corridor (North)**

Existing Land Use	Existing Acreage	Existing Sewer Demand (GPD)	Proposed Land Use	Acreage	Proposed Sewer Demand (GPD)	Street Name and Ex. Sewer Line
<b>C-M Zoning Com. Commercial / Industrial</b>	1.9	1,596	Office Commercial (High Density)	1.9	6,650	San Mateo Ave. 5" and 6" SS; Walnut St. 5" SS; Montgomery Ave. 5" SS
<b>R-1 Zoning Single Family Residential</b>	1.0	1,140	Office Commercial (High Density)	1.0	3,500	Walnut St. 5" SS; Montgomery Ave. 5" SS; Huntington Ave. 8" SS
<b>C-M and C Zoning Com. Commercial / Industrial and Gen. Commercial</b>	2.0	1,760	Mixed Use Office / Retail (High Density)	2.0	7,000	San Mateo Ave. 6" SS; Walnut St. 6" SS; San Bruno Ave. 6" SS; 2nd Ave. 5" SS
<b>C Zoning Gen. Commercial</b>	2.6	2,288	Mixed Use Office / Retail (High Density)	2.6	9,100	San Mateo Ave. 6" SS; Walnut St. 5" SS; San Bruno Ave 6" SS; Huntington Ave. 8" SS
<b>C Zoning Gen. Commercial</b>	2.2	1,936	Mixed Use Office / Retail / Residential (High Density)	2.2	10,450	Huntington Ave. 5" SS and 8" SS; San Bruno Ave 6" SS; 2nd Ave. 5" SS
<b>Total</b>	9.7	8,720	Total	9.7	36,700	



### San Mateo Avenue Corridor (South)

#### Impacts

- Water will be increased 1.3 times the current demand.
- Sanitary Sewer will be increased three times the current demand.
- Stormwater increase will have a minor impact.

#### Recommendations

**Water:** It is anticipated that the construction of a new 12" water main will be required to accommodate new construction. This would include approximately 3,600 LF starting from the future stub at the intersection of San Mateo Avenue and San Bruno Avenue south along the San Mateo Avenue (South) Corridor to connect to the existing 12" water main in El Camino Real (South) Corridor. This system should eventually "loop" the San Mateo (North and South) Corridors, the El Camino Real (South and North) Corridors, and the San Bruno Corridor. The estimated cost is \$1.4 million.

**Sanitary Sewer:** It is anticipated that the construction of a new 18" SS trunk line will be required to accommodate new construction. This would include approximately 2,000 LF from the intersection of El Camino Real and San Mateo Avenue running north along the San Mateo Avenue and connecting to the existing 18" SS trunk line at the intersection of Angus Avenue and San Mateo Avenue. It is suggested to incorporate this improvement into the City's Rehabilitation Program Project which is planned to eliminate the existing 4" Sewer line running parallel to Mastick Avenue in the alley (Mid Block). The estimated cost is \$900,000.

**Storm Drain:** The increase in demand is based on land use runoff coefficients; actual anticipated runoff could go down with mitigation measures and detention/retention requirements placed on future developers by the City.

**Table 8.7: Potential Development Parcels Stormwater Runoff Demands. San Mateo Avenue Corridor (South)**

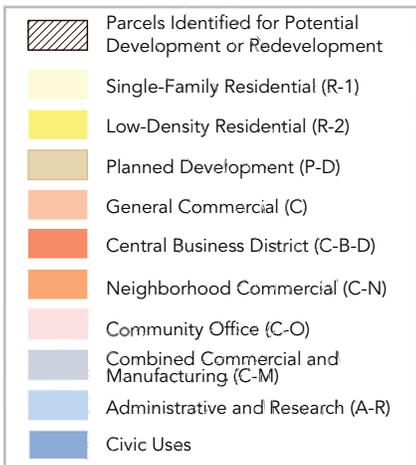
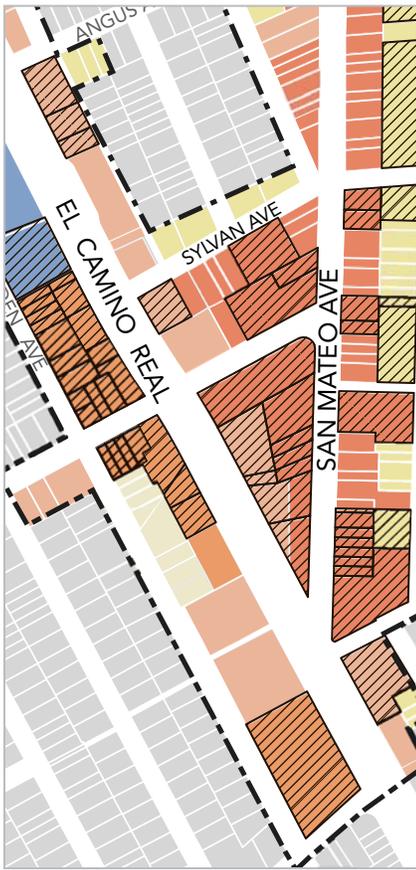
Existing Land Use	Existing Acreage	Existing Storm Demand (CFS)	Proposed Land Use	Acreage	Proposed Storm Demand (CFS)	Street Name and Ex. SD Line
<b>CBD Zoning Central Business District</b>	1.2	1.62	Public Parking Garage	1.2	1.94	San Mateo Ave. 10" SD; Angus Ave. 4x6 Culvert; Huntington 4x8 Culvert
<b>R-2 Zoning Low Density Residential</b>	0.6	0.65	Residential (High Density)	0.6	0.92	San Mateo Ave. 6x4 Culvert; Angus Ave. 4x6 Culvert
<b>R-2 Zoning Low Density Residential</b>	0.7	0.76	Residential (High Density)	0.7	1.07	San Mateo Ave. 10" SD
<b>R-2 and CBD Zoning Low Density Residential / Central Business District</b>	0.4	0.43	Mixed Use Retail / Residential (Med./ Multi Family Density)	0.4	0.65	San Mateo Ave. 10" SD; San Mateo Ave 6x4 Culvert
<b>R-2 and CBD Zoning Low Density Residential / Central Business District</b>	0.7	0.76	Mixed Use Retail / Residential (High/ Multi Family Density)	0.7	1.13	San Mateo Ave. 10" SD
<b>CBD Zoning Central Business District</b>	0.5	0.68	Mixed Use Retail / Residential (Med./ Multi Family Density)	0.5	0.81	San Mateo Ave. 10" SD
<b>R-2 and CBD Zoning Low Density Residential / Central Business District</b>	1.3	1.4	Mixed Use Retail / Residential (Multi Family/High Density)	1.3	2.11	El Camino 10" SD; Alley 10" SD
<b>C and CBD Zoning Gen. Commercial / Central Business District</b>	2.4	3.24	Mixed Use Retail / Residential / Institutional (High Density)	2.4	3.89	San Mateo Ave. 10" SD; El Camino 10" SD
<b>CBD Zoning Central Business District</b>	1.0	1.35	Mixed Use Hotel / Commercial (High Density)	1.0	1.62	San Mateo Ave. 10" SD
<b>Total</b>	<b>8.8</b>	<b>10.89</b>	<b>Total</b>	<b>8.8</b>	<b>14.14</b>	

Table 8.8: Potential Development Parcels Water Demands. San Mateo Avenue Corridor (South)

Existing Land Use	Existing Acreage	Existing Water Demand (GPD)	Proposed Land Use	Acreage	Proposed Water Demand (GPD)	Street Name and Ex. Water Line
CBD Zoning Central Business District	1.2	1,740	Public Parking Garage	1.2	1,200	Huntington Ave. 8" W; Angus Ave. 8" and 4" W; Alley 2" W
R-2 Zoning Low Density Residential	0.6	750	Residential (High Density)	0.6	2,460	Angus Ave. 8" and 4" W; Mastick Ave. 2" W and 4" W
R-2 Zoning Low Density Residential	0.7	875	Residential (High Density)	0.7	2,870	Mastick Ave. 2" W and 4" W; Sylvan Ave. 4" W
R-2 and CBD Zoning Low Density Residential / Central Business District	0.4	580	Mixed Use Retail / Residential (Med./Multi Family Density)	0.4	840	Mastick Ave. 2" W, 12" W, 4" W; Sylvan Ave. 4" W; San Mateo 8" W
R-2 and CBD Zoning Low Density Residential / Central Business District	0.7	1,015	Mixed Use Retail / Residential (High/Multi Family Density)	0.7	2,170	Mastick Ave. 2" W, 12" W; San Mateo 8" W; Alley 12" W
CBD Zoning Central Business District	0.5	725	Mixed Use Retail / Residential (Med./Multi Family Density)	0.5	1,050	Mastick Ave. 2" W, 12" W; San Mateo 8" W; Alley 12" W
R-2 and CBD Zoning Low Density Residential / Central Business District	1.3	1,885	Mixed Use Retail / Residential (Multi Family/High Density)	1.3	4,030	Mastick Ave. 2" W, 8" W; San Mateo 8" W; Taylor Ave. 8" W and 2" W
C and CBD Zoning Gen. Commercial / Central Business District	2.4	3,480	Mixed Use Retail / Residential / Institutional (High Density)	2.4	9,840	San Mateo 8" W; El Camino 12" W and 8" W; Jenevein Ave. 8" W
CBD Zoning Central Business District	1.0	1,450	Mixed Use Hotel / Commercial (High Density)	1.0	4,100	San Mateo 8" W; Jenevein Ave. 8" W; Sylvan Ave. 4" W
<b>Total</b>	<b>8.8</b>	<b>12,500</b>	<b>Total</b>	<b>8.8</b>	<b>28,560</b>	

**Table 8.9: Potential Development Parcels Sewer Demands. San Mateo Avenue Corridor (South)**

Existing Land Use	Existing Acreage	Existing Sewer Demand (GPD)	Proposed Land Use	Acreage	Proposed Sewer Demand (GPD)	Street Name and Ex. Sewer Line
<b>CBD Zoning Central Business District</b>	1.2	1,320	Public Parking Garage	1.2	1,176	Huntington Ave. 8" SS, 6" SS, and 10" SS; Angus Ave. 10" SS, 18 SS; Alley 10" SS
<b>R-2 Zoning Low Density Residential</b>	0.6	270	Residential (High Density)	0.6	3,600	Angus Ave. 10" SS, 18 SS; Mastick Ave. 6" SS
<b>R-2 Zoning Low Density Residential</b>	0.7	315	Residential (High Density)	0.7	4,200	Mastick Ave. 6" SS; Sylvan Ave. 6" SS
<b>R-2 and CBD Zoning Low Density Residential / Central Business District</b>	0.4	456	Mixed Use Retail / Residential (Med./ Multi Family Density)	0.4	816	Mastick Ave. 6" SS; Sylvan Ave. 6" SS; Alley 6" SS; San Mateo Ave. 6" SS
<b>R-2 and CBD Zoning Low Density Residential / Central Business District</b>	0.7	798	Mixed Use Retail / Residential (High/Multi Family Density)	0.7	2,100	Mastick Ave. 6" SS; Alley 6" SS; San Mateo Ave. 6" SS
<b>CBD Zoning Central Business District</b>	0.5	550	Mixed Use Retail / Residential (Med./ Multi Family Density)	0.5	1,020	Mastick Ave. 6" SS; Alley 6" SS; San Mateo Ave. 6" SS
<b>R-2 and CBD Zoning Low Density Residential / Central Business District</b>	1.3	1,482	Mixed Use Retail / Residential (Multi Family/High Density)	1.3	3,900	Mastick Ave. 6" SS; Taylor Ave. 10" SS; San Mateo Ave. 6" SS; El Camino Real 8" SS
<b>C and CBD Zoning Gen. Commercial / Central Business District</b>	2.4	2,640	Mixed Use Retail / Residential / Institutional (High Density)	2.4	14,400	Taylor Ave. 10" SS; San Mateo Ave. 6" SS; EL Camino 6" and 8" SS; Jenevein Ave. 6" SS
<b>CBD Zoning Central Business District</b>	1.0	1,100	Mixed Use Hotel / Commercial (High Density)	1.0	6,000	Jenevein Ave. 6" SS; San Mateo Ave. 6" SS; Sylvan Ave. 6" SS
<b>Total</b>	<b>8.8</b>	<b>8,931</b>	<b>Total</b>	<b>8.8</b>	<b>37,212</b>	



### El Camino Real Corridor (South)

#### Impacts

- Water will be increased two times the current demand.
- Sanitary Sewer will be increased 4.7 times the current demand.
- Stormwater increase will have a minor impact .

#### Recommendations

**Water:** The newly constructed 12" water main loop will provide adequate capacity for future development along the El Camino Real (South) and El Camino (North) Corridors. This system should eventually "loop" the San Mateo (North and South) Corridors, the El Camino Real (South and North) Corridors, and the San Bruno Corridor.

**Sanitary Sewer:** It is anticipated that new development will require a new 15" SS trunk line, approximately 850 LF from the intersection of El Camino Real and Jenevein Avenue running south along El Camino Real to connect to the new 18" SS trunk line at the intersection of El Camino Real and San Mateo Avenue. This estimated cost is \$400,000.

**Storm Drain:** The increase in demand is based on land use runoff coefficients; actual anticipated runoff could go down with mitigation measures and detention/retention requirements placed on future developers by the City.

**Table 8.10: Potential Development Parcels Stormwater Runoff Demands. El Camino Real Corridor (South)**

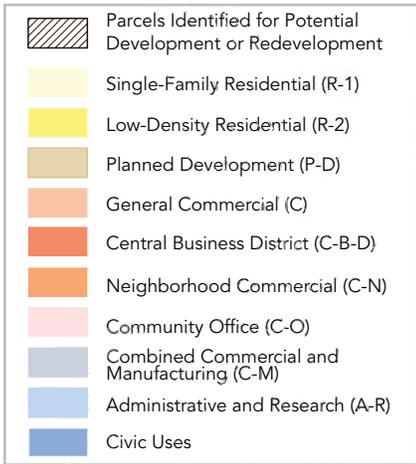
Existing Land Use	Existing Acreage	Existing Storm Demand (CFS)	Proposed Land Use	Acreage	Proposed Storm Demand (CFS)	Street Name and Ex. SD Line
<b>C Zoning Gen. Commercial</b>	0.5	0.68	Public Parking Garage	0.5	0.81	Mastick Ave. 5x8 Culvert, 6x4 Culvert; El Camino 10" SD
<b>C-N Zoning Neighborhood Commercial</b>	1.3	1.76	Mixed Use Retail / Residential (High Density)	1.3	2.11	Linden Ave. 10" SD; El Camino 10" SD, 6x4 Culvert
<b>C-N Zoning Neighborhood Commercial</b>	0.9	1.22	Residential (High Density)	0.9	1.38	Linden Ave. 10" SD; El Camino 10" SD
<b>C-N and O Zoning Neighborhood Commercial / Open Space</b>	2.0	2.70	Residential (High Density)	2.0	3.06	Linden Ave. 10" SD, 3x10 Culvert; El Camino 5x9 Culvert
<b>C Zoning Gen. Commercial</b>	0.3	0.41	Residential (Med./ Multi Family Density)	0.3	0.46	San Mateo Ave. 10" SD; El Camino 5x9 Culvert
<b>C Zoning Gen. Commercial</b>	0.6	0.81	Residential (Multi Family/High Density)	0.6	0.92	El Camino 5x9 Culvert
<b>Total</b>	5.6	7.58	Total	5.6	8.74	

**Table 8.11: Potential Development Parcels Water Demands. El Camino Real Corridor (South)**

Existing Land Use	Existing Acreage	Existing Water Demand (GPD)	Proposed Land Use	Acreage	Proposed Water Demand (GPD)	Street Name and Ex. Water Line
C Zoning Gen. Commercial	0.5	600	Public Parking Garage	0.5	500	Mastick Ave. 2" W, 8"W; San Mateo 8" W; Taylor Ave. 8" W and 2" W; El Camino 12" W and 8" W
C-N Zoning Neighborhood Commercial	1.3	1,560	Mixed Use Retail / Residential (High Density)	1.3	5,330	El Camino 12" W and 8" W; Crystal Springs RD. 6" W; Linden Ave. 4" W and 2" W
C-N Zoning Neighborhood Commercial	0.9	1,080	Residential (High Density)	0.9	3,690	El Camino 12" W and 8" W; Jenevein Ave. 10" W and 8" W; Linden Ave. 4" W and 2" W
C-N and O Zoning Neighborhood Commercial / Open Space	2.0	2,400	Residential (High Density)	2.0	8,200	El Camino 12" W and 4" W; Jenevein Ave. 10" W and 8" W; Linden Ave. 4" W and 2" W
C Zoning Gen. Commercial	0.3	360	Residential (Med./ Multi Family Density)	0.3	630	El Camino 12" W; Sylvan Ave. 4" W
C Zoning Gen. Commercial	0.6	720	Residential (Multi Family/High Density)	0.6	1,860	El Camino 4" W, 12 W and 2"; Angus Ave. 4" W
<b>Total</b>	<b>5.6</b>	<b>6,720</b>	<b>Total</b>	<b>5.6</b>	<b>20,210</b>	

**Table 8.12: Potential Development Parcels Sanitary Sewer Demands. El Camino Real Corridor (South)**

Existing Land Use	Existing Acreage	Existing Sewer Demand (GPD)	Proposed Land Use	Acreage	Proposed Sewer Demand (GPD)	Street Name and Ex. Sewer Line
C Zoning Gen. Commercial	0.5	440	Public Parking Garage	0.5	490	Mastick Ave. 6" SS; Taylor Ave. 10" SS; El Camino 8" SS
C-N Zoning Neighborhood Commercial	1.3	1,144	Mixed Use Retail / Residential (High Density)	1.3	7,800	El Camino 8" SS; Crystal Springs RD. 8" SS; Linden Ave. 6" SS
C-N Zoning Neighborhood Commercial	0.9	792	Residential (High Density)	0.9	5,400	El Camino 6" SS, 8" SS; Jenevein Ave. 6" SS; Linden Ave. 6" SS
C-N and O Zoning Neighborhood Commercial / Open Space	2.0	1,760	Residential (High Density)	2.0	12,000	El Camino 14" SS; Jenevein Ave. 6" SS and 10" SS; Linden Ave. 6" SS and 10" SS
C Zoning Gen. Commercial	0.3	264	Residential (Med./ Multi Family Density)	0.3	612	Sylvan Ave. 6" SS
C Zoning Gen. Commercial	0.6	528	Residential (Multi Family/High Density)	0.6	1,800	Angus Ave. 6" SS and 14" SS; El Camino 14" SS; Alley 6" SS
<b>Total</b>	<b>5.6</b>	<b>4,928</b>	<b>Total</b>	<b>5.6</b>	<b>28,102</b>	



## El Camino Real Corridor (North)

### Impacts

- Water will be increased two times the current demand.
- Sanitary Sewer will be increased five times the current demand.
- Stormwater increase will have a minor impact.

### Recommendations

**Water:** The newly constructed 12" water main loop will provide adequate capacity for future development along the El Camino Real (South) and El Camino (North) Corridors. This system should eventually "loop" the San Mateo (North and South) Corridors, the El Camino Real (South and North) Corridors, and the San Bruno Corridor.

**Sanitary Sewer:** It is anticipated that new construction will require a new 18" SS trunk line, approximately 2,400 LF from the intersection of El Camino Real and Kains Avenue running north along El Camino Real to connect to the existing 18" SS trunk line at the intersection of El Camino Real and Bay Hill Drive. The estimated cost is \$1.1 million.

**Storm Drain:** The increase in demand is based on land use runoff coefficients; actual anticipated runoff could go down with mitigation measures and detention/retention requirements placed on the developers by the City.

**Table 8.13: Potential Development Parcels Stormwater Runoff Demands. El Camino Real Corridor (North)**

Existing Land Use	Existing Acreage	Existing Storm Demand (CFS)	Proposed Land Use	Acreage	Proposed Storm Demand (CFS)	Street Name and Ex. SD Line
C Zoning Gen. Commercial	0.2	0.27	Residential (High Density)	0.2	0.31	El Camino Trunk size unknown
C Zoning Gen. Commercial	1.5	2.03	Mixed Use Hotel / Commercial / Residential (High Density)	1.5	2.30	El Camino 10x7 Culvert, Trunk size unknown; San Bruno Ave. 15" SD
C Zoning Gen. Commercial	1.6	2.16	Residential (High Density)	1.6	2.45	Kains Ave. 12" SD; Angus Ave. Trunk size unknown
C Zoning Gen. Commercial	1.1	1.49	Residential (High Density)	1.1	1.68	Kains Ave. 12" SD; Angus Ave. Trunk & Linden Ave. Trunk sizes unknown
C Zoning Gen. Commercial	0.6	0.81	Residential (High Density)	0.6	0.92	Kains Ave. 12" SD; Camino Plaza Trunk size unknown; El Camino Real 10x7 Culvert
C Zoning Gen. Commercial	0.6	0.81	Mixed Use Retail / Residential (High Density)	0.6	0.92	Kains Ave. 12" SD; Camino Plaza Trunk size unknown; El Camino Real 10x7 Culvert
C Zoning Gen. Commercial	0.6	0.81	Residential (High Density)	0.6	0.92	San Bruno Ave. 10x7 Culvert; Camino Plaza Trunk size unknown
A-R Zoning Admin. – Research	0.8	1.30	Residential (High Density)	0.8	1.30	Linden Ave. 12" SD; San Bruno Ave. 10x7 Culvert; Trunk size unknown
C-O, C, and A-R Zoning Community Office / Gen. Commercial / Admin. – Research	4.2	6.80	Mixed Use Retail / Residential (High Density)	4.2	6.80	El Camino Trunk size unknown; San Bruno Ave. 10x7 Culvert; Parking Lot 10" SD
<b>Total</b>	<b>11.2</b>	<b>16.48</b>	<b>Total</b>	<b>11.2</b>	<b>17.60</b>	

**Table 8.14: Potential Development Parcels Water Demands. El Camino Real Corridor (North)**

Existing Land Use	Existing Acreage	Existing Water Demand (GPD)	Proposed Land Use	Acreage	Proposed Water Demand (GPD)	Street Name and Ex. Water Line
C Zoning Gen. Commercial	0.2	240	Residential (High Density)	0.2	820	El Camino 8" W ; Euclid Ave. 6" W and 2" W
C Zoning Gen. Commercial	1.5	1,800	Mixed Use Hotel / Commercial / Residential (High Density)	1.5	6,150	El Camino 8" W, 6" W, 4" W and 2" W; Hensley Ave. 6" W, 4" W, and 2" W; San Bruno Ave. 6" W and
2" W	1.6	2.16	Residential (High Density)	1.6	2.45	Kains Ave. 12" SD; Angus Ave. Trunk size unknown
C Zoning Gen. Commercial	1.6	1,920	Residential (High Density)	1.6	6,560	El Camino 12" W and 2" W; Kains Ave. 2" W, 8" W; Angus Ave. 2" W
C Zoning Gen. Commercial	1.1	1,320	Residential (High Density)	1.1	4,510	Kains Ave. 8" W and 2" W; Angus Ave. 2" W; Linden Ave. 4" W and 2" W
C Zoning Gen. Commercial	0.6	720	Residential (High Density)	0.6	2,460	Kains Ave. 8" W and 2" W; Linden Ave. 6" W and 2" W; Camino Plaza 8" W; El Camino Real 12" W
C Zoning Gen. Commercial	0.6	720	Mixed Use Retail / Residential (High Density)	0.6	2,460	Camino Plaza 8" W; El Camino 12" W; San Bruno Ave. 6" W and 2" W
C Zoning Gen. Commercial	0.6	720	Residential (High Density)	0.6	2,325	Camino Plaza 8" W; San Bruno Ave. 6" W and 2" W
A-R Zoning Admin. – Research	0.8	1,160	Residential (High Density)	0.8	3,280	San Bruno Ave. 6" W and 2" W; Camino Plaza 8" W
C-O, C, and A-R Zoning Community Office / Gen. Commercial / Admin. – Research	4.2	6,090	Mixed Use Retail / Residential (High Density)	4.2	17,220	San Bruno Ave. 6" W and 2" W; Alley 8" W; Bay Hill DR. 8" W and 10" W
<b>Total</b>	<b>11.2</b>	<b>14,690</b>	<b>Total</b>	<b>11.2</b>	<b>45,785</b>	

**Table 8.15: Potential Development Parcels Sanitary Sewer Demands. El Camino Real Corridor (North)**

Existing Land Use	Existing Acreage	Existing Sewer Demand (GPD)	Proposed Land Use	Acreage	Proposed Sewer Demand (GPD)	Street Name and Ex. Sewer Line
C Zoning Gen. Commercial	0.2	176	Residential (High Density)	0.2	1,200	El Camino 6" SS and 18" SS; Euclid Ave. 6" SS
C Zoning Gen. Commercial	1.5	1,320	Mixed Use Hotel / Commercial / Residential (High Density)	1.5	9,000	San Bruno 6" SS; Hensley Ave. 6" SS
C Zoning Gen. Commercial	1.6	1,408	Residential (High Density)	1.6	9,600	Kains Ave 6" SS; El Camino 6" SS; Alley 10" SS and 6" SS; Camino Plaza 6" SS
C Zoning Gen. Commercial	1.1	968	Residential (High Density)	1.1	6,600	Alley 10" SS and 6" SS; Kains Ave. 6" SS
C Zoning Gen. Commercial	0.6	528	Residential (High Density)	0.6	3,600	Camino Plaza 6" SS; Linden Ave. 6" SS
C Zoning Gen. Commercial	0.6	528	Mixed Use Retail / Residential (High Density)	0.6	3,600	El Camino " SS; San Bruno Trunk size unknown; Camino Plaza 6" SS
C Zoning Gen. Commercial	0.6	528	Residential (High Density)	0.6	3,600	San Bruno Trunk size unknown; Camino Plaza 6" SS
A-R Zoning Admin. – Research	0.8	880	Residential (High Density)	0.8	4,800	San Bruno Trunk size unknown; Alley 6" SS
C-O, C, and A-R Zoning Community Office / Gen. Commercial / Admin. – Research	4.2	4,620	Mixed Use Retail / Residential (High Density)	4.2	25,200	San Bruno Trunk size unknown; Bay Hill DR 18" SS; El Camino " SS
<b>Total</b>	<b>11.2</b>	<b>10,956</b>	<b>Total</b>	<b>11.2</b>	<b>67,200</b>	



	Parcels Identified for Potential Development or Redevelopment
	Single-Family Residential (R-1)
	Low-Density Residential (R-2)
	Planned Development (P-D)
	General Commercial (C)
	Central Business District (C-B-D)
	Neighborhood Commercial (C-N)
	Community Office (C-O)
	Combined Commercial and Manufacturing (C-M)
	Administrative and Research (A-R)
	Civic Uses

### San Bruno Avenue Corridor

#### Impacts:

- Water will be increased 1.8 times the current demand.
- Sanitary Sewer will be increased 2.9 times the current demand.
- Stormwater increase will have a minor impact.

#### Recommendations:

**Water:** The newly constructed 12" water main loop will provide adequate capacity for future development along the San Bruno Avenue Corridor. This system should eventually "loop" the San Mateo (North and South) Corridors, the El Camino Real (South and North) Corridors, and the San Bruno Corridor.

**Sanitary Sewer:** It is anticipated that new construction will require a new 10" SS line, approximately 1,500 LF to replace the existing 6" SS line in San Bruno Avenue and connect to the new 18" SS trunk line in El Camino Real. It is estimated to cost \$400,000.

**Storm Drain:** The increase in demand is based on land use runoff coefficients; actual anticipated runoff could go down with mitigation measures and detention/retention requirements placed on the developers by the City.

**Table 8.16: Potential Development Parcels Stormwater Runoff Demands. San Bruno Avenue Corridor**

Existing Land Use	Existing Acreage	Existing Storm Demand (CFS)	Proposed Land Use	Acreage	Proposed Storm Demand (CFS)	Street Name and Ex. SD Line)
<b>C Zoning Gen. Commercial</b>	0.4	0.54	Residential Multi Family/High Density)	0.4	0.61	San Bruno Ave. 15" SD
<b>C Zoning</b>	1.3	1.76	Mixed Use Retail / Residential (High Density)	1.3	2.11	Linden Ave. 10" SD; El Camino 10" SD, 6x4 Culvert
<b>Gen. Commercial</b>	0.4	0.54	Residential Multi Family/High Density)	0.4	0.61	San Bruno Ave. 15" SD
<b>R-1 and C Zoning Single Family Residential / Gen. Commercial</b>	0.7	0.94	Residential High Density)	0.7	1.07	San Bruno Ave. 15" SD
<b>C Zoning Gen. Commercial</b>	0.6	0.81	Mixed Use Retail / Residential Multi Family/High Density)	0.6	0.97	San Bruno Ave. 15" SD; Huntington Trunk size unknown
<b>C Zoning Gen. Commercial</b>	1.0	1.35	Mixed Use Retail / Residential (Multi Family/High Density)	1.0	1.62	San Bruno Ave. 15" SD; Huntington Trunk size unknown
<b>Total</b>	3.1	4.18	Total	3.1	4.88	

**Table 8.17: Potential Development Parcels Water Demands. San Bruno Avenue Corridor**

Existing Land Use	Existing Acreage	Existing Water Demand (GPD)	Proposed Land Use	Acreage	Proposed Water Demand (GPD)	Street Name and Ex. Water Line
C Zoning Gen. Commercial	0.4	480	Residential Multi Family/High Density)	0.4	1,240	San Bruno Ave. 6" W and 2" W; Green Ave. 2" W, 4" W, and 6" W
C Zoning	1.3	1.76	Mixed Use Retail / Residential (High Density)	1.3	2.11	Linden Ave. 10" SD; El Camino 10" SD, 6x4 Culvert
Gen. Commercial	0.4	480	Residential Multi Family/High Density)	0.4	1,240	San Bruno Ave. 6" W and 2" W; Green Ave. 2" W, and 6" W; Easton Ave. 2" W, 6" W, and 8" W
R-1 and C Zoning Single Family Residential / Gen. Commercial	0.7	840	Residential High Density)	0.7	2,870	San Bruno Ave. 6" W and 2" W; Easton Ave. 2" W, 6" W, and 8" W; Mason Ave. 2" W, 4" W, and 6" W
C Zoning Gen. Commercial	0.6	720	Mixed Use Retail / Residential Multi Family/High Density)	0.6	1,860	San Bruno Ave. 6" W and 2" W; Mills Ave. 2" W, 4" W, and 6" W; Huntington Ave 6" W
C Zoning Gen. Commercial	1.0	1,200	Mixed Use Retail / Residential (Multi Family/High Density)	1.0	3,100	San Bruno Ave. 6" W and 2" W; Mills Ave. 2" W, and 6" W; Huntington Ave 2" W
<b>Total</b>	<b>3.1</b>	<b>3,720</b>	<b>Total</b>	<b>3.1</b>	<b>10,310</b>	

**Table 8.18: Potential Development Parcels Sanitary Sewer Demands. San Bruno Avenue Corridor**

Existing Land Use	Existing Acreage	Existing Sewer Demand (GPD)	Proposed Land Use	Acreage	Proposed Sewer Demand (GPD)	Street Name and Ex. Sewer Line
<b>C Zoning Gen. Commercial</b>	0.4	352	Residential Multi Family/High Density)	0.4	1,200	San Bruno Ave. 6" SS
<b>C Zoning</b>	1.3	1,76	Mixed Use Retail / Residential (High Density)	1.3	2.11	Linden Ave. 10" SD; El Camino 10" SD, 6x4 Culvert
<b>Gen. Commercial</b>	0.4	352	Residential Multi Family/High Density)	0.4	1,200	San Bruno Ave. 6" SS
<b>R-1 and C Zoning Single Family Residential / Gen. Commercial</b>	0.7	798	Residential High Density)	0.7	4,200	San Bruno Ave. 6" SS
<b>C Zoning Gen. Commercial</b>	0.6	528	Mixed Use Retail / Residential Multi Family/High Density)	0.6	1,800	San Bruno Ave. 6" SS; Huntington Ave. 8" SS
<b>C Zoning Gen. Commercial</b>	1.0	880	Mixed Use Retail / Residential (Multi Family/High Density)	1.0	3,000	San Bruno Ave. 6" SS; Huntington Ave 8" SS
<b>Total</b>	3.1	2,910	Total	3.1	11,400	

### 8.3 POTENTIAL ADDITIONAL INFRASTRUCTURE UPGRADES

The adequacy and reliability of the City's water, sanitary sewer and stormwater systems is vital for the commercial and residential redevelopment of property in the transit corridors area. Management staff of the City's Water, Wastewater and Stormwater Divisions reviewed the infrastructure assessment in the previous section, and based on the aging and deteriorated conditions of much of the underground infrastructure in the project area, additional improvements were identified in order to rehabilitate existing underground infrastructure systems to meet current City standards. The master plans for all three systems are scheduled to be updated within the next one to two years. The master plans will identify necessary infrastructure improvements and establish the priorities that will provide more reliable and efficient service throughout the City. This section provides a planning level cost estimates for infrastructure improvements. The assumptions include cost of materials, manholes, traffic control, and 15% contingency.

## Wastewater

The City’s Capital Improvement Program plans for complete rehabilitation of the entire sewer collection pipeline system within the next 25 years. Deficiencies include broken or seriously leaking pipes, manholes that are structurally or hydraulically inadequate, pipeline conditions that restrict flow, or chronic maintenance locations that can only be remedied by repairs. Many of these problems are caused by the age of the underground infrastructure, which averages 60 to 80 years old. In the Transit Corridors Area many pipes are 90 to 100 years old and are made of clay, and most are undersized. About 90% of the sewage from the Transit Corridors Area drains to an 18” sewer main along Angus Avenue East. Wastewater management staff reported that the entire system within the transit corridors area needs to be replaced and upsized.

The previous section of this chapter identified approximately 9,000 linear feet of wastewater mains that need to be upgraded to accommodate the additional demands on the system assuming the maximum development allowed under the Transit Corridors Plan. Wastewater management staff identified a need to replace an additional approximately 8,500 feet of old or deteriorated mains and 5,800 feet of laterals and cleanouts. The estimated cost is \$5.2 million.

**Table 8.19: Sewer Location**

Sewer Main Location	From	To	Length (Linear Feet)
El Camino Real	Crystal Springs Rd	Forest Ln	1,800
San Mateo Ave	El Camino Real	Huntington Ave	1,450
Angus Ave E	1st Ave	7th Ave	1,250
7th Ave	East Angus Ave	I-380	2,500
San Bruno Ave E	San Mateo Ave	7th Ave	1,500
Laterals			5,800
<b>TOTAL</b>			<b>14,300</b>

### Water

Much of the water supply and distribution system within the Transit Corridors Area has passed its useful life, and has been patched and re-patched numerous times over the years. Water main breaks that disrupt service are generally caused by the natural deterioration of the aging pipelines, which will ultimately lead to their failure. Upgrading and replacement of aging, damaged or undersized water mains is necessary to add additional pressure, volume and flow for taller buildings envisioned in the Plan and for fire protection.

The previous section of this chapter identified approximately 7,000 feet of water mains that need to be upgraded to handle the increased demand on the system assuming the maximum development allowed under the Transit Corridors Plan. Water management staff identified a need to replace an additional approximately 19,200 linear feet of old or deteriorated water mains and 130 fire hydrants within the transit corridors area, including installing a new 12-inch line along El Camino Real, so that two 12-inch mains are available on both sides of the street. The estimated cost is \$7.9 million.

**Table 8.20: Water Location**

Water Main Location	From	To	Length (Linear Feet)
San Bruno Ave W	Acacia Ave	Huntington Ave	900
San Mateo Ave N	San Bruno Ave	Scott St	1,400
El Camino Real (E side)	San Felipe Ave	Commodore Dr	2,800
El Camino Real (W side)	San Felipe Ave	Commodore Dr	3,600
San Bruno Ave E	Huntington Ave	7th Ave	1,850
Huntington Ave	Angus Ave	Forest Ln	3,200
Sylvan Ave	El Camino Real	Huntington Ave	1,300
Jenevein Ave	El Camino Real	San Mateo Ave	1,000
Montgomery Ave	Walnut Ave	Scott St	2,000
Taylor Ave	El Camino Real	Mastick Ave	350
Camino Plaza	Linden Ave	San Bruno Ave	800
<b>TOTAL</b>			<b>19,200</b>

Fire Hydrant Location	Hydrant Count
Fire Hydrants throughout the transit corridors area	130

## Stormwater

The previous section of this chapter determined that no storm drain improvements are necessary to handle the maximum development allowed under the Transit Corridors Plan. This is due to the fact that the area is currently built out and impervious surfaces will not increase, and plan will adopt standards that require development to reduce runoff. In addition, storm drain improvements will be constructed in conjunction with the Caltrain grade separation project, which will improve capacity in the flow of stormwater immediately upstream of the Caltrain right-of-way crossings, and alleviate much of the potential for flooding west of the tracks and in the downtown area along San Mateo Avenue.

Stormwater management staff assessed the condition of the existing drainage pipes and culverts in the transit corridors area, and found that the majority are in good to excellent condition. Approximately 700 feet of corrugated metal pipe in El Camino Real and San Mateo Avenue were identified as being in poor condition and in need of replacement with concrete pipes. The estimated cost is \$175,000.

**Table 8.19: Stormwater Location**

Stormwater Pipe Location	Length (Linear Feet)
El Camino Real (South)	200
San Mateo Ave (North)	500
<b>TOTAL</b>	<b>700</b>

