Attachment 1

EXHIBIT C

Revised Draft Technical Report

Millbrae Station Area Specific Plan Development Impact Fee Study

The Economics of Land Use

Prepared for:

City of Millbrae

Prepared by:

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February 3, 2017

EPS #161025

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1. Introduction and Summary of Findings

This Development Impact Fee Technical Report (Technical Report) provides the City of Millbrae (the City) with the necessary technical documentation to support the adoption of a new Millbrae Station Area Specific Plan (MSASP) Development Impact Fee Program (Area Fee Program). This Area Fee Program will generate funding for capital facilities/improvements associated with the transportation, wastewater, public safety, and parks/recreation functions.[1] Development impact fees are one-time charges on new development collected and used by the City to cover the cost of capital facilities, vehicles, and equipment that are required to serve new growth; in this case, new development in the MSASP. Fees are typically collected upon issuance of a building permit, though in some cases on issuance of a certificate of occupancy or final inspection. This Technical Report has been prepared by Economic & Planning Systems, Inc. (EPS), with direction and input from City staff and other City consultants. The Technical Report is based on the series of prior technical studies (MSASP Feasibility Study) prepared for the City, overseen by West Yost Associates, and accepted by City Council in March 2016.[2]

The MSASP Fee Program described in this Technical Report is based on the required investment in capital improvements/facilities identified by City staff and their consultants. These improvements were identified as necessary to serve new growth identified under the MSASP. In some cases, specific capital facility investments have been identified; these individual projects may be altered or replaced over time (with other qualifying projects) as the City administers the Area Fee Program and funds capital equipment and facilities needed to serve new development. Development impact fee estimates are consistent with the most recent relevant case law and the principles of AB 1600 (the Mitigation Fee Act) and Government Code Section 66000 et seq. ("Fees for Development Projects;" except where specific citations are provided, this statute will be referred to as the Mitigation Fee Act.

This Technical Report provides the nexus findings, underlying analysis, and the associated calculations of the maximum supportable citywide fees that could be charged.

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[1] Water system improvements were also identified but only apply to one subarea of the MSASP. As a result, they are not included in the Area Fee Program.

[2] The City Council, at its March 22, 2016 meeting, by motion, accepted the MSASP Feasibility Study consisting of technical studies establishing baseline costs for infrastructure and City capital facilities. These technical studies, prepared in 2015, were conducted to support the development of the Area Fee Program and include studies on wastewater (West Yost Associates), transportation (W-Trans), parks and recreation (Callander & Associates), and public safety (Citygate Associates).

Report Background and Legal Context

In February 2016, the City Council approved an update to the 1998 Millbrae Station Area Specific Plan (MSASP), a 116 acre area adjacent to the Millbrae Bay Area Rapid Transit (BART) Station and Caltrain Station Area. The MSASP Plan Area envisions new residential, office, retail, and hotel development. The demolition/redevelopment of some existing industrial/non-retail uses is also envisioned as part of MSASP development. To implement the MSASP, the City intends to establish an Area Fee Program that will provide funding for the required MSASP infrastructure/ capital facilities consistent with the Mitigation Fee Act.

The Area Fee Program described in this Technical Report is designed to fund the appropriate portion of capital facility costs associated with the required transportation, wastewater, public safety, and parks facility investments. The capital facility needs associated with new development under the MSASP along with their costs and appropriate allocations are based on the MSASP Feasibility Study accepted by the City Council in March 2016.

This Technical Report is designed to provide the necessary technical analysis supporting a schedule of area development impact fees to be established by an Impact Fee Ordinance and Resolution. The Mitigation Fee Act allows the City to adopt, by resolution, the Capital Facilities Fee Schedule consistent with the supporting technical analysis and findings provided in this Report. The Resolution approach to setting the fee allows periodic adjustments of the fee amount that may be necessary over time without amending the enabling ordinance.

The key requirements that determine the structure, scope, and amount of the proposed Area Fee Program as required by State Law are as follows:

- **Collected for Capital Facilities/Improvements**. Area Development Impact Fee revenue can be collected and used to cover the cost of capital facilities and infrastructure required to serve new development and growth in the MSASP. However, area fee revenue cannot be used to cover the operation and maintenance costs of these or any other facilities and infrastructure.

- **Cannot Fund Existing Needs**. Impact fee revenue cannot be collected or used to cover deficiencies in existing City capital equipment and facilities. The portion of capital costs required to meet the needs of the City's existing service population must be funded through other sources. The costs associated with improvements that serve the needs of both new area development and existing development must be split on a "fair share" basis according to the proportion attributable to each. In these cases, area development impact fee funding will need to be augmented by other revenue sources to meet overall funding requirements.

- **Must Be Based on a Rational Nexus**. An (area) development impact fee must be based on a reasonable nexus, or connection, between new growth and development and the need for a new facility or improvement. As such, an impact fee must be supported by specific findings that explain or demonstrate this nexus. In addition, the impact fee amount must be structured such that the revenue generated does not exceed the cost of providing the facility or improvement for which the fee is imposed.

This Technical Report and the technical information it contains should be maintained and reviewed periodically by the City as necessary to ensure Area Fee accuracy and to enable the adequate programming of funding sources. To the extent that improvement requirements, costs, development potential, or other driving factors change over time, the Area Fee Program will need to be updated.

Proposed Fees

Table 1 shows the supported and proposed Area Development Impact Fee Schedule for the facility types evaluated based on the nexus findings and analysis contained in this Technical Report. These development impact fees apply to new residential and nonresidential development in the MSASP to fund a fair share portion of required capital facility investments.

The proposed fee estimates include a 2 percent fee program administration fee, consistent with other Mitigation Fee Act program administrative costs in many other California jurisdictions.[3] The Area Development Impact Fees proposed in this Technical Report only apply to new development within the MSASP geography.

The proposed fee schedule is consistent by land use throughout the MSASP for transportation, parks and recreation, and public safety facilities. For wastewater, there are minor differences between subareas referred to as Retail 1, Retail 2, Office 1, and Residential 4 and other subareas due to the need for additional investment in gravity main capacity improvements. **Table 2** shows the supported and proposed Area Development Impact Fee Schedule for these subareas. **Figure 1** provides an overview of the MSASP subareas, including the areas where the additional wastewater fees will apply.

Tables 1 and **2** show the proposed Area Development Impact Fees for the City to levy, as calculated in this analysis. Industrial/Non-Retail fees are identified so fee credits can be applied where applicable. The City could adopt fees at levels below this maximum, nexus-supported levels based on policy considerations though funding from other sources would be required to backfill the reduced fee revenues.

[3] The 2 percent administration cost is designed to cover expenses for preparation of the development impact fee technical report and subsequent updates as well as the required reporting, auditing, collection and other annual administrative costs involved in overseeing the program. Development impact fee programs throughout California have applied similar administrative charges.

Table 1 Summary of Maximum Capital Facility and Equipment Development Impact Fees

Land Uses (1)	Measure	Sewer (1)	Transportation (2)	Parks (3)	Public Safety (4)	Total
Residential (multifamily)	Per Unit	$2,210	$1,923	$21,516	$219.70	**$25,869**
Office	Per Sq.Ft.	$1.84	$3.65	$3.36	$0.17	**$9.01**
Retail	Per Sq.Ft.	$21.50	$20.73	$2.10	$0.10	**$44.44**
Hotel	Per Room	$3,672	$1,923	$672	$33.16	**$6,301**
Industrial/Non-Retail	Per Sq.Ft.	N/A	$3.67	$0.84	$0.04	**$4.55**

*Includes a 2 percent administrative fee to cover City costs of reporting, managing, and updating fee program.

(1) MSASP Sewer Fees are set to cover the full costs of required MSASP sewer improvements. Sewer fees are higher in selected MSASP development areas (Retail 1, Retail 2, Office 1, and Residential 4) due to additional costs associated with gravity main capacity improvements (not shown here).
(2) MSASP Transportation Fees set to cover net cost of transportation improvements after adjusting for assumption that 80 percent of Bay Trail costs will be covered by other City funding sources.
(3) MSASP Parks Fees are based on an existing service-standard adjusted for residential and nonresidential land uses and applied to all MSASP land uses.
(4) MSASP Public Safety Fees are set to cover the full costs of required MSASP public safety facilities.

Sources: City of Millbrae; West Yost Associates; W-Trans; Callander Associates; Citygate Associates; and Economic & Planning Systems, Inc.

Table 2 Summary of Maximum Capital Facility and Equipment Development Impact Fees: Applies Only in Retail 1, Retail 2, Office 1, and Residential 4 Areas

Land Uses (1)	Measure	Sewer (1)	Transportation (2)	Parks (3)	Public Safety (4)	Total
Residential (multifamily)	Per Unit	$2,316	$1,923	$21,516	$219.70	**$25,975**
Office	Per Sq.Ft.	$1.92	$3.65	$3.36	$0.17	**$9.10**
Retail	Per Sq.Ft.	$22.54	$20.73	$2.10	$0.10	**$45.47**
Hotel	Per Room	$3,672	$1,923	$672	$33.16	**$6,301**
Industrial/Non-Retail	Per Sq.Ft.	N/A	$3.67	$0.84	$0.04	**$4.55**

*Includes a 2 percent administrative fee to cover City costs of reporting, managing, and updating fee program.

(1) MSASP Sewer Fees are set to cover the full costs of required MSASP sewer improvements. Sewer fees are higher in selected MSASP development areas (Retail 1, Retail 2, Office 1, and Residential 4) due to additional costs associated with gravity main capacity improvements (shown here).
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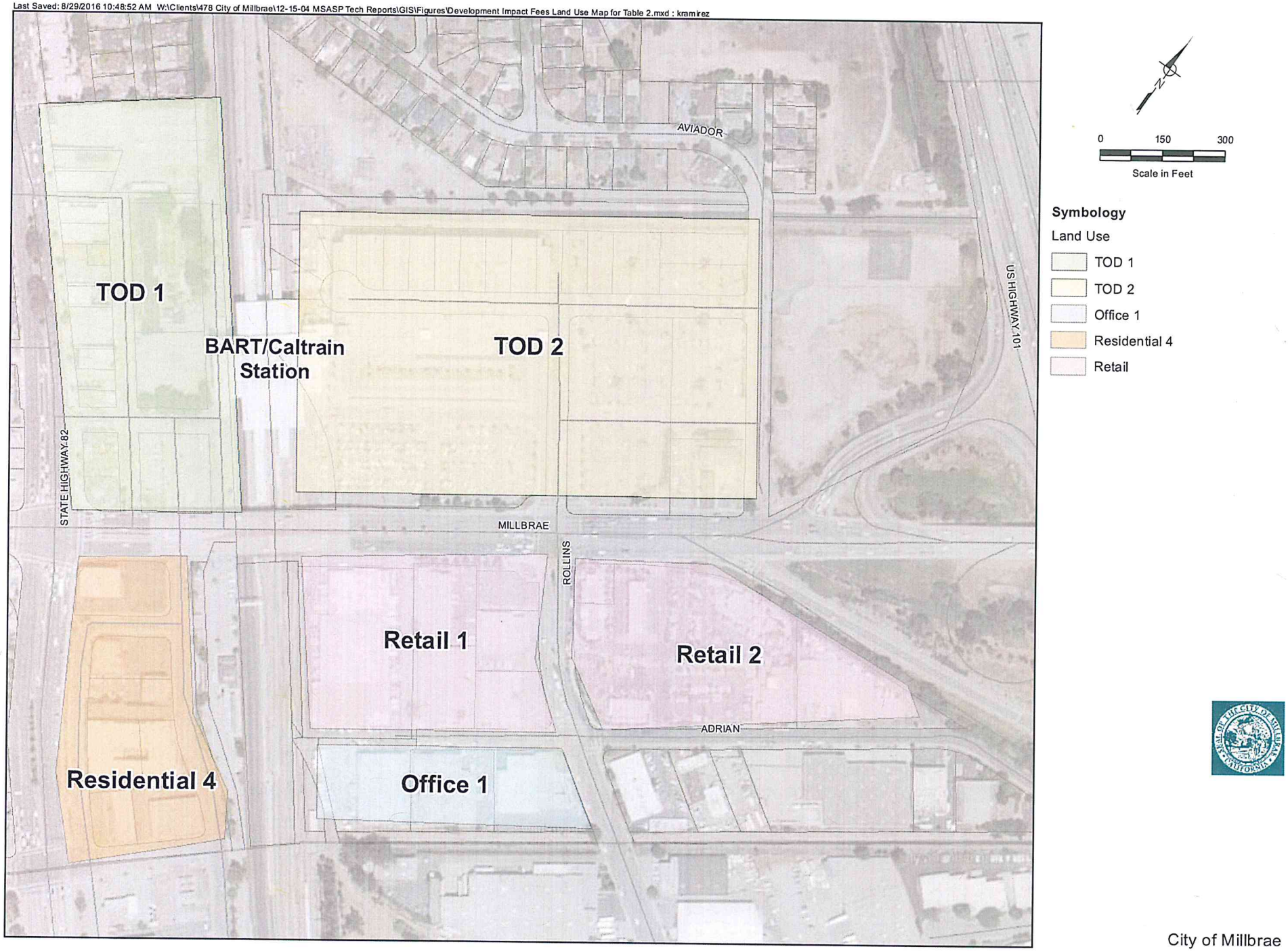
(3) MSASP Parks Fees are based on an existing service-standard adjusted for residential and nonresidential land uses and applied to all MSASP land uses.
(4) MSASP Public Safety Fees are set to cover the full costs of required MSASP public safety facilities.

Sources: City of Millbrae; West Yost Associates; W-Trans; Callander Associates; Citygate Associates; and Economic & Planning Systems, Inc.

Figure 1 Development Land Use Map



City of Millbrae

Key Assumptions and Sources

The results of this analysis are based on a variety of conditions and assumptions regarding the need for and cost of new and replacement capital facilities, vehicles, and capital equipment and development capacity/growth projections provided by the City's MSASP program and associated studies. Assumptions are covered in detail in later chapters, though some of the key factors are summarized below:

- **Capital Facilities Requirements**. The technical analyses overseen by West Yost & Associates for the City indicated the required wastewater, transportation, and public safety capital facilities associated with MSASP implementation. The technical analysis for parks and recreation proposed a service standard-based approach to determining parks and recreation needs which were refined as part of this Technical Report.

- **Cost Estimates**. Capital facility cost estimates/unit cost estimates were provided by the technical analyses of West Yost Associates (wastewater), W-Trans (transportation), Callander & Associates (parks and recreation), and Citygate Associates (public safety services).

- **Cost Allocation to New Development**. The technical analyses determined that the new capital facilities were required to serve new MSASP development and so the full costs of new capital facilities were allocated to new development (and the Area Fee Program), with the exception of the Bay Trail. For the Bay Trail, grant and other funding are also assumed.

- **Cost Allocation between Land Uses**. The allocation of capital facilities costs between land uses depends on the relative demand generated by each land use category. Due to the different nature of the demand for each facility type, a different allocation approach was required for each. Consistent with the prior technical analyses, transportation costs were allocated based on pm peak hour person trip rates, wastewater based on average daily wastewater flow rates, public safety based on a service population (where two employees were equivalent to one resident), and parks and recreation based on a service population (where five employees were equivalent to one resident)

- **Growth and Development**. New MSASP development was provided in the MSASP EIR with new development (and demolition) identified for residential, office, retail, hotel, and industrial/non-retail uses. These development estimates were used in the technical analyses that identified the capital facilities needs as well as in the estimation of the Area Development Impact Fees. For the parks and recreation fees, where a service standard based approach was used, the existing population and job estimates for the City of Millbrae were drawn from California Department of Finance demographics data and U.S. Census Bureau jobs data. Future population estimates incorporated American Community Survey (ACS) data for persons per household.

Fee Program Implementation and Administration

Annual Reporting

State Law (at Govt. Code. §§ 66001(c), 66006(b)(1)) stipulates that each local agency that requires payment of a fee make specific information available to the public annually within 180 days of the last day of the fiscal year. This information includes the following:

- A description of the type of fee in the account
- The amount of the fee
- The beginning and ending balance of the fund
- The amount of fees collected and interest earned
- Identification of the improvements constructed
- The total cost of the improvements constructed
- The fees expended to construct the improvement
- The percentage of total costs funded by the fee

If sufficient fees have been collected to fund specific improvements, the agency must specify the approximate date for the development of that improvement. Because of the dynamic nature of growth and capital equipment requirements, the City should monitor inventory activity, the need for infrastructure improvements, and the adequacy of the fee revenues and other available funding. Formal annual review of the Fee Program should occur, at which time adjustments should be made. Costs associated with this monitoring and updating effort are included in the Area Development Impact Fee and are assumed to be 2 percent of overall Fee Program capital costs.

Credits, Reimbursement, and Exemptions

Under certain and limited circumstances, as determined by the City, the Area Development Impact Fee Ordinance could allow developers subject to the fee to obtain credits, reimbursements, or exemptions. In cases of redevelopment, the City could consider providing a fee credit/discount associated with the amount of fee that the demolished development would pay under the new fee schedule. This is consistent with the methodologies and fee estimates for the transportation, parks and recreation, and public safety fees. All other fee credits, reimbursements, and/or exemptions should not be allowed by right but rather should be subject to review by City staff and the City Council to ensure that such credits or reimbursements are warranted and appropriate. Exemptions where the City elects not to impose fees for certain categories of development are an option, though alternative funding sources to offset a loss in fee revenue would need to be provided.

Surplus Funds

State Law also requires that if any portion of a fee remains unexpended or uncommitted in an account for five years or more after deposit of the fee, the City Council shall make findings once each year: (1) to identify the purpose to which the fee is to be put, (2) to demonstrate a reasonable relationship between the fee and the purpose for which it was charged, (3) to identify all sources and amounts of funding anticipated to complete financing of incomplete improvements, and (4) to designate the approximate dates on which the funding identified in (3) is expected to be deposited into the appropriate fund (§66001(d)).

If adequate funding has been collected for planned improvements, an approximate date must be specified as to when the cost of the improvement will be incurred. If the findings show no need for the unspent funds, or if the conditions discussed above are not met, and the administrative costs of the refund do not exceed the refund itself, the local agency that has collected the funds must refund them (Govt. Code §66001(e)(f)).

Periodic Updates

It is recommended that the Development Impact Fee Ordinance allow for an automatic annual adjustment to the fees based on the Consumer Price Index (CPI), Construction Cost Index (CCI), or a similar inflation factor. Over time, development forecasts, capital facility needs, and costs will change and evolve, making periodic technical updates prudent. This fee program is based on the estimated MSASP development program as well as the associated capital facility needs, including, for most facilities types, a listing of development impact fee eligible projects. These individual projects may be altered or replaced over time (with other qualifying projects) as the City administers the Development Impact Fee Program and funds capital equipment and facilities needed to serve new development.

Report Organization

Following on from this initial summary chapter, **Chapter 2** describes the MSASP development program and associated growth estimates used in this analysis. The subsequent chapters then provide the nexus findings, capital cost estimates, cost allocations, and technical fee calculations for each of the capital facilities categories as follows: **Chapter 3:** Transportation; **Chapter 4:** Wastewater; **Chapter 5:** Public Safety; and, **Chapter 6:** Parks and Recreation.

2. DEVELOPMENT PROGRAM AND GROWTH

The MSASP development program, as quantified in the MSASP Environmental Impact Report (DEIR), is shown in **Table 3**. The MSASP Area includes three distinct development areas, including two transit-oriented development areas (TOD #1 and TOD #2) and an additional area encompassing the remainder of the MSASP. All three of these areas envision a mix of uses, including different blends of residential, retail, office, and hotel uses. Industrial/non-retail redevelopment is also envisioned in two of the three areas.

As indicated in the MSASP DEIR Table 2-1 and shown in **Table 3**, the MSASP development program allows for the new development of about 1,400 multi-family residential units, 1.58 million square feet of office space, 142,500 square feet of retail space, and 325 hotel rooms. It also assumes the demolition of about 335,000 square feet of industrial/non-retail space.

Table 3 MSASP Development Program and Population/Job Estimates

Item	Development Program (1)	Pop./ Emp. Density (2)	Projected Resident/ Employee
New Residents	1,440 Units	2.65 person per unit	**3,816**
New Employees			
Office	1,577,325 Sq.Ft.	250 sq. ft. per job	6,309
Retail	142,535 Sq.Ft.	400 sq. ft. per job	356
Hotel	325 Rooms	1.25 rooms per job	260
Industrial/Non-Retail	(335,240) Sq.Ft.	1,000 sq. ft. per job	-335
Net New Employees			**6,590**

(1) Development program based on proposed project buildout projections summary in the MSASP DEIR, Table 2-1.
(2) Population/ employment density assumptions based on proposed project buildout projections summary in the MSASP DEIR, Table 2-1.

Source: City of Millbrae; MSASP DEIR; US Census Bureau; Economic & Planning Systems, Inc.

The MSASP DEIR also provided estimates concerning the population and jobs/employment associated with the MSASP development program. As shown in **Table 3**, population/employment densities were indicated for all land use categories, including 2.65 persons per household, a range of from 250 to 1,000 square feet per employee for office, retail, and industrial uses, and an estimate of 1.25 new rooms per job (or alternatively 0.8 jobs per hotel room).

The development program and these density factors result in overall estimates of the potential population and employment associated with the MSASP. As shown in **Table 3**, this includes about 3,800 new residents and about net new 6,600 jobs. The City of Millbrae currently has approximately 23,100 residents and 4,500 jobs based on data from the California Department of Finance and U.S. Census Bureau.[4]

[4] The current Citywide numbers are provided for context and are also relevant to the parks and recreation fee estimates where the existing citywide service standard is relevant.

3. TRANSPORTATION

The following four chapters describe the necessary "nexus" between new development in the MSASP and the proposed capital facilities for each facility type (transportation, wastewater, public safety, and parks and recreation), as required under Government Code Section 66000 (also referred to as AB1600/the Mitigation Fee Act). Nexus findings address: 1) the ***purpose*** of the fee, 2) the specific ***use*** of fee revenue, 3) the ***relationship*** between the facility and the type of development, 4) the relationship between the ***need*** for the facility and the type of development, and 5) the relationship between the amount of the fee and the ***proportionality*** of cost specifically attributable to new development. The supporting technical calculations, assumptions, and fee estimates are also provided for each facility type.

The MSASP Area Transportation Development Impact Fee will cover new development's appropriate share of the costs of the new transportation facilities. This chapter provides the necessary nexus findings followed by the detailed technical calculations and fee schedule.

Nexus Findings

Purpose

The MSASP transportation fee will help maintain acceptable transportation operation in the Specific Plan Area, including for users of alternative modes.

Use of Fee

In combination with grant and other funding, fee revenue will be used to fund the required new transportation facility improvements including roadway and alternative mode facility improvements.

Relationship

New development in the MSASP will directly generate new demand for transportation facilities. Fee revenue will be used to fund a portion of these improvements.

Need

MSASP development will increase the travel (trips) by automobile and other modes of transportation, and thus, generate a need for the identified improvements.

Proportionality

With the exception of the Bay Trail improvements that will be primarily funded by grants and other sources, the new improvements are all required directly to support new MSASP development so the full cost of these improvements are allocated to new MSASP development. Costs are allocated proportionately between land uses based on the p.m. peak hour person trip rates generated respectively by each land use category.

Technical Calculations and Fee Estimates

This section describes the technical calculations and assumptions applied to determine the appropriate and supportable area development impact fees for transportation capital facilities. The key assumptions were provided by the technical analysis of MSASP transportation developed by W-Trans in 2015 along with later refinements and guidance from W-Trans and input from City staff.

Transportation Improvement List and Cost Estimates

The MSASP Feasibility Study identified the need for a series of transportation-related improvements to support MSASP development allowed under the EIR and as shown in **Table 4**. It also estimated the hard and soft costs associated with these improvements for a total MSASP transportation improvement cost of $23.7 million.

Cost Allocation to Area Development Fee Program

W-Trans also estimated that the City would be able to obtain about $13.0 million in grant and other funding to cover 80 percent of the total (hard and soft) cost of the Bay Trail to Aviador Avenue. A portion of this additional funding could come from parks and recreation fees on new development outside of the MSASP if the City adopts a Citywide parks and recreation fee. This funding reduces the total transportation costs allocated to new MSASP development to $10.7 million (see **Table 4**). W-Trans indicated that all the other transportation improvements are required due to the proposed MSASP development and so these costs are all allocated to new development under the MSASP Area Fee Program.

Cost Allocation by Land Use and Fee Calculation

Trip generation rates are a typical method of measuring demand for new transportation improvements and allocating costs proportionately between new land uses. As part of the DEIR transportation analysis, Fehr & Peers estimated the total p.m. peak hour trip generation associated with new MSASP development at 2,697 trips. The MSASP Feasibility Study used this trip estimate in conjunction with the area fee cost allocation to develop a per p.m. peak hour person trip cost of $3,952 (see **Table 4**).

The Fehr & Peers DEIR transportation analysis also indicated p.m. peak hour person trip estimates associated with the development under the different land use categories showing the trip generation rates by land use category (see **Table 5**). These trip generation rates were combined with the estimated cost per trip to develop the Area Development Impact Fee Schedule for transportation improvements (see **Table 6**). The fee schedule assumes industrial/non-retail development will be credited if redevelopment of existing uses occurs.

Table 4 Transportation Development Impact Fee: Area Fee Program Transportation Costs

Improvement		Total Cost (1)	Non-Fee Funding (2)	Net Cost
MSASP Transportation Improvement Costs				
Hard Costs				
El Camino Real/Millbrae Ave		$79,300	$0	$79,300
El Camino Real/Murchison Ave		$915,000	$0	$915,000
California Dr/Murchison Ave		$241,200	$0	$241,200
Rollins Rd/Millbrae Ave		$55,400	$0	$55,400
California Dr Extension		$3,864,000	$0	$3,864,000
Bike Route Designation		$16,800	$0	$16,800
Multimodal Multi-Agency Comprehensive Station Access Plan		$350,000	$0	$350,000
Bay Trail to Aviador Ave		$12,165,200	$9,732,160	$2,433,040
Subtotal		**$17,686,900**	**$9,732,160**	**$7,954,740**
Implementation/ Soft Costs				
Environmental Approval	2%	$353,738	$194,643	$159,095
Design	12%	$2,122,428	$1,167,859	$954,569
Construction Management	10%	$1,768,690	$973,216	$795,474
Overhead and Administration	10%	$1,768,690	$973,216	$795,474
Subtotal		**$6,013,546**	**$3,308,934**	**$2,704,612**
Grand Total		**$23,700,446**	**$13,041,094**	**$10,659,352**

Net MSASP Transportation Costs per PM Peak Trip	
Net MSASP Transportation Costs	$10,659,352
PM Peak Hour Person Trips (3)	2,697
Cost per PM Peak Hour Person Trip	**$3,952**

(1) From MSASP Feasibility Study, November 2015.
(2) Other funding assumes 80 percent of Bay Trail costs are funded by grants and other sources.
(3) See W-Trans Millbrae Specific Plan Transportation Impact Fee Program, November 2015.

Sources: W-Trans; City of Millbrae; EPS

Table 5 PM Peak Hour Person Trip Generation Rates

Land Uses	MSASP Development		Total PM Peak Hour Person Trips	PM Peak Hour Person Trip Rate
Residential (multi family)	1,440	Units	687	0.48 per Unit
Office	1,577,235	Sq.Ft.	1,427	0.90 per 1,000 Sq.Ft.
Retail	142,535	Sq.Ft.	733	5.14 per 1,000 Sq.Ft.
Industrial/Non-Retail	(335,240)	Sq.Ft.	(305)	0.91 per 1,000 Sq.Ft.
Hotel	325	Rooms	155	0.48 per Room
Total	**N/A**		**2,697**	**N/A**

* Assumes same trip rates are applicable throughout the MSASP area.

Sources: Transportation Technical Report; W-Trans; City of Millbrae; and Economic & Planning Systems, Inc.

Table 6 Transportation Fee Estimates

Land Use	PM Peak Hour Person Trip Rate *(a)*	Fee Estimate *c = (a) x (b)*	Administrative Fee (2%) *d = (c) * (1.02)*
Cost per PM Peak Hour Person Trip *(b)*		**$3,952**	
Residential (multifamily)	0.48 per unit	$1,886 per unit	$1,923 per unit
Office	0.90 per 1,000 sq. ft.	$3.58 per 1,000 sq. ft.	$3.65 per 1,000 sq. ft.
Retail	5.14 per 1,000 sq. ft.	$20.33 per 1,000 sq. ft.	$20.73 per 1,000 sq. ft.
Industrial/ Non-Retail (1)	0.91 per 1,000 sq. ft.	$3.60 per 1,000 sq. ft.	$3.67 per 1,000 sq. ft.
Hotel	0.48 per room	$1,886 per room	$1,923 per room

(1) Assumes all demolished industrial development is given a fee credit.

4. WASTEWATER

The MSASP Area Wastewater Development Impact Fee will cover new development's appropriate share of the costs of the new wastewater facilities. This chapter provides the necessary nexus findings followed by the detailed technical calculations and fee schedule.

Nexus Findings

Purpose

New development in the MSASP service area will increase the demand for wastewater services and will result in the need for additional wastewater capacity facilities.

Use of Fee

The area development wastewater fees will fund Rainfall Infiltration Inflow (RDII) and gravity main improvements needed to provide adequate sewage treatment services to the MSASP. The RDII improvements are required to serve the whole MSASP area, while an additional fee will only apply in the specific subareas of the MSASP which the gravity main improvements will serve.

Relationship

New residential and nonresidential development in the MSASP will create additional wastewater flow to the existing wastewater plant. Area Development Impact Fee revenue will fund the additional wastewater improvements required above-and beyond those funded by the City's sewer connection fees

Need

Wastewater infrastructure upgrades are necessary to ensure adequate wastewater treatment facilities to serve the MSASP service area as development occurs and the number of users increase.

Proportionality

The identified wastewater improvements are required to serve new development and so the full cost of these improvements is included in the Area Development Impact Fee. The costs of wastewater improvements are allocated between land uses based on the estimated waste water generation rates of each land use as measured by Average Daily Water Flow (ADWF).

Technical Calculations and Fee Estimates

This section describes the technical calculations and assumptions applied to determine the appropriate and supportable area development impact fees for wastewater capital facilities. The key assumptions were provided by the technical analysis of MSASP wastewater developed by West Yost & Associates.

Wastewater Improvements, Cost Estimates, and Cost Allocations

Table 7 shows the costs associated with the two required improvements, including $10.1 million for the Rainfall Infiltration Inflow (RDII) improvements and $133,000 for the gravity main improvements. As shown, the RDII serves all MSASP subareas/land uses, while the gravity main

improvement is only associated with selected subareas. The full costs these improvements are allocated to new development as they would not be required without MSASP development.

The MSASP Feasibility Study shows the costs evenly distributed by subarea based on ADWF. As also shown, based on the ADWF estimates (measured in Gallons per Day (GPD)), the average cost per ADWF for the RDII is $18 per ADWF (GPD) and $0.87 per ADWF (GPD) for the gravity main (where applicable) (see **Table 7**).

Table 7 Capital Costs and Cost Allocations for Sanitary Sewer Collection and Treatment Capacity

Development Area	ADWF (GPD) (1)	RDII Total Costs (2)	Gravity Main Improvements (3)
TOD 1	121,153	$2,181,000	
TOD 2	133,254	$2,399,000	
Subtotal	**254,407**	**$4,580,000**	
Hotel 1	13,933	$251,000	
Hotel 2	13,933	$251,000	
Hotel 3	13,933	$251,000	
Subtotal	**41,799**	**$753,000**	
Residential 1	13,345	$240,000	
Residential 2	9,638	$173,000	
Residential 3	14,828	$267,000	
Residential 4	36,328	$654,000	$32,000
Subtotal	**74,139**	**$1,334,000**	
Retail 1	37,242	$670,000	$32,000
Retail 2	37,242	$670,000	$32,000
Subtotal	**74,484**	**$1,340,000**	
Office 1	42,391	$763,000	$37,000
Office 2	72,179	$1,299,000	
Subtotal	**114,570**	**$2,062,000**	
Total	**559,399**	**$10,069,000**	**$133,000**
Average Cost	**$18.00 / ADWF (GPD)**		**$0.87 / ADWF (GPD)**

(1) ADWF (GPD) = Average Daily Water Flow/ Gallons per Day.
(2) Applies to all new MSASP development. Average cost = $10.07 million / 559,300 GPD.
(3) Only applies to following areas: Residential 4, Retail 1, Retail 2, and Office 1. Average cost = $133,000 / 153,203 GPD.

Source: Capacity Technical Report, West Yost & Associates, December 2015 (Table ES-3)

Technical Fee Calculation

The MSASP Feasibility Study and the City of Millbrae Water Supply Assessment provided wastewater generation rates (ADWF/GPD) for the proposed new land uses in the MSASP as shown in **Table 8**. Applying these generation rates to the improvement costs per ADWF/GPD above provides the Area Development Impact Fees for wastewater improvements. **Table 8** shows the wastewater fee that applies to all new development in the MSASP. **Table 9** shows the fees that apply to new development in the Residential 4, Retail 1 and 2, and Office 1 subareas (see earlier **Figure 1** for map). This fee level is slightly higher as it includes the contribution for the gravity main improvements.

Table 8 Wastewater Fee Schedule: Residential and Nonresidential Development

Land Use	Wastewater Generation Rate (1) *a*	RDII Reduction Fee (2) *c = (a) x (b)*	Administrative Fee (2%) *d = (c) * (1.02)*
Average Cost *(b)*		**$18.00 / ADWF (GPD)**	
Office	0.1 gpd/SF	$1.80 per Sq.Ft.	$1.84 per Sq.Ft.
Industrial/Non-Retail	0.1 gpd/SF	$1.80 per Sq.Ft.	$1.84 per Sq.Ft.
Retail	1.17 gpd/SF	$21.08 per Sq.Ft.	$21.50 per Sq.Ft.
Residential	120.36 gpd/Unit	$2,166 per Unit	$2,210 per Unit
Hotel Rooms	200 gpd/Room	$3,600 per Room	$3,672 per Room

(1) See City of Millbrae Water Supply Assessment, GHD, June 2015 for wastewater generation rates as well West Yost Associates Sanitary Sewer Technical Report, Table 1.
(2) Applies estimated cost distribution of $18.00/ADWF to wastewater generation rates.
(3) Retail represents weighted average for retail store and retail restaurant categories.

Sources: Sanitary Sewer Technical report, West Yost Associates; City of Millbrae; GHD; Economic & Planning Systems, Inc.

Table 9 Wastewater Fee Schedule: Applies only to Residential 4, Retail 1, Retail 2, and Office 1 Areas

Land Use	RDII Reduction Fee (1) *a*	Gravity Main Capacity Improvement Fee (2) *b*	Total Fee (3) *c = a + b*	Administrative Fee (2%) *d = (c) * (1.02)*
Office	$1.80 per Sq.Ft.	$0.09 per Sq.Ft.	$1.89 per Sq.Ft.	$1.92 per Sq.Ft.
Industrial/ Non-Retail	$1.80 per Sq.Ft.	N/A	$1.80 per Sq.Ft.	$1.84 per Sq.Ft.
Retail (4)	$21.08 per Sq.Ft.	$1.02 per Sq.Ft.	$22.10 per Sq.Ft.	$22.54 per Sq.Ft.
Residential	$2,166 per Unit	$104 per Unit	$2,271 per Unit	$2,316 per Unit
Hotel Rooms	$3,600 per Room	N/A	$3,600 per Room	$3,672 per Room

(1) See Table 8.

(2) Applies estimated cost distribution of $0.87/ADWF to wastewater generation rates.

(3) Total includes gravity main capacity improvement fee; only applies to Residential 4, Retail 1, Retail 2, and Office 1.

(4) Retail represents weighted average for retail store and retail restaurant categories.

Sources: Sanitary Sewer Technical report, West Yost Associates; City of Millbrae; GHD; Economic & Planning Systems, Inc.

5. PUBLIC SAFETY

The MSASP Area Development Impact Fee for public safety facilities will cover new development's appropriate share of the costs of the new public safety facilities. This chapter provides the necessary nexus findings followed by the detailed technical calculations and fee schedule.

Nexus Findings

Purpose

The fee will help ensure there are sufficient fire facilities and equipment to serve new MSASP development.

Use of Fee

Fee revenues will be used to replace capital equipment as required, such as acquisition of new vehicles, and to provide upgrades to the Millbrae Fire Station #37.

Relationship

New development in the Plan Area will increase the use of public safety facilities, vehicles, and equipment. Fee revenues will be used to ensure that the City's public safety capital facilities and equipment can service new MSASP growth.

Need

MSASP development will result in substantial increases in the service population requiring fire service. This increase in fire service requires improvements to facilities as well as replacement of vehicles and equipment.

Proportionality

The identified public safety investments are required to ensure new development can be served without reducing the quality of service to the existing service population. As a result, the full cost of the improvements can be allocated to new development. Costs are allocated between land uses based on their relative service populations.

Technical Calculations and Fee Estimates

Capital Facility/Equipment Requirements and Cost Estimates

Table 10 shows the new public safety facilities/equipment required and their associated costs as identified by Citygate Associates. As shown, the total capital improvement cost was estimated at $578,000, the mid-point of the range provided by Citygate Associates. These improvements and the associated costs include.

- **Fire Station Upgrade.** The City of Millbrae plans to make improvements to its existing Fire Station #37 facility. Improvements include remodeling and upgrading the training tower and classroom to accommodate training props consistent with multi-story building construction. These improvements are estimated at $500,000.
- **Motorcycle and Equipment.** The cost of public safety vehicles and associated equipment replacement totals $53,000.

- **Community Service Officer Vehicle.** Community service officers use vehicles to accommodate its citywide services, and as new development takes place, it will contribute to replacement costs based on the additional use of these items. Replacement of one vehicle is approximately $25,000.

Table 10 Estimated Costs for Public Safety Improvements

Item	Cost Allocated to MSASP, Dollars
Capital Improvements	
Remodel/upgrade the Millbrae Fire Station #37 training tower and classroom to accommodate training props consistent with multi-story building construction	$500,000
Motorcycle and equipment	$53,000
Community Service Officer Vehicle	$25,000
Total Capital Improvements	**$578,000**

Source: Citygate Associates and Economic and Planning Systems, Inc.

Cost Allocations and Fee Calculation

Public Safety improvement costs were allocated between land uses using a per service population methodology. The per service population is a measure commonly used to incorporate job as well as resident growth into allocations of the public safety capital facilities demand and associated costs. Service population estimates for public safety improvements were derived based on a resident equivalent weighting of 1.0 for residents and 0.5 for employees (i.e. two employees generate the equivalent demand/use of public safety facilities/equipment as one resident). As shown in **Table 11**, new MSASP development is expected to generate a total service population of approximately 7,111 based on the population and employee density per land use category provided by the MSASP EIR (shown in **Table 2**).

As shown in **Table 12**, a proportionate distribution of the $578,000 among the full MSASP service population results in an average cost per service population/resident equivalent of about $81. This average cost per service population of $81 is then multiplied by the resident equivalent of each land use to derive the Area Development Impact Fee for public safety capital facilities by land use (see **Table 12**).

Table 11 Public Safety Service Population

Item	Projected Population (1)	Resident Equivalent Ratio	Service Population
New Residents	**3,816**	1.0	**3,816**
New Employees			
Office	6,309	0.5	3,155
Retail	356	0.5	178
Hotel	260	0.5	130
Industrial/Non-Retail	-335	0.5	-168
Net New Employees	**6,590**		**3,295**
Total	**10,406**		**7,111**

(1) Population/ employment density assumptions based on proposed project buildout projections summary in the MSASP DEIR, Table 2-1.

Source: City of Millbrae; MSASP DEIR; US Census Bureau; Economic & Planning Systems, Inc.

Table 12 Public Safety Fee Estimates by Land Use

Land Use	Pop./ Emp. Density *a*	Resident Equivalent Ratio *b*	Resident Equivalents *c = (a) x (b)*	Fee per Sq.Ft./ Unit/ Room *e = (c) x (d)*	Administrative Fee (2%) *f = (e) * (1.02)*
Average Cost per Service Population *(d)*				**$81.28**	
Multifamily	2.65 persons/unit	1.0	2.65 persons/unit	$215.39 per Unit	$219.70 per Unit
Office	4.0 persons/1,000 Sq.Ft.	0.5	2.0 persons/1,000 Sq.Ft.	$0.16 per Sq.Ft	$0.17 per Sq.Ft.
Industrial/Non-Retail	1.0 persons/1,000 Sq.Ft.	0.5	0.5 persons/1,000 Sq.Ft.	$0.04 per Sq.Ft	$0.04 per Sq.Ft.
Hotel	0.8 persons/room	0.5	0.4 persons/room	$32.51 per Room	$33.16 per Room
Retail	2.5 persons/1,000 Sq.Ft.	0.5	1.3 persons/1,000 Sq.Ft.	$0.10 per Sq.Ft	$0.10 per Sq.Ft.

Source: City of Millbrae; MSASP DEIR; and Economic & Planning Systems, Inc.

6. PARKS

The MSASP Area Development Impact Fee for parks and recreation is designed to ensure that the new MSASP development makes a proportionate contribution to City parks and recreation facilities based on a measure of the City's existing service standard. This chapter provides the necessary nexus findings followed by the detailed technical calculations and fee schedule.

Nexus Findings

Purpose

The fee will fund the provision of additional parks and recreation land and facilities sufficient to maintain the City's existing service standards.

Use of Fee

Fee revenues will contribute funding towards the acquisition of parkland as well as the improvement of parkland/recreational facilities.

Relationship

New MSASP development will result in new City resident and employment that will all increase the demand for City park and recreation facilities. More specifically, new City residents are assumed to use all City parkland and parks and recreation facilities, while new employees of the MSASP are assumed to use park facilities within half a mile of the new development and the improved Spur Trail.

Need

MSASP development program will increase the use of and demand for City parkland and parks and recreation facilities. Investments in additional parkland and facilities are required to maintain the existing service standard/to avoid a reduction in the service standard to existing residents.

Proportionality

The new parks/recreation facilities and costs allocated to new residential development as part of the Fee Program are based on the existing ratio between existing capital facilities (parkland and parks) and existing service population. New non-residential development fees are allocated based on nearby (within half a mile of the MSASP area) new parks/ recreation facilities and costs. As a result, the requirements placed on new development are directly proportional to the effective contributions of existing development. The associated parkland and facilities costs are allocated between land uses based on the modified service population associated with each land use.

Technical Calculations and Fee Estimates

Service Standards

There are currently 63.8 acres of developed parkland and school fields/facilities owned by or under long term lease to the City within the City limits. This includes the 44.8 acres of improved parkland indicated in the City's General Plan. However, the City no longer has a lease with SFO for the 3 acres of Bayfront property, thus the City's total inventory of improved parkland is

41.8 acres (see **Table 13**). In addition, the analysis accounts for school fields/facilities utilized outside of school hours. City Staff reviewed lease agreements with school districts and identified approximately 45.0 acres of school facilities available for public use, with about 32 acres inside the City limits (see **Tables 14** and **15**). Adjusting for the portion of operating hours when the public has access, results in the equivalent of 22.0 acres in developed parkland from school fields/ facilities.

The service standard for residential development in the City was then derived by dividing this developed park acreage by the City's existing service population, resulting in a service standard of 2.65 acres per 1,000 service population (see **Table 16**). In this case, a modified service population was developed for parkland and facilities based on other California parks and recreation fee programs (and associated surveys of park use). This service population standard includes a weighting of 1.0 for residents and 0.2 for employees (use of parks by five employees is the equivalent to one resident).[5] This same service standard was then applied to new residential uses in the MSASP.

The service standard for non-residential development was based on the same weighting factors, though a lower service standard was used. Non-residential service standards were based on the assumption that new MSASP employees will not utilize school fields/facilities and will most actively visit parks within a half-mile radius of the MSASP area and the improved Spur Trail. As shown in **Table 13**, 26.9 acres of City developed parkland is located within the half-mile boundary, representing a service standard of 1.12 acres per 1,000 service population (see **Table 16**).

[5] This is based on review of survey data or equivalencies used in the Cities of San Francisco, Santa Monica, Palo Alto, and Redwood City.

Table 13 Existing City Park and Recreation Facilities

Existing Park and Recreation Facilities	Acreage	
	Total	1/2 Mile Radius (1)
Scout House	0.10	0.00
Central Park	8.10	8.10
Josephine Waugh Park	5.00	5.00
Mills Estate Park	4.70	0.00
Shultz Park	2.50	0.00
Meadows Park	2.30	0.00
Green Hills Park	2.00	0.00
Marino Vista Park	1.20	0.00
Rotary Park	1.00	1.00
Bayside Manor Park	0.80	0.80
Bill Mitchell Park	0.80	0.00
Constitution Park	0.30	0.00
Spur Property (Improved)	12.00	12.00
Subtotal	40.80	26.90
Civic Center (Constitution Square)	1.00	0.00
Total	**41.80**	**26.90**

(1) Non-residential calculations include parkland within 1/2 mile radius of the MSASP area and the improved Spur Trail.

Source: City of Millbrae Parks, Open Space, and Conservation Element

Table 14 School District Lands and application to Citywide Parks Service Standard

School Playgrounds and Playfields	Acres	Contractual Agreement	Comments	Est. % of Public Use (1)	Total Acres
Mills High (2)	21.90	Yes	-	67%	14.8
Capuchino High (2)	12.80	Yes	Although Capuchino is in the SMUHSD and City has use agreement, it is excluded from City service standard due to location.	Excluded	0.0
Millbrae School District (3)	10.28	Yes	-	70%	7.2
Total	**44.98**				**22.0**

(1) Assumes 175 school days and 190 non-school days based on California Code of Regulations. Assumes that weekend and summer hours are 100 percent public use.
(2) SMUHSD schools are accessible from 6am-8pm for all school days. Assumes public access is available from 6am-8am and 3:30 to closing.
(3) Millbrae School District includes Lomita Park, Meadows, Green Hills, Spring Valley Elementary Schools, and Taylor Middle School. Percent of public use based on a weighted average of public use times for five schools. Schools are assumed to be accessible from 6am-8pm for all school days except for Taylor Middle School which is accessible until 10pm and Lomita Park which is accessible until 7pm.

Sources: Millbrae School District; Use Agreements between City and SMUHSD; City of Millbrae Parks, Open Space, and Conservation Element; City of Millbrae; EPS.

Table 15 Millbrae School District Land Acreage

Millbrae School District	Sq.Ft.	Acres	Notes
Lomita Park Elementary	43,460	1.00	Clear and Grub Field
Meadows Elementary	65,350	1.50	Clear and Grub Field
Green Hills Elementary	69,282	1.59	Clear and Grub Field (upper field is 20,916 Sq.Ft.; lower field is 48,366 Sq.Ft.)
Spring Valley Elementary	64,785	1.49	Clear and Grub Field
Taylor Middle School	205,000	4.71	Clear and Grub Field
Total	**447,877**	**10.28**	

Source: Carducci & Associates, Inc.

Table 16 Parks and Recreation Citywide Service Standard and Costs

Item	Assumptions	Equation
SERVICE STANDARDS		
Service Population (1)	24,036 serv. pop.	*a*
Developed City Parkland		
City Parks	41.8	
Within 1/2 Mile Radius of MSASP (2)	26.9	*b*
School District Fields/ Playgrounds	22.0	
Total Developed Parkland	63.8	*c*
Implied Citywide Existing Service Standard(s)	2.65 acres per 1,000 serv. pop. (includes school acres)	*d = c / (a/1,000)*
	1.12 acres per 1,000 serv. pop. (excludes. school acres and parkland outside of 1/2 mile radius)	*e = b / (a/1,000)*
Applied Citywide Service Standard		
Residential Development:	2.65 acres per 1,000 serv. pop.	*d*
Non-Residential Development:	1.12 acres per 1,000 serv. pop.	*e*
UNIT COSTS		
Average Land Cost per Acre	$3,050,000 per acre	*f*
Average Development Cost per Acre	$630,663 per acre	*g*
Average Parkland and Development Cost	$3,680,663 per acre	*h = f + g*
Average Parks Cost per Service Population		
Residential	$9,766 per serv. pop.	*i = (h * d) / 1,000*
Non-Residential	$4,119 per serv. pop.	*j = (h * e) / 1,000*

(1) Millbrae population (23,136) as reported by California Department of Finance for January 1, 2016. Millbrae jobs (4,500) as reported by U.S. Census Bureau (LEHD OnTheMap) for 2014 (the latest year available). Survey of parks in other California jurisdictions have generally found employee use/ demand for parks at a level that is about one-fifth to one-half of the demand from one resident. Without Millbrae-specific surveys, the approach taken here is to be at conservative end of range; i.e. assume 5 employees are equivalent to one resident in terms of park demand/ use, or a 0.2 resident equivalence per employee. This level of employee demand is subsequently applied to all categories of non-residential development.
(2) Non-residential calculations include parkland within 1/2 mile radius of the MSASP area.

Unit Costs and Fee Estimates

As shown in **Table 16**, the 2015 MSASP Feasibility Study provided estimates of per land acre acquisition cost at $3.05 million per acre and the parkland development cost at $631,000 per acre. When combined with the existing service standard, this indicates the need for an average

parks and recreation capital facility investment of $9,766 per new resident and $4,119 per non-residential service population equivalent to maintain the existing service standards.

The per residential and non-residential service population parks costs was applied to the estimated service population for each appropriate land use type to derive the supportable development impact fee by land use for parks and recreation. Household size assumptions for the parks and recreation fee estimate were based on the American Community Survey of persons per multifamily renter-occupied unit, reflecting an average of 2.16 persons per household. [6] The employment densities applied were the same as those indicated in **Table 2** of this Technical Report.

Table 17 shows the MSASP development impact fee schedule for parks and recreation facilities. As shown the cost per new service population is applied to the estimated service population associated with each land use category to derive the fee by land use.

[6] It is recognized that the City's municipal code associated with parks indicates a general assumption of 2.0 persons per multifamily household, and that ABAG indicates an overall average of 2.65 persons per household for the City of Millbrae (also reported in the MSASP DEIR). The American Community Survey (2011-2015) provides a more specific household size for multifamily units. Specifically, it indicates 3,634 people live in 1,679 renter-occupied units (multifamily development of 5 units or more), resulting in an average of 2.16 persons per household.

Table 17 Derivation of Parks and Recreation Development Impact Fees

Land Use	Population/ Employment Density (1) *a*	Resident Equivalent *b*	Service Population *c = (a) x (b)*	Parks Fee *d = (e) or (f) x (c)*	Administrative Fee (2%) *g = (d) * (1.02)*
Average Parks Capital Cost per Residential Service Population *(e)*				**$9,766**	
Average Parks Capital Cost per Non-Residential Service Population *(f)*				**$4,119**	
Residential (multifamily)	2.16 pers./ unit	1.0	2.16	$21,094 per unit	$21,516 per unit
Office	4.0 jobs/ 1,000 sq. ft.	0.2	0.80	$3.30 per sq. ft.	$3.36 per sq. ft.
Retail	2.5 jobs/ 1,000 sq. ft.	0.2	0.50	$2.06 per sq. ft.	$2.10 per sq. ft.
Industrial/ Non-Retail	1.0 jobs/ 1,000 sq. ft.	0.2	0.20	$0.82 per sq. ft.	$0.84 per sq. ft.
Hotel	0.8 jobs/ room	0.2	0.16	$659 per Room	$672 per Room

(1) Residential density assumptions based American Community Survey of renter-occupied multifamily units. Employment density assumpations based on proposed project buildout program summary in the MSASP DEIR, Table 2-1.

Sources: City Municipal Code; MSASP EIR; Table 1; Economic & Planning Systems, Inc.

Exhibit B

Millbrae Station Area Specific Plan

Prepared for

City of Millbrae

December 2015
Accepted by City Council March 22, 2016

WEST YOST ASSOCIATES
Consulting Engineers

478-12-15-04

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consulting engineers

WATER WASTEWATER STORMWATER

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Millbrae Station Area Specific Plan

Prepared for

City of Millbrae

December 2015

WEST YOST ASSOCIATES
Consulting Engineers

478-12-15-04

Polly L. Boissevain

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List of Acronyms

AB 1600	California Mitigation Fee Act
ADWF	average dry weather flow
BART	Bay Area Rapid Transit
Baykeeper	San Francisco Baykeeper
CAR	Capacity Assurance Report
CIP	Capital Improvement Program
City	City of Millbrae
CPTED	Crime Prevention Through Environmental Design
CSO	Community Service Officer
DEIR	Draft Environmental Impact Report
EB	Eastbound
EIR	Environmental Impact Report
EMS	emergency medical services
FAA	Federal Aviation Administration
fps	feet per second
gpm	Gallons per minute
JPA	Joint Powers Agreement
JUFM	joint use force main
mgd	million gallons per day
MSASP	Millbrae Station Area Specific Plan
MUTCD	Manual on Uniform Traffic Control Devices
NB	Northbound
OSHA	Occupational Safety and Health Administration
PDWF	Peak Dry Weather Flow

List of Acronyms cont'd…

PWWF	Peak Wet Weather Flows
psi	pounds per square inch
RDII	rain-dependent infiltration and inflow
ROW	right-of-way
RTS	return-to-sewer ratio
SB	Southbound
SFPUC	San Francisco Public Utilities Commission
Specific Plan	Millbrae Station Area Specific Plan
SSOs	Sanitary Sewer Overflows
TIF	Transportation Impact Fee
TOD	Transit Oriented Development
WB	Westbound
West Yost	West Yost Associates
WPCP	Water Pollution Control Plant
WSA	Water Supply Assessment
WWTP	wastewater treatment plant

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EXECUTIVE SUMMARY

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ES.1 OVERVIEW/PURPOSE

The City of Millbrae (City) is preparing a Specific Plan[1] and Environmental Impact Report (EIR)[2] for the Millbrae Station Area, a 116-acre area adjacent to the Millbrae Bay Area Rapid Transit (BART) Station. A Specific Plan for the Millbrae Station Area was first adopted in 1998. The 2015 Specific Plan is an update to the 1998 plan to address changed market conditions and future development plans. The 2015 Millbrae Station Area Specific Plan (MSASP) includes transit-oriented development, residential mixed use, and employment and retail centers, as well as three potential hotel sites. Figure ES-1 shows proposed land uses within the Specific Plan area.

As part of the 1998 Specific Plan development, an impact fee was adopted. The City is planning to update the impact fee for the MSASP area. The MSASP Technical Reports evaluate water and sewer utilities, transportation, parks and recreation, and public safety services to determine required infrastructure and/or services to support the MSASP area, estimate costs for implementation of improvements, and, where appropriate, allocation of costs to individual land uses within the MSASP area. A nexus study to update and adopt the impact fee will be performed separately by the City, using information developed in the Technical Reports.

The Technical Report evaluations were prepared by West Yost Associates (water and sewer), W-Trans (transportation), Callander & Associates (parks and recreation) and Citygate Associates (public safety services).

Findings for the water system, sanitary sewer collection system, transportation, parks, and recreation and public safety evaluations are summarized below. All costs presented in the Technical Reports are in 2015 dollars.

ES.2 WATER SYSTEM TECHNICAL REPORT

ES.2.1 Overview

Millbrae's water distribution system is divided into four major pressure zones and includes approximately 75 linear miles of pipe. The water system is supplied by five turnouts from the San Francisco Public Utilities Commission's (SFPUC') Regional Water System. The MSASP is in Zone 4, which serves the lower elevation areas by San Francisco Bay. Zone 4 is supplied by four SFPUC turnouts, located on Murchison Drive, El Camino Real at Victoria Avenue, Magnolia Avenue and Green Hills Drive. The turnout at El Camino Real and Victoria Avenue is within the MSASP area.

Zone 4 has an average daily demand of 1.3 mgd. The MSASP will have an average daily demand of 0.6 mgd at buildout of the plan, approximately 50 percent of current Zone 4 water demand.

[1] Millbrae Station Area Specific Plan, June 2015. Prepared by Placeworks and the City of Millbrae.

[2] Millbrae Station Area Specific Plan Update and Transit-Oriented Development #1 and #2 Draft EIR, June 2015. Prepared by Placeworks for the City of Millbrae.

ES.2.2 Summary of Analysis and Findings

A hydraulic model of the Millbrae water distribution system, developed for the City's 2014 Water Master Plan, was used to evaluate the adequacy of existing infrastructure to meet proposed MSASP land uses. The hydraulic model was used to evaluate peak hour conditions, representing normal operations, and fire flow availability under maximum day demand conditions. Both near-term development and buildout of the MSASP were evaluated.

The MSASP area is currently served by water system pipelines that range from 6-inch diameter to 12-inch diameter. The analysis found that existing infrastructure is generally adequate to meet proposed land uses within the MSASP. The Transit Oriented Development (TOD) 1, proposed to be developed between the BART Station and El Camino Real (see Figure ES-1), will require upgrade of approximately 200 feet of 6-inch diameter pipeline to 8-inch diameter pipeline to meet fire flow requirements, with an estimated project cost of $62,000. No other improvements were identified.

ES.3 SANITARY SEWER COLLECTION SYSTEM AND TREATMENT CAPACITY TECHNICAL REPORT

ES.3.1 Overview

Millbrae's existing gravity collection system is comprised of approximately 55 miles of gravity sewers, ranging in size from 6-inch to 36-inch diameter. Collection system flows are delivered to the Millbrae Water Pollution Control Plant (WPCP), located on the northeast corner of U.S. Highway 101 and Millbrae Avenue.

The City is in the process of upgrading the capacity in its sanitary sewer collection system. Effective November 15, 2010, the City entered into a Consent Decree with San Francisco Baykeeper, the purpose of which is to reduce Sanitary Sewer Overflows (SSOs) in the City's sanitary sewer collection system. In compliance with the Consent Decree, the City is working to reduce the risk of SSOs occurring in its collection system in three ways:

- Comprehensively inspecting the collection system to identify and correct defects;
- Enhancing collection system preventative maintenance activities; and
- Providing hydraulic capacity to convey and treat Peak Wet Weather Flows (PWWF).

The City's Capacity Assurance Report, completed in 2012, developed a capital improvement program (CIP) that, upon its implementation, would provide this necessary capacity within the collection system by increasing selected gravity main sizes, by increasing pump station capacity, and by providing wet weather storage to equalize PWWF. The City's Wet Weather Alternatives Analysis (Wet Weather Alternatives Analysis), finalized in 2014, updated this initial CIP by providing an alternative CIP that met capacity requirements through the reduction of PWWF values in addition to more limited increases in infrastructure capacity. This alternative CIP does not require wet weather storage. The long-term reduction of rain-dependent infiltration and inflow (RDII) and therefore PWWF through rehabilitation, repair, and replacement was judged to be a

more sustainable and cost-effective use of resources than only facility capacity increases combined with the construction of wet weather storage.

Because the MSASP will impact the sanitary sewer flows from the Millbrae Station Area, the collection system analysis evaluated whether the PWWF reduction and facility size increases recommended by the Wet Weather Alternatives Analysis CIP, that the City is currently implementing, continue to provide sufficient capacity in the collection system, or whether the MSASP necessitates further capacity enhancements.

ES.3.2 Analysis and Findings

Two evaluations were performed to analyze the impacts of the MSASP area on the collection system: a hydraulic evaluation of the collection system; and, an evaluation of offsite RDII reductions needed to mitigate increased collection system flows.

A hydraulic model of the City's collection system was used to evaluate the impacts of sanitary sewer flows generated by the development. PWWF were estimated using projected water demands to estimate average dry weather flow (ADWF) contributions to the system, and standard hydrologic methods to estimate PWWF from ADWF. A hydraulic analysis was performed to determine whether any capital improvements identified in the Wet Weather Alternatives Analysis would need to be upsized to account for the additional PWWF generated in the MSASP area that would contribute to sanitary sewer overflows. The Wet Weather Alternatives Study identified the need for improvements to a gravity main that runs along Murchison Avenue, Adrian Avenue and Aviador Avenue. With the additional MSASP flows, a short segment of approximately 260 ft on Adrian Road would need to be upsized from 15-inch diameter to 18-inch diameter, with a total cost of $133,000, in 2015 dollars, to eliminate sanitary sewer overflows.

The Wet Weather Alternatives Study identified RDII reduction projects that would be needed to eliminate the need for wet weather storage at the Millbrae WPCP. That study prioritized basins and sub-basins within the City's collection system where rehabilitation, repair, and/or replacement of sewer mains and laterals would need to be implemented to reduce RDII sufficiently to eliminate the need for wet weather storage at the WPCP. The MSASP area will generate wastewater flows that would require wet weather storage at the WPCP, unless RDII projects are implemented within the City's system to offset flows generated from the MSASP area. The Wet Weather Alternatives Study identified RDII projects for eight sewer sub-basins within the City. Two additional sub-basins would require RDII projects to offset increased peak wet weather flows resulting from development of the MSASP area. These are the Broadway sub-basin 1, a 43 acre area where 70 percent RDII reduction is required, and the Hillcrest 5 sub-basin where 65 percent RDII reduction is required. Improvements for each sub-basin include manhole rehabilitation, upper and lower lateral replacements and rehabilitation of 8-inch mains, with a total estimated capital cost of $10,100,000.

Costs for capacity improvements and RDII reduction projects were allocated to the development areas within the Specific Plan based on their ADWF contribution to the system. Table ES-1 summarizes estimated capital costs and the allocations to each development area, shown on Figure ES-1.

Table ES-1. Estimated Capital Costs Distributed by ADWF Contribution

Development Area	ADWF, gpd	Percentage of ADWF Tributary to Gravity Main Capacity Improvement	Gravity Main Capacity Improvement Cost Distribution, dollars	Percentage of ADWF Contributing to RDII Reduction Requirement	RDII Reduction Cost Distribution, dollars	Total Cost Distribution, dollars
TOD 1	121,153	0%	—	22%	2,181,000	2,181,000
TOD 2	133,254	0%	—	24%	2,399,000	2,399,000
Hotels	41,799	0%	—	6%	753,000	753,000
Residential 1	13,345	0%	—	2%	240,000	240,000
Residential 2	9,638	0%	—	2%	173,000	173,000
Residential 3	14,828	0%	—	3%	267,000	267,000
Residential 4	36,328	24%	32,000	6%	654,000	686,000
Retail 1 and 2	74,484	48%	64,000	14%	1,340,000	1,404,000
Office 1	42,391	28%	37,000	8%	763,000	800,000
Office 2	72,179	0%	—	13%	1,299,000	1,299,000
Total	559,399	100%	133,000	100%	10,069,000	10,202,000

ES.4 TRANSPORTATION TECHNICAL REPORT

ES.4.1 Overview

The MSASP EIR identified several traffic improvement measures to mitigate environmental impacts associated with the MSASP. Conceptual level cost estimates were prepared for traffic-related improvements that are needed, and a fee per person-trip was calculated by dividing the total program costs by the number of net-new person trips associated with the MSASP.

ES.4.2 Summary of Analysis and Findings

Table ES-2 summarizes transportation projects identified in the EIR, and associated cost estimates, in September 2015 dollars. The total program costs for transportation improvements is $23.7 million dollars.

Table ES-2. Estimated Costs for Transportation Improvements

Location	Proposed Improvement	Estimated Project Construction Costs, dollars
El Camino Real/ Millbrae Avenue	Add one northbound right turn land and one westbound right turn lane, each approximately 200 feet long	79,300
El Camino Real/Murchison Avenue	Add one northbound left turn land, one westbound right turn land, and one eastbound left turn lane	915,000
California Drive/ Murchison Avenue	Install traffic signal	241,200
Rollins Road/ Murchison Avenue	Extend westbound left-turn lane	55,400
California Drive Extension	Extend California Drive to the north, past Linden Avenue to intersect with Victoria Avenue	3,864,000
Various	Designate segments as bike routes (install signage and/or sharrows)	16,800
Stations Area	Prepare Multimodel Comprehensive Station Agency Access Plan	350,000
Bay Trail to Aviador Avenue	Construct Class I path along Aviador Avenue that connects to the Bay Trail via a pedestrian/bicycle bridge over US 101	12,165,200
	Total Construction Costs	$17,686,900
	Total Program Cost[(a)]	$23,700,400

[(a)] Includes implementation costs as a percentage of construction costs: environmental approval, 2 percent; design, 12 percent; construction management, 10 percent; overhead and administration, 10 percent

The MSASP EIR estimates that the MSASP will generate a total net addition of 2,697 p.m. peak hour person-trips. Person-trips include trips made by transit, bicycle, walking and vehicle.

The transportation impact fee is calculated as the total program cost divided by the net number of person trips, or $8,788/person-trip.

ES.5 PARKS AND RECREATION TECHNICAL REPORT

ES.5.1 Overview

Millbrae's existing park system consists of 108 acres of total parkland, serving a population of 22,989 residents, or 4.6 acres of parkland per 1,000 residents. The City has set a standard of 5 acres of parkland per 1,000 residents.

The buildout of the MSASP is projected to include 4,640 residents, so the development should contribute, or pay in-lieu fees for 19.12 acres of parkland.

ES.5.2 Summary of Analysis and Findings

Three factors were analyzed to determine the proposed recreation impact fees for the MSASP:

- The construction cost of existing built park and field projects in the Peninsula area
- The construction cost of proposed trail projects in Millbrae
- The cost to purchase land in Millbrae

Cost estimates for recent parks and trail projects in the Peninsula area were reviewed, and updated to provide a consistent cost basis in current (2015) dollars. A total of seven park projects and four trail projects were used to develop a unit cost per acre to implement park or trail improvements. This unit cost is estimated at $630,663/acre.

Parkland acquisition costs were estimated using information from a benchmark study currently being compiled for the City of South Francisco. Land acquisition estimates were used for five neighboring cities. Based on these estimates, the average land acquisition cost was estimated at $3,050,000/acre.

The parks impact fee was calculated by relating the total park acreage required to the proposed number of dwelling units, to estimate a park impact fee per dwelling unit. 1,442 dwelling units are proposed for the MSASP. Therefore, the total impact fee is estimated as the sum of the park and trail improvement costs and the land acquisition costs, in dollars per acre, times the total acreage required, divided by the number of planned units. The resulting park and recreation impact fee is $48,800/dwelling unit.

ES.6 PUBLIC SAFETY TECHNICAL REPORT

ES.6.1 Overview

While Millbrae enjoys a small town character and a small town population of approximately 22,898 residents, the City is in a largely urbanized area. The multi-modal train station complex sees approximately 7,000 commuters per day. Highway 101 and the greater San Francisco Airport region draw many visitors. As such, the City does have a capable public safety force. Policing services are provided through a contract with the County Sheriff's Department. Fire services are part of a multi-community contract. A regional contractor under County direction provides paramedic ambulance service. Police, fire, and ambulance services are all dispatched from one integrated County communication center. All three safety services are thus part of a coordinated, regional system where multiple communities assist each other acting very much like a virtual singular set of agencies.

Therefore, the City has safety services that can draw immediately from the region as if Millbrae was a section of a large metropolitan city. As such, safety services for serious to catastrophic events are provided at a level found in large communities.

The MSASP area is expected to create modest demands on Millbrae public safety services. Impacts from the type of growth envisioned can be mitigated to a less than significant level through police and fire staffing additions over time, and facilities enhancements to the City's existing firefighter training site.

ES.6.2 Summary of Analysis and Findings

The public safety analysis included review of existing levels of police, fire, and emergency medical services in the City, including incident responses, staffing, programs, facilities and budgets. The MSASP documents provided proposed building metrics, usages and probable populations in the MSASP area, along with information on current populations and their agencies, and the quantities of commuters to be protected by the City's public safety departments. This information was used to develop recommended mitigations, associated costs and allocations of costs to the MSASP.

Table ES-3 summarizes recommended mitigations, associated costs and the portion of costs allocated to the MSASP.

Table ES-3. Estimated Costs for Public Safety Improvements

Recommended Mitigation	Estimated Cost, dollars	Cost Allocated to MSASP, dollars
Capital Improvements		
Remodel/upgrade the Millbrae Fire Station #37 training tower and classroom to accommodate training props consistent with multi-story building construction	250,000 - 750,000	250,000 - 750,000
Motorcycle and equipment	53,000	53,000
Community Service Officer vehicle	25,000	25,000
Total Capital Improvements	$328,000 - $828,000	$328,000 - $828,000
Staffing Recommendations		
Provide training for Sheriff's Department staff person in Crime Prevention Through Environmental Design	—	—
Add one motorcycle traffic officer and one full-time Community Service Officer	15,000/year	311,000/year
Add fire department staffing to staff the Fire Department's ladder truck with four firefighters when the first building exceeding three stories is occupied	657,00/year	493,000/year
Total Staffing Recommendations	$1,072,000/year	$804,000/year

A traditional impact fee and/or development agreement contribution can provide for the capital building, vehicle, and equipment costs identified in this report. These items are the firefighter training center remodeling, fire protection systems training props, a police motorcycle, and a Community Service Officer vehicle. The capital costs for these items, subject to an impact fee, range from $328,000 to $828,000.

The staffing costs for new development must be apportioned to only the increases generated by the added development, not any current under-met needs in a community. Based on the analysis, the City, without the increased uses proposed by the Specific Plan, could well have chosen to not add a police traffic motorcycle officer ever, nor an additional Community Service Officer. Given that these positions also would serve the larger community, a reasonable cost apportionment would be 75 percent of the police staff to the Specific Plan area and 25 percent to the existing City budget.

The City's fire services contract provider has chosen to staff ladder trucks with three personnel, given the more suburban residential and light commercial character of the overall service area. Thus, adding a fourth firefighter per day to the ladder truck is 100 percent due to the increased density and height of the development proposed in the MSASP. As with police, the ladder truck will respond to calls throughout the multi-city service area. Given that, 75 percent of the firefighter staffing should also be apportioned to the MSASP area.

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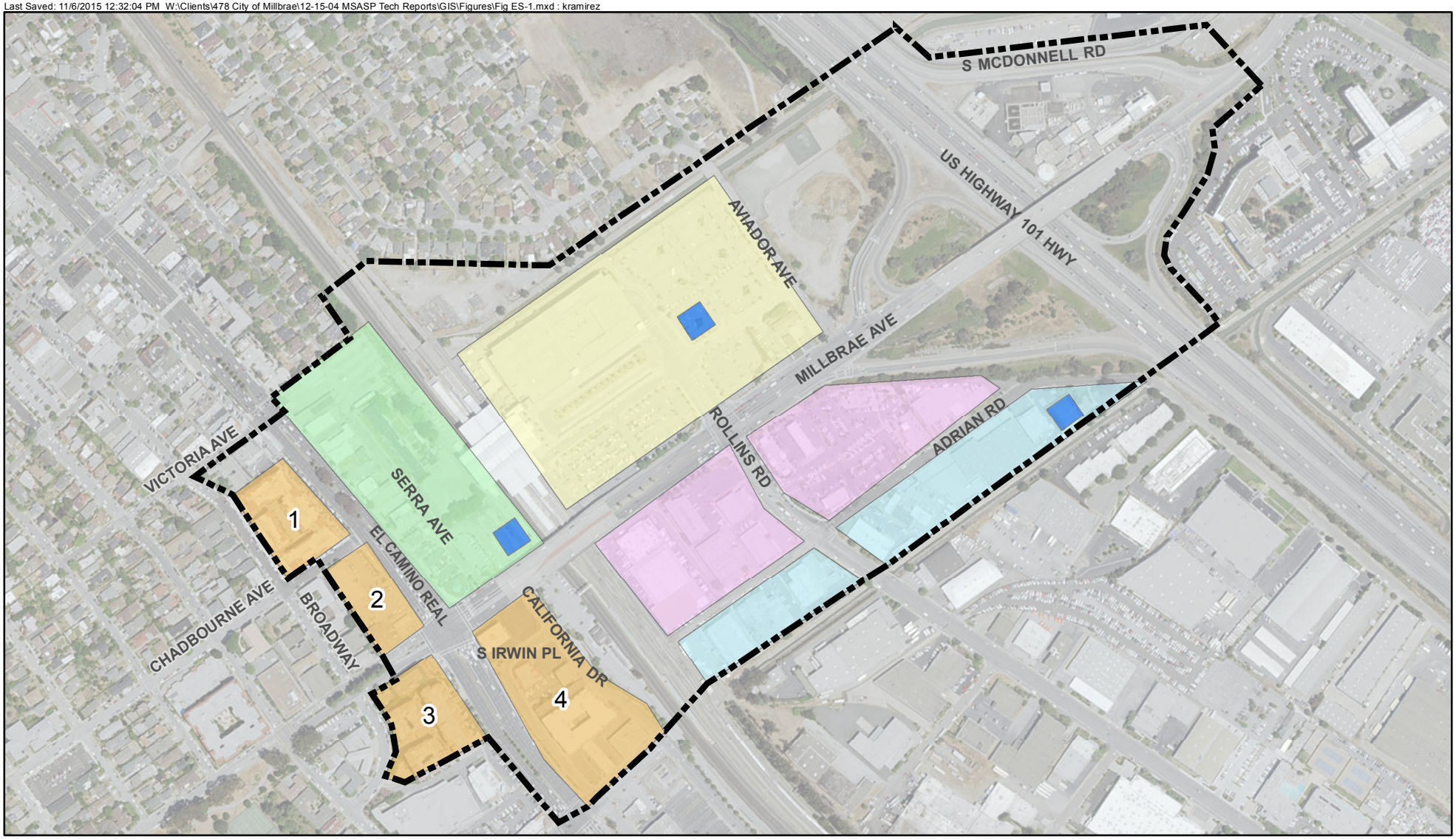

Symbology

- Hotel
- Transit Oriented Development 1
- Transit Oriented Development 2
- Office
- Residential
- Retail
- MSASP Boundary

N

0 250 500

Scale in Feet

WEST YOST ASSOCIATES

Figure ES-1

Millbrae Station Area Specific Plan Land Uses

City of Millbrae
Millbrae Station Specific Plan
Technical Reports

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1. WATER SYSTEM TECHNICAL REPORT

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1.0 EXECUTIVE SUMMARY

The City of Millbrae (City) is updating its Millbrae Station Area Specific Plan (MSASP). At the City's request, West Yost Associates (West Yost) has prepared an analysis of the water system to determine what water system infrastructure is required for development of the MSASP, the estimated cost for the infrastructure and allocations to areas within the MSASP. The City will use information from this analysis to develop a water impact fee for the MSASP.

A hydraulic model, developed for the City's 2014 Water Master Plan, was used to evaluate the adequacy of existing infrastructure to meet proposed MSASP land uses. The hydraulic model was used to evaluate peak hour conditions, representing normal operations, and fire flow availability under maximum day demand conditions. Both near-term development and buildout of the MSASP were evaluated.

The MSASP area is currently served by water system pipelines that range from 6-inch diameter to 12-inch diameter. The analysis found that existing infrastructure is generally adequate to meet proposed land uses within the MSASP. The Transit Oriented Development 1, proposed to be developed between the Bay Area Rapid Transit (BART) station and El Camino Real, will require upgrade of approximately 200 feet of 6-inch diameter pipeline to 8-inch pipeline to meet fire flow requirements, with an estimated project cost of $62,000. No other improvements were identified.

2.0 MSASP OVERVIEW

Existing land uses within the MSASP include mixed use developments west of El Camino Real, light industrial and commercial uses east of El Camino Real and west of the railroad tracks, the Millbrae BART station, and commercial and light industrial users south of Millbrae Avenue.

The MSASP will include a mix of land uses, including transit oriented development, around the Millbrae BART station, residential mixed uses west of El Camino Real, and retail and office developments south of Millbrae Avenue. Figure 1 shows the proposed land uses for the MSASP.

Table 1 summarizes water demand for existing uses and for proposed uses within the MSASP. Existing average day demands for the MSASP development areas were estimated from the hydraulic model, and are based on 2012 water use. Average day demands for proposed uses within the MSASP are from the Millbrae Water Supply Assessment (GHD, 2015), and represent net increased use for the MSASP area, since some areas will be re-developed. As shown in the table, existing average day demand within the MSASP area is 122 gallons per minute (gpm) [0.2 mgd]. With full development of the MSASP, average daily demand will increase to 568 gpm (0.8 mgd). Water demands for proposed uses also include unaccounted for water (the difference between production and demand) to represent the total supply required for MSASP. An unaccounted for water factor of 5.4 percent was used based on the three years reported in the 2014 Water Master Plan.

The table also summarizes maximum day demand and peak hour demand for the MSASP, using peaking factors adopted in the 2014 Water Master Plan. Maximum day demand is estimated as 2.0 times the average day demand and peak hour demand is estimated as 1.75 times the maximum day demand for commercial uses and 1.66 times maximum day demand for residential uses.

Table 1. Existing and Proposed Water Use within the MSASP Area

Area Name	Existing MSASP Water Use[(a)]	Proposed MSASP Water Use[(b)]	Total Existing and Proposed MSASP Water Use
Average Daily Demand, gpm			
Transit Oriented Development 1	18	102	120
Transit Oriented Development 2	0	112	112
Residential	41	63	104
Office	12	71	83
Retail	3	63	66
Hotel	11	35	46
Other	38	0	38
Total (gpm)	122	446	568
Total (mgd)	0.2	0.6	0.8
Maximum Day Demand, gpm			
Transit Oriented Development 1	36	204	240
Transit Oriented Development 2	1	224	225
Residential	81	126	207
Office	24	142	166
Retail	6	126	132
Hotel	22	70	92
Other	76	0	76
Total (gpm)	245	892	1137
Total (mgd)	0.4	1.3	1.6
Peak Hour Demand, gpm			
Transit Oriented Development 1	60	349	479
Transit Oriented Development 2	1	388	449
Residential	134	208	414
Office	42	249	332
Retail	7	220	263
Hotel	38	124	184
Other	129	0	151
Total (gpm)	411	1538	2274
Total (mgd)	0.6	2.2	3.3

[(a)] Existing MSASP Water Use estimated from hydraulic model 2013 demand within the MSASP area.

[(b)] Proposed MSASP average day water use from Millbrae Water Supply Assessment (GHD, 2015). Unaccounted for water added at 5.4 percent. Proposed use is net use, including reductions for existing industrial parcels that will be re-developed.

3.0 WATER SYSTEM DESCRIPTION

Millbrae's water distribution system is divided into four major pressure zones and includes approximately 75 linear miles of pipeline. The water system is supplied by five turnouts from the San Francisco Public Utilities Commission's (SFPUC') Regional Water System. The MSASP is in Zone 4, which serves the lower elevation areas by San Francisco Bay. Zone 4 is supplied by four SFPUC turnouts, located on Murchison Drive, El Camino Real at Victoria Avenue, Magnolia Avenue and Green Hills Drive. The turnout at El Camino Real and Victoria Avenue is within the MSASP area.

Existing system-wide average daily water system demand is 2.1 million gallons per day (mgd). Zone 4 has an average daily demand of 1.3 mgd. Existing maximum day system-wide water system demand is estimated at 4.3 mgd, twice the average daily demand, with Zone 4 maximum day demand estimated at 2.6 mgd.

As summarized in Section 2 and Table 1, the MSASP will have an average daily demand of 0.6 mgd at buildout of the plan, and a maximum day demand of 1.3 mgd, approximately 50 percent of current Zone 4 water demand.

Figure 2 shows the existing potable water pipelines within the Specific Plan area. The area is served by pipelines that range from 6-inch diameter to 12-inch diameter, with the majority of the area served by 8-inch diameter and 10-inch diameter pipe.

4.0 METHODOLOGY AND ANALYSIS CRITERIA

The hydraulic model of the Millbrae water system was used to evaluate near-term and future scenarios with the development of the MSASP to determine whether existing pipelines are adequate to serve the MSASP or new pipelines are required. Although the draft MSASP Environmental Impact Report (EIR) identified potential new water pipelines within the MSASP, pipelines identified in the EIR were not based on hydraulic analysis. Therefore, this analysis used existing pipelines, as identified in the hydraulic model, as a starting point for the analysis.

Analysis criteria to evaluate adequacy of existing pipelines were obtained from the 2014 Water Master Plan and the City's fire marshal. The following criteria were used for the analysis:

Pipeline Allowable Velocities

- Maximum velocity for peak hour demand conditions = 7 feet per second (fps)
- Maximum velocity for maximum day demand plus fire flow conditions = 10 fps

Pressure Criteria

- Minimum pressure for peak hour demand conditions = 40 pounds per square inch (psi)
- Minimum pressure for maximum day demand plus fire flow conditions = 20 psi

Fire Flow Requirements

- Flow rate and duration = 2000 GPM for 4 hours

New Pipeline Sizing

- Minimum pipeline diameter = 8-inch
- Hazen Williams Roughness coefficient = 130

5.0 ANALYSIS RESULTS

5.1 Peak Hour Demand Evaluations

To simulate peak hour conditions, West Yost used the hydraulic model to evaluate pressures at all model locations within the MSASP area and velocities in pipelines within the MSASP. Pressures should be at least 40 psi, and pipeline velocities should be less than 7 fps.

Two scenarios were evaluated:

Scenario 1 – Peak Hour Demands with Near-term Development of the MSASP. This scenario assumes full development of Transit Oriented Development (TOD) 1 and TOD 2, with existing water demands for the rest of the system.

Scenario 2 – Peak Hour Demands with Buildout of the MSASP. This scenario assumes full development of the MSASP with 2035 water system demands for the rest of the system.

For Scenario 1, the hydraulic model results indicate that the peak hour demand pressures within the MSASP range from 101 to 119 psi. For Scenario 2, the hydraulic model results indicate that the peak hour demand pressures within the MSASP range from 98 to 119 psi. Both scenarios meet the minimum system normal operating pressure requirement of 40 psi. All pipelines within the MSASP area have velocities that are less than 7 fps for both scenarios.

5.2 Maximum Day Plus Fire Flow Evaluations

To simulate fire flow conditions, West Yost used the hydraulic model to simulate available flows at all model locations within the MSASP while maintaining 20 psi residual pressure and a maximum pipeline velocity of 10 fps. Two scenarios were evaluated:

Scenario 1 – Maximum Day Demands with Near-term Development of the MSASP. This scenario assumes full development of TOD 1 and TOD 2, with existing water demands for the rest of the system.

Scenario 2 – Maximum Day Demands Buildout of the MSASP. This scenario assumes full development of the MSASP with 2035 water system demands for the rest of the system.

Hydraulic model results from both scenarios indicate that all areas tested have available fire flow that exceed requirements, with the exception of:

- The northwest section of the TOD 1 development just east of El Camino Real
- The residential development west of El Camino Real between Millbrae Avenue and Chadbourne Avenue
- The existing wastewater treatment plant (WWTP) located east of Highway 101

Figure 3 shows locations that do not meet fire flow requirements.

The TOD 1 development is served by on-site pipelines. Approximately 200 feet of 6-inch diameter pipeline should be replaced with 8-inch diameter pipeline to meet fire flow requirements.

Residential development west of El Camino to the north and south of Chadbourne Avenue will be served by the existing water lines on Chadbourne Avenue. The model indicates that there is a 10-inch diameter pipeline, and a parallel 6-inch diameter pipeline in Chadbourne. Analysis results indicate that the 10-inch diameter pipeline is capable of providing the requisite 2,000 gpm fire flow, and the 6-inch diameter pipeline is not. Hydrant laterals for the proposed development should be connected to the existing 10-inch diameter pipeline. Therefore, no improvements are recommended.

Although the existing WWTP is within the MSASP boundary, there is no planned MSASP development in the vicinity of the plant. Fire flows are less than criteria under existing conditions, without development of the MSASP, and are the same with the planned MSASP development. Therefore, no pipeline improvements are recommended that would be attributable to the MSASP proposed development.

6.0 IMPROVEMENTS/MITIGATION REQUIRED

6.1 Summary of Improvements

The following new potable water pipelines are needed for the Specific Plan area, as shown on Figure 4:

- Approximately 200 feet of new 8-inch diameter pipeline east of El Camino Real to serve TOD 1 development

7.0 ESTIMATED PROJECT COSTS

7.1 Pipeline Costs

Construction costs for the proposed water pipeline are estimated using unit costs from the 2014 Water Master Plan, scaled to the July 2015 Engineering News Record Construction Cost Index for San Francisco of 11155. Additionally, a 30 percent construction cost contingency, and a 30 percent implementation multiplier are added to estimate a total project cost. The project has an estimated construction cost of $50,000 (including construction contingency) and $62,000 total project cost.

8.0 COST ALLOCATIONS

Only one minor improvement is required for the TOD 1 development. All of the cost should be allocated to the TOD 1 development.

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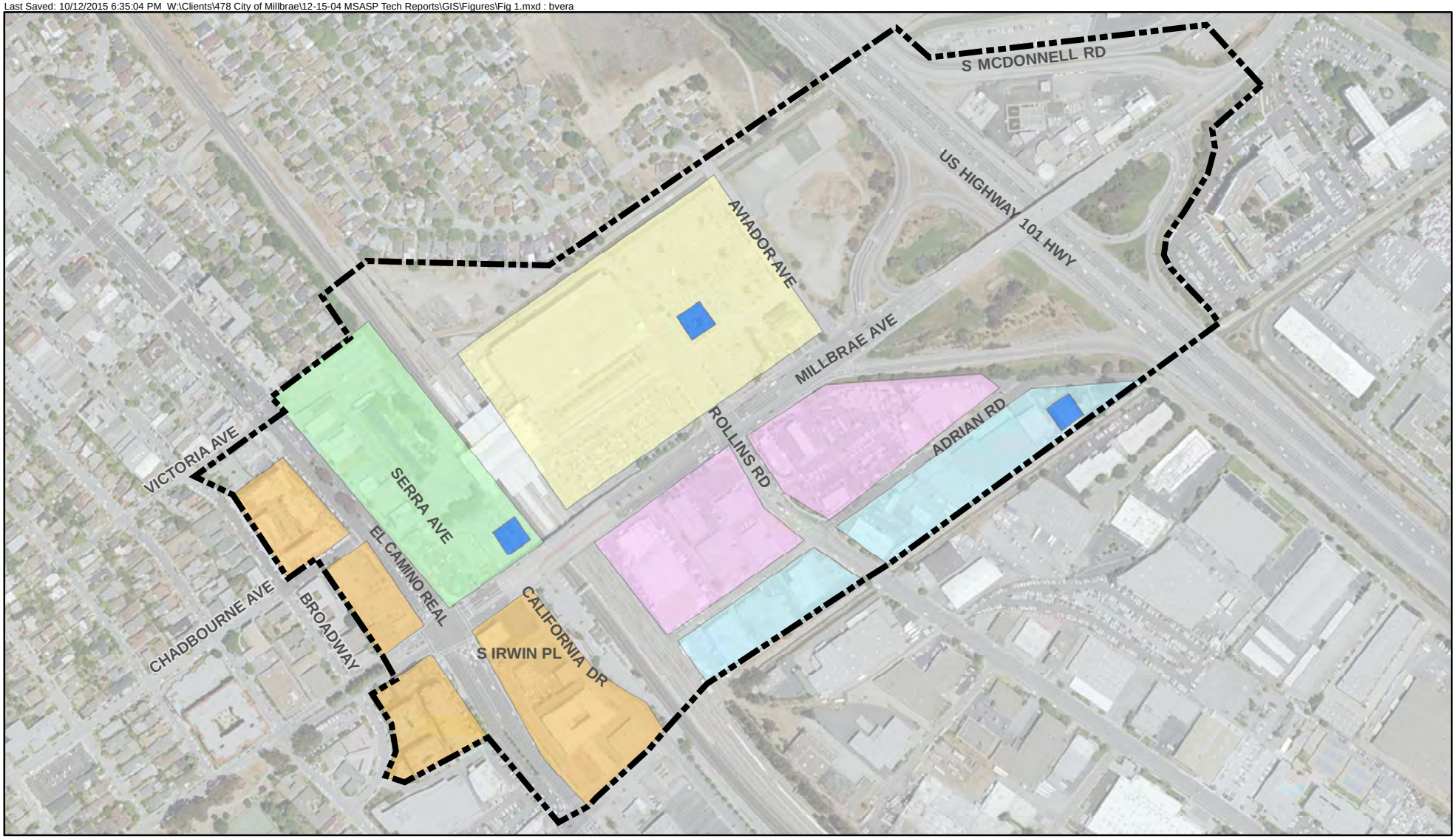

Symbology

- Hotel
- Transit Oriented Development 1
- Transit Oriented Development 2
- Office
- Residential
- Retail
- MSASP Boundary

N

0 250 500

Scale in Feet

WEST YOST ASSOCIATES

Figure 1

Millbrae Station Area Specific Plan Land Uses

City of Millbrae
Millbrae Station Specific Plan
Technical Reports

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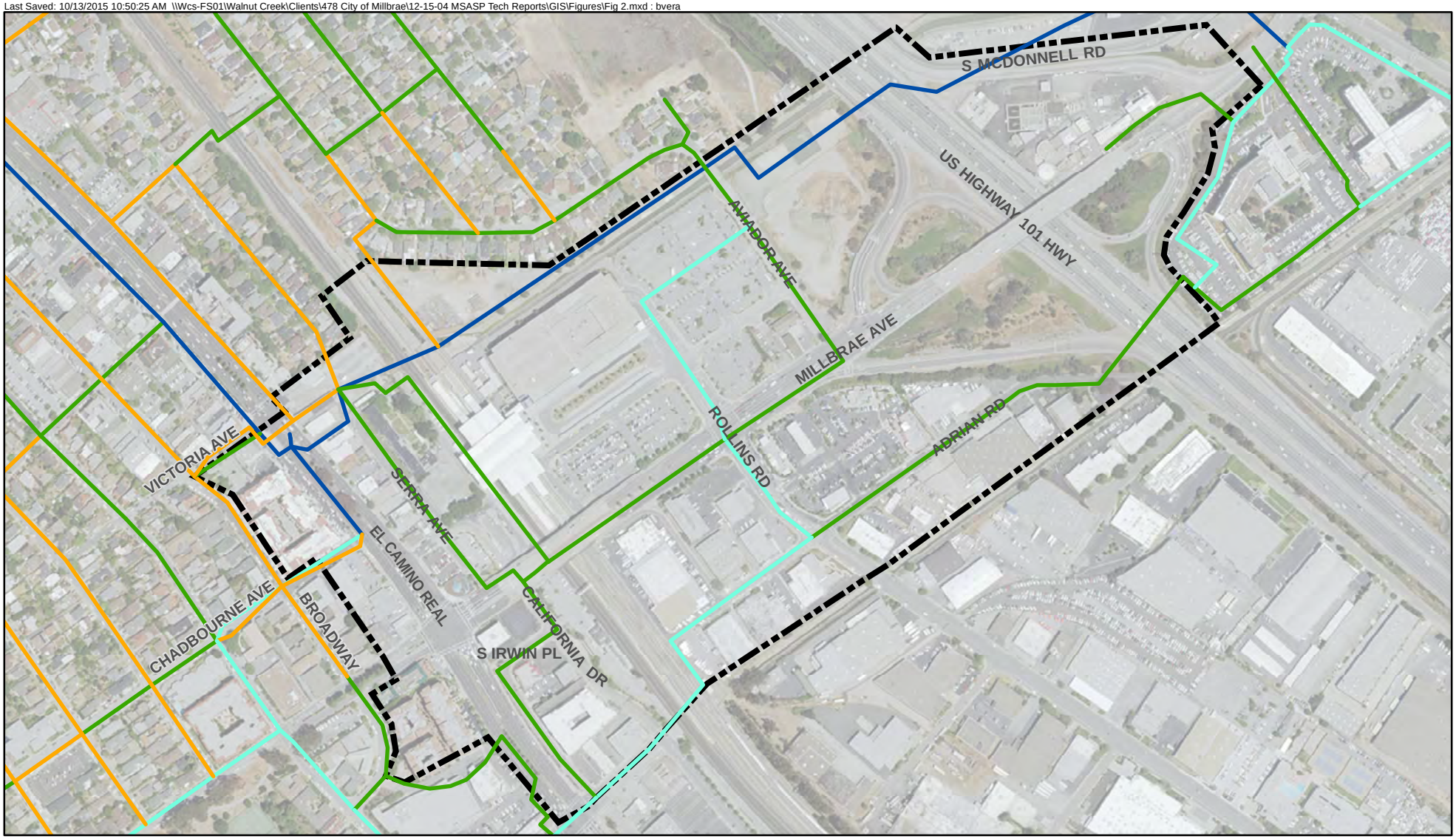

Symbology

- 12-inch Diameter
- 10-inch Diameter
- 8-inch Diameter
- 6-inch Diameter
- MSASP Boundary

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Scale in Feet

WEST YOST ASSOCIATES

Figure 2

Existing Water System Pipe Diameters

City of Millbrae
Millbrae Station Specific Area
Technical Reports

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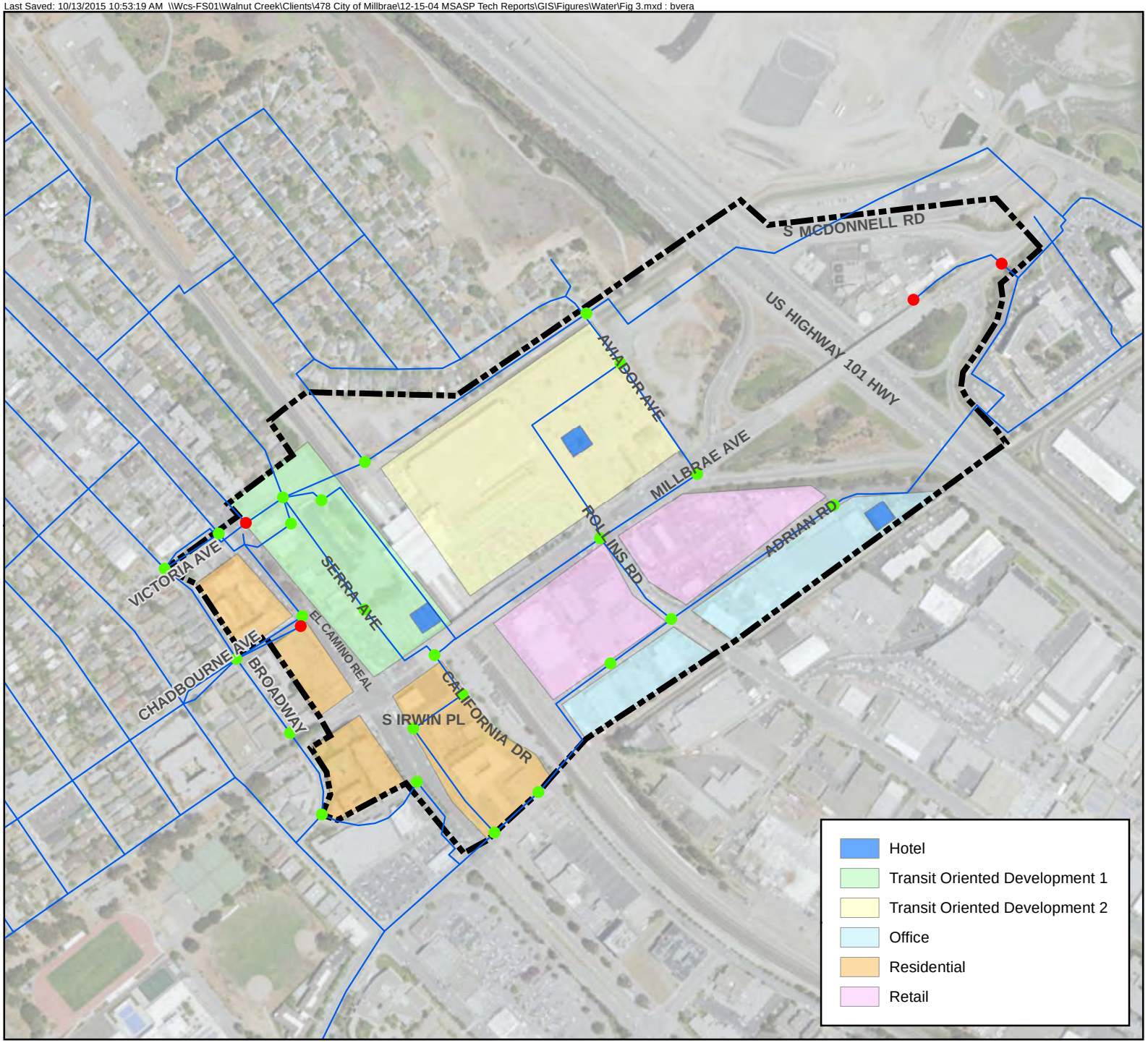

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0 250 500

Scale in Feet

Symbology

- Available Flow at Test Location > 2,000 gpm
- Available Flow at Test Location < 2,000 gpm
- Existing Pipe
- MSASP Boundary

Notes:
1. Results are for both:
   Scenario 1 - Existing System demands with full development of TOD 1 and TOD 2; and Scenario 2 - 2035 system demands with full development of the MSASP.

WEST YOST ASSOCIATES

Figure 3

Available Fire Flow within MSASP

City of Millbrae
Millbrae Station Specific Plan
Technical Reports

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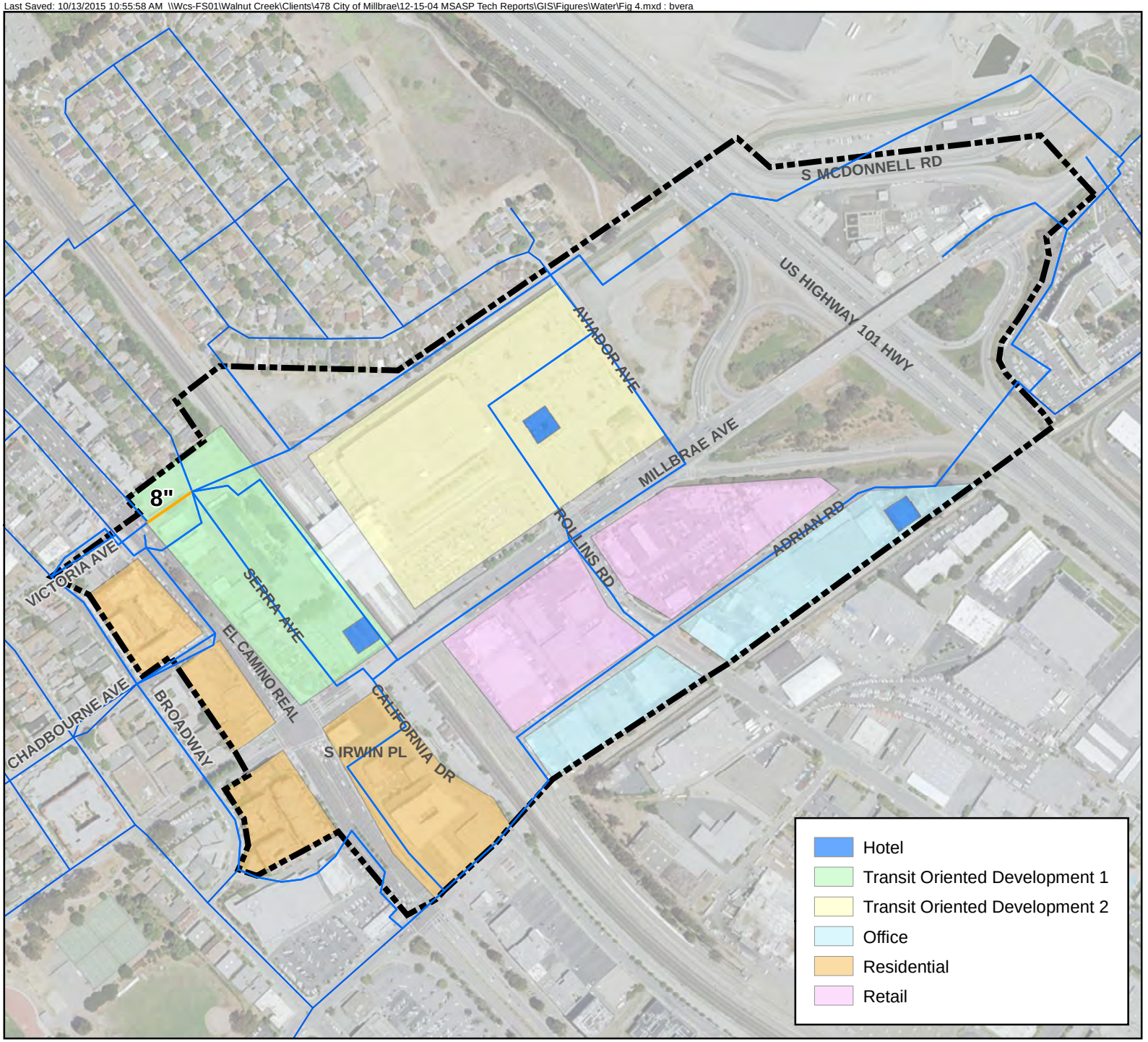

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Scale in Feet

Symbology

- Proposed 8" Diameter Pipe
- Existing Pipe
- MSASP Boundary

WEST YOST ASSOCIATES

Figure 4

Required Pipeline Improvements for MSASP

City of Millbrae
Millbrae Station Specific Plan
Technical Reports

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2. SANITARY SEWER COLLECTION SYSTEM AND TREATMENT CAPACITY TECHNICAL REPORT

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1.0 EXECUTIVE SUMMARY

The Executive Summary encapsulates the evaluation methods used and the recommendations resulting from the Sanitary Sewer Collection System Treatment Capacity Technical Report.

1.1 Background

The City of Millbrae (City) is preparing an Environmental Impact Report (EIR) for the Millbrae Station Area Specific Plan (MSASP), a 116-acre area adjacent to the Millbrae Bay Area Rapid Transit (BART) Station. A Specific Plan for the Millbrae Station Area was first adopted in 1998. The MSASP is an update to the 1998 plan to address changed market conditions and future development plans. The MSASP includes transit-oriented development, residential mixed use, and employment and retail centers, as well as three potential hotel sites. The development within the MSASP will impact sanitary sewer flows from the Millbrae Station Area.

Because the MSASP will impact the sanitary sewer flows from the Millbrae Station Area, it is necessary to evaluate whether the Peak Wet Weather Flow (PWWF) reduction and facility size increases recommended by the Wet Weather Alternatives Analysis Capital Improvement Program (CIP) that are currently being implemented by the City continue to provide sufficient capacity in the collection system, or whether the MSASP necessitates further capacity enhancements. This report evaluates the capacity impacts of the MSASP on the City's sanitary sewer collection system.

The MSASP is in the eastern corner of the City, bisected in one direction by Millbrae Avenue and in the other direction by the BART right-of-way (ROW). The MSASP is relatively near to the Water Pollution Control Plant (WPCP), and sewer from this area flows by gravity to the WPCP.

There are two primary routes for sanitary sewer flow in the vicinity of the MSASP:

- The 14-inch and 16-inch gravity mains that flow northeast in the alley between Victoria Avenue and Chadbourne Avenue, cross under El Camino Real, and cross under the BART ROW to join the parallel 12-inch and 18-inch gravity mains that run along the Highline Canal.
- The 10-inch, 12-inch, and 15-inch gravity mains that flow northeast along Murchison Drive and Adrian Road before turning northwest in Aviador Avenue.

These two flow routes join at the intersection of Aviador Avenue and the Highline Canal. From this point a 36-inch gravity main runs under Highway 101 and flows to the WPCP. The route down Murchison Drive/Adrian Road/Aviador Avenue has been identified as capacity deficient and has pipeline improvements described in the Wet Weather Alternatives Analysis CIP.

1.2 MSASP Sanitary Sewer Flows

Average Dry Weather Flow (ADWF) values were developed for each of the individual development areas within the MSASP utilizing water demand assumptions. Water demands for each development area were obtained from Appendix A of the 2015 Water Supply Assessment (WSA) prepared for the City. Water demands were converted to ADWF using a return-to-sewer (RTS) ratio of 0.87. Peak Dry Weather Flow (PDWF) was generated in the hydraulic model via

the application of residential and non-residential diurnal curves to the appropriate ADWF. Consistent with prior planning studies, the RTK method was used to calculate Rainfall Dependent Inflow and Infiltration (RDII) inputs to the City's hydraulic model and thereby calculate PWWF. The RTK method generates hydrographs from each subcatchment that represent estimated flows during and immediately after rainfall events caused by potential seepage of water into the collection system.

1.3 Recommended Gravity Main Improvements for MSASP Flows

Table ES-1 presents the recommended gravity main improvements identified in the Wet Weather Alternatives Analysis, as well as the further improvements required with the MSASP sanitary sewer flows. The further improvements are highlighted in red. As shown, a single gravity main segment in Adrian Avenue is added to the improvements with the inclusion of the MSASP flows. The required improvements are shown on Figure 5.

Although the MSASP flows require only a single diameter change improvement beyond the improvements that have already been identified in the CIP for the Wet Weather Alternatives Analysis, it should be noted that it is recommended that the entire Murchison/Adrian/Aviador improvement project be completed before the MSASP sanitary sewer flows are discharged to the collection system. Otherwise, increased flows are being discharged to an already capacity-challenged portion of the collection system.

Table ES-1. Murchison/Adrian/Aviador Alignment Gravity Main Capacity Improvements

Location	Pipe Segment ID	Existing Diameter, in	Wet Weather Alternatives Analysis Proposed Diameter, in	MSASP Proposed Diameter, in	Length, ft
Murchison Avenue	224052-224063	10	12	12	46
Murchison Avenue	224063-221001	10	12	12	253
Murchison Avenue	221001-221002	10	12	12	165
Murchison Avenue	221002-221041	10	12	12	150
Murchison Avenue	221041-221042	10	12	12	131
Murchison Avenue	221042-221064	10	12	12	154
Murchison Avenue	221064-221010	10	12	12	194
Murchison Avenue	221010-221011	10	12	12	253
Murchison Avenue	221011-221025	10	12	12	92
Adrian Avenue	221020-221021	15	15	18	257
Aviador Avenue	221021-221026	12	18	18	51
Aviador Avenue	221026-221023	12	18	18	235
Aviador Avenue	221023-221024	12	18	18	137
Aviador Avenue	221024-221030	12	18	18	58
Aviador Avenue	221030-115065	12	18	18	216

Table ES-1. Murchison/Adrian/Aviador Alignment Gravity Main Capacity Improvements

Location	Pipe Segment ID	Existing Diameter, in	Wet Weather Alternatives Analysis Proposed Diameter, in	MSASP Proposed Diameter, in	Length, ft
Aviador Avenue	115065-115064	12	18	18	290
Aviador Avenue	115064-115063	12	18	18	244

1.4 Recommended RDII Reduction Projects for MSASP Flows

Two sub-basins were added to the reduction requirements in the Broadway Basin and two sub-basins were added to the reduction requirements in the Hillcrest Basin beyond those recommended in the Wet Weather Alternatives Analysis. The basins and sub-basins identified for RDII reduction are shown in Table ES-2. The sub-basins required to offset the MSASP flows are highlighted in red. All other sub-basins are required to meet the requirements of the Wet Weather Alternatives Analysis.

Table ES-2. RDII Reduction Targets With Both Wet Weather Alternatives Analysis and MSASP Requirements Included

Basin	Sub-Basin	Drainage Area, ac	Existing Basin R-factor	Proposed RDII Reduction Method	Approximate % RDII Reduction				Projected R-factor
					Fast	Medium	Slow	Total	Total
Madrone	1	43.4	10.4%	Rehab Mains, MHs, Lower & Upper Laterals	85%	64%	—	70%	3.1%
	2	38.3	10.4%	Rehab Mains, MHs, Lower & Upper Laterals	85%	64%	—	70%	3.1%
	3	20.4	10.4%	Rehab Mains, MHs, Lower & Upper Laterals	85%	64%	—	70%	3.1%
	8	45.8	10.4%	Smoke Testing / Inflow Disconnections	20%	-	—	10%	9.4%
Broadway	1	42.6	7.0%	Rehab Mains, MHs, Lower & Upper Laterals	70%	-	—	70%	2.1%
	4	74.9	7.0%	Smoke Testing / Inflow Disconnections	10%	-	—	10%	6.3%
Hillcrest	1	23.7	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%
	2	25.6	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%
	3	31.8	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%
	4	67.8	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%
	5	28.0	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%

1.5 Estimated Construction Costs and Cost Allocations

Estimated construction costs were developed for the recommended gravity main and RDII reduction projects. The estimated construction costs for the required improvement/mitigation projects were allocated by ADWF to each of the development areas. Because only the Residential 4, Retail 1, Retail 2, and Office 1 Development Areas are upstream of and contribute to the required gravity main improvement, costs for this improvement were distributed among only these development areas. Because all development areas contribute to the requirement that RDII be reduced so that the PWWF doesn't exceed the WPCP treatment and equalization capacity, the costs for the RDII reduction projects were distributed among all development areas. The cost allocations are presented in Table ES-3.

Table ES-3. Estimated Construction Costs Distributed by ADWF Contribution

Development Area	ADWF, gpd	Percentage of ADWF Tributary to Gravity Main Capacity Improvement	Gravity Main Capacity Improvement Cost Distribution, dollars	Percentage of ADWF Contributing to RDII Reduction Requirement	RDII Reduction Cost Distribution, dollars	Total Cost Distribution, dollars
TOD 1	121,153	0%	—	22%	2,181,000	2,181,000
TOD2	133,254	0%	—	24%	2,399,000	2,399,000
Hotel 1	13,933	0%	—	2%	251,000	251,000
Hotel 2	13,933	0%	—	2%	251,000	251,000
Hotel 3	13,933	0%	—	2%	251,000	251,000
Residential 1	13,345	0%	—	2%	240,000	240,000
Residential 2	9,638	0%	—	2%	173,000	173,000
Residential 3	14,828	0%	—	3%	267,000	267,000
Residential 4	36,328	24%	32,000	6%	654,000	686,000
Retail 1	37,242	24%	32,000	7%	670,000	702,000
Retail 2	37,242	24%	32,000	7%	670,000	702,000
Office 1	42,391	28%	37,000	8%	763,000	800,000
Office 2	72,179	0%	—	13%	1,299,000	1,299,000
Total	559,399	100%	133,000	100%	10,069,000	10,202,000

2.0 BACKGROUND AND OVERVIEW

The City is preparing an EIR for the MSASP, a 116-acre area adjacent to the Millbrae BART Station. A Specific Plan for the Millbrae Station Area was first adopted in 1998. The MSASP is an update to the 1998 plan to address changed market conditions and future development plans. The MSASP includes transit-oriented development, residential mixed use, and employment and retail centers, as well as three potential hotel sites. The development within the MSASP will impact sanitary sewer flows from the Millbrae Station Area.

The City is in the process of upgrading the capacity in its sanitary sewer collection system. Effective November 15, 2010, the City entered into a Consent Decree with San Francisco Baykeeper (Baykeeper), the purpose of which is to reduce Sanitary Sewer Overflows (SSOs) in the City's sanitary sewer collection system. In compliance with the Consent Decree, the City is working to reduce the risk of SSOs occurring in its collection system in three ways:

- Comprehensively inspecting the collection system to identify and correct defects;
- Enhancing collection system preventative maintenance activities; and
- Providing hydraulic capacity to convey and treat PWWF.

The City's Capacity Assurance Report (CAR), completed in 2012, developed a CIP that upon its implementation would provide this necessary capacity within the collection system by increasing selected gravity main sizes, by increasing pump station capacity, and by providing wet weather storage to equalize PWWF. The City's Wet Weather Alternatives Analysis (Wet Weather Alternatives Analysis), finalized in 2014, updated this initial CIP by providing an alternative CIP that met capacity requirements through the reduction of PWWF values in addition to more limited increases in infrastructure capacity. This alternative CIP does not require wet weather storage. The long-term reduction of RDII and therefore PWWF through rehabilitation, repair, and replacement was judged to be a more sustainable and cost-effective use of resources than only facility capacity increases combined with the construction of wet weather storage.

Because the MSASP will impact the sanitary sewer flows from the Millbrae Station Area, it is necessary to evaluate whether the PWWF reduction and facility size increases recommended by the Wet Weather Alternatives Analysis CIP that are currently being implemented by the City continue to provide sufficient capacity in the collection system, or whether the MSASP necessitates further capacity enhancements. This report evaluates the capacity impacts of the MSASP on the City's sanitary sewer collection system.

3.0 DESCRIPTION OF EXISTING SANITARY SEWER COLLECTION SYSTEM

This section describes the City's existing collection system, including the gravity mains, the Madrone PS and associated force main, and the WPCP.

3.1 Gravity Collection System

The existing gravity collection system is comprised of approximately 55 miles of gravity sewers, ranging in diameters between 6- and 36-inches as shown on Figure 1. The majority of the system (83 percent) is composed of vitrified clay pipe.

3.2 Madrone PS

The existing Madrone PS is a wet well/dry well station. The Madrone PS has three pumps each with a rated capacity of 900 gallons per minute at 35 feet of total dynamic head. The rated firm capacity (i.e., the capacity of the pump station with the largest pump out of service) is approximately 2.5 million gallons per day (mgd).

The Madrone PS electrical service is 240 volts, in three phases, with a 200 amp capacity. Utility power is backed up by a 50 kilowatt standby generator. The existing power system is sufficient for the current loads.

3.3 Madrone Force Main

The existing 14-inch diameter force main is composed of ductile iron, installed circa 1980. The force main has not been recently inspected; therefore, its condition is not known at this time. The existing force main capacity is approximately 5.5 mgd, based on limiting the force main velocity to 8.0 feet per second (fps).

3.4 Water Pollution Control Plant

The WPCP is located on the northeast corner of US Highway 101 and Millbrae Avenue. The wet weather hydraulic and treatment capacity of the WPCP is 9.0 mgd, and it has approximately 1.3 million gallons of flow equalization that allow the WPCP to accept up to 13.8 mgd during PWWF.

Effluent from the WPCP is discharged through a joint outfall pipeline (the joint use force main (JUFM)) under a Joint Powers Agreement (JPA) with the City of Burlingame, the City of San Bruno, the City of South San Francisco, the City and County of San Francisco (San Francisco International Airport) to a deep water outfall at Oyster Point in San Francisco Bay. Under the JPA, the City has hydraulic capacity rights to 9.0 mgd in the JUFM and outfall.

3.5 Study Area Collection System Details

The MSASP can be seen on Figure 2. The MSASP is in the eastern corner of the City, bisected in one direction by Millbrae Avenue and in the other direction by the BART ROW. The MSASP is relatively near to the WPCP, and sewer from this area flows by gravity to the WPCP without need for pumping at the Madrone Pump Station.

There are two primary routes for sanitary sewer flow in the vicinity of the MSASP:

- The 14-inch and 16-inch gravity mains that flow northeast in the alley between Victoria Avenue and Chadbourne Avenue, cross under El Camino Real, and cross under the BART ROW to join the parallel 12-inch and 18-inch gravity mains that run along the Highline Canal.
- The 10-inch, 12-inch, and 15-inch gravity mains that flow northeast along Murchison Drive and Adrian Road before turning northwest in Aviador Avenue.

These two flow routes join at the intersection of Aviador Avenue and the Highline Canal. From this point a 36-inch gravity main runs under Highway 101 and flows to the WPCP. The route down Murchison Drive/Adrian Road/Aviador Avenue has been identified as capacity deficient and has pipeline improvements described in the Wet Weather Alternatives Analysis CIP. As is described below in more detail, any deficiencies and improvements identified for the 2015 Specific Plan Area as part of this study must be placed in the context of the improvements already identified for this area.

4.0 METHODOLOGY AND ANALYSIS CRITERIA

The methodology used to evaluate the MSASP impacts to the sanitary sewer system and the analysis criteria used to quantify this impact are described below.

4.1 Sanitary Sewer Evaluation Methodology

The sanitary sewer flow projections and the methodology used to evaluate the impacts of these flows are described in the following section.

4.1.1 MSASP Sanitary Sewer Flow Development Methodology

ADWF values were developed for each of the individual development areas within the MSASP utilizing water demand assumptions. Water demands for each development area were obtained from Appendix A of the 2015 WSA prepared for the City. Water demands were converted to ADWF using a RTS ratio of 0.87. This RTS ratio is implicitly defined in the WSA Appendix A footnotes, which define water demand as 115 percent of sewer flow. This RTS value is similar to the value of 0.90 that was calculated during the development of the calibrated hydraulic model for the CAR. ADWF values for each development area are presented in Table 1.

Table 1. MSASP Sanitary Sewer Flow by Development Area

Development Area	Water Average Day Demand, gpd	Average Dry Weather Flow[(a)], gpd
TOD 1	139,326	121,153
TOD2	153,242	133,254
Hotel 1	16,023	13,933
Hotel 2	16,023	13,933
Hotel 3	16,023	13,933
Residential 1	15,347	13,345
Residential 2	11,084	9,638
Residential 3	17,052	14,828
Residential 4	41,777	36,328
Retail 1	42,828	37,242
Retail 2	42,828	37,242
Office 1	48,750	42,391
Office 2	83,006	72,179
Total	643,309	559,399

[(a)] Average Dry Weather Flow was calculated as 0.87 multiplied by Average Day Water Demand.

PDWF is generated in the hydraulic model via the application of residential and non-residential diurnal curves to the appropriate ADWF. Both the residential diurnal curves, which vary by flow monitoring basin within the City, and non-residential diurnal curves, which are standard across the City, were calculated during the hydraulic model calibration process that took place during development of the CAR.

The RTK method is used to calculate RDII inputs to the City's hydraulic model and thereby calculate PWWF. The RTK method generates hydrographs from each subcatchment that represent estimated flows during and immediately after rainfall events caused by potential seepage of water into the collection system. The RTK method generates a series of three triangular hydrographs that represent short-term, medium-term, and long-term rainfall response. The RTK parameters include:

1. R is the area of the graph representing the portion of rainfall falling on a subcatchment that enters the sewer collection system.
2. T is the time from the onset of rainfall to the peak of the triangle.
3. K is the ratio of the "time to recession" to the "time to peak" of the hydrograph.

Because the RTK method is based upon the percentage of rainfall that falls on a specific area entering the collection system, and because the redevelopment in the MSASP does not change the area served by the collection system, it was assumed that the amount of RDII entering the collection system was not impacted, and RDII values were not altered in the hydraulic model.

4.1.2 Hydraulic Analysis Methodology

The sanitary sewer flows developed as described above were loaded to manholes in the hydraulic model. The *MSASP Final Screencheck Draft* proposed several gravity mains to be part of the private development that help to determine the loading pattern. These gravity mains were added to the hydraulic model. Additionally, some existing gravity mains that were not considered part of the trunk collection system and that were therefore not included in the original model were added to the model because they will be critical in conveying MSASP flows. The proposed private gravity mains, the additional modeled gravity mains, and the sanitary sewer flow loading location for each of the development areas in the MSASP, can be seen on Figure 3.

The TOD 1 Development Area is identified for redevelopment directly over the 14-inch and 16-inch gravity mains that flow northeast in the alley between Victoria Avenue and Chadbourne Avenue, between El Camino and the BART ROW. The *MSASP Final Screencheck Draft* proposed abandoning the gravity mains beneath the TOD 1 Development Area and routing flows around the development area to the north. Because these changes were recommended, they were evaluated in the hydraulic model. However, as will be discussed below, these changes would be difficult to implement and maintain, and it is recommended that the existing alignment be maintained if possible by strategically locating new development.

The baseline scenario used for the hydraulic analysis was the CIP scenario developed for the Wet Weather Alternatives Analysis. That scenario contains all of the improvements, both capacity increases and RDII reduction projections, required to meet the City's criteria prior to the application of the MSASP sanitary sewer flows. The analysis in this report evaluates the impact

of the MSASP flows on the proposed CIP infrastructure from the Wet Weather Alternatives Analysis, and identifies the collection system improvements beyond those already identified required for the MSASP flows.

4.2 Hydraulic Analysis Criteria

The criteria used in the hydraulic analysis are broken down by sanitary sewer infrastructure type.

4.2.1 Design Storm Criteria

Design storms are synthetic rainfall events used to evaluate collection system capacity under wet weather flow conditions. A design storm has a specific recurrence interval and rainfall duration. The design storm specified for this study is consistent with that used in the CAR and the Wet Weather Alternatives Analysis. The design storm is a rainfall event with a 10-year recurrence interval and 24-hour duration (10-year, 24-hour storm). This design storm is defined in the Consent Decree between the City and Baykeeper as having a total depth of 3.14 inches as measured at the San Francisco International Airport. The rainfall is distributed using the U.S. Soil Conservation Service (now Natural Resource Conservation Service) Type IA rainfall distribution curve.

4.2.2 Existing Gravity Main Hydraulic Capacity Criteria

The gravity main hydraulic capacity criteria are intended to be used as planning tools to determine when flows are considered to have exceeded surcharge capacity during a specific storm event. Exceptions to these criteria may be made on a case-by-case basis, depending on specific flow conditions and facility configuration. Capacity improvement projects have been proposed for all capacity deficient pipelines, as discussed below.

For the purposes of this study, and consistent with the CAR and Wet Weather Alternatives Analysis, a gravity main shall be considered to require capacity improvements if flow through that gravity main results in a Hydraulic Grade Line that exceeds the ground level, *i.e.*, if the flow results in a predicted SSO in the hydraulic model under design storm conditions.

4.2.3 New or Replacement Pipeline Design Criteria

New (parallel relief) or replacement pipelines were designed to meet the following criteria. These criteria do not necessarily apply to the rehabilitation and replacement of isolated sections of pipelines within existing alignments:

- Under PDWF conditions, velocity shall remain above 2 fps to facilitate self-cleaning.
- Under PWWF conditions for the design storm, maximum flow depth (d) as compared to pipe inside diameter (D) d/D shall be as follows:
  - 10-inch diameter and smaller: Max d/D = 0.67
  - 12-inch diameter and above: Max d/D = 0.80

Under all conditions, maximum allowable velocity is 10 fps.

4.2.4 Use of the Flow Equalization Facility

The City's existing flow equalization facility is designed to equalize diurnal variation in dry weather flows in order to optimize the treatment process at the WPCP. However, the facility can be used to store wet weather flow as well, when flows into the plant exceed the 9 mgd rating of the WPCP treatment process. For the purposes of evaluation, it was assumed that 1.3 million gallons of storage space are available in the flow equalization facility. Any flow that exceeds both the existing available storage and the WPCP treatment capacity process is assumed to require the construction of new wet weather storage capacity.

5.0 ANALYSIS RESULTS

Hydraulic analysis results for the City's sanitary sewer facilities downstream of the MSASP are presented below.

5.1 Proposed Private Gravity Main Results

Private gravity mains were proposed for the TOD 1 and TOD 2 development areas. These gravity mains will also convey the flow from the Hotel 1 and Hotel 2 development areas, respectively. The hydraulic analysis found that 8-inch diameter gravity mains, installed at a minimum slope of 0.0035, will have sufficient capacity to convey the appropriate MSASP flows.

It should be noted that the alignment proposed by the *MSASP Final Screencheck Draft*, along the southeast frontage of the TOD 1 development area next to the BART ROW, will be a crowded alignment. Care should be taken to avoid conflicts with other utilities and with the BART ROW.

As described above, the TOD 1 development area is identified to be directly over an existing sanitary sewer alignment. The *MSASP Final Screencheck Draft* recommended divert flow to the north, around the development area. Because the existing alignment takes flow under the BART ROW, and because it is considered difficult if not impossible to secure another crossing under the BART ROW, the diverted flow must be brought back to the original alignment to cross under the BART ROW. The result is that the diverted flow must be turned 90 degrees four separate times. The result of the hydraulic evaluation shows that a 18-inch diameter gravity main could be used for the diversion. The increased diameter from the existing alignment is required by the longer distance and therefore lower resulting slopes covered by the diversion. Because the turns required by the diversion would slow and deepen the flow in a critical area, it is recommended that the existing alignment be preserved with an easement and no construction over the gravity main running to the BART ROW undercrossing.

5.2 Impacts to Existing Gravity Main Capacity

The impacts of the MSASP sanitary sewer flows on the existing collection system are shown on Figure 4. As shown, the flows are predicted to cause SSOs in and around both the Highline Canal alignment and the Murchison/Adrian/Aviador alignment. These SSOs are predicted with the CIP described in the Wet Weather Alternatives Analysis already implemented; further collection system improvements beyond those already identified will be required and described below.

5.3 Impacts to Required Treatment Capacity/Wet Weather Storage

With the additional flows, the hydraulic capacity of the treatment plant plus equalization storage available is predicted to be exceeded. The hydraulic model results indicate that 200,000 gallons of wet weather storage (in addition to the 1.3 million gallons of equalization storage already in place as described above) would be required to equalize flows with the addition of the MSASP sanitary sewer flows.

6.0 IMPROVEMENTS/MITIGATION REQUIRED

As described above, the addition of the MSASP sanitary sewer flows requires improvements to the collection system beyond those identified in the CIP for the Wet Weather Alternatives Analysis. The following section identifies these further improvements. It should be noted that these improvements/mitigations do not include the private gravity mains shown on Figure 3. Although the hydraulic model confirmed the sizes required for these private mains, their ultimate hydraulic evaluation and alignment is considered to be the responsibility of the individual development areas. It should be further noted that the flow bypass around the TOD 1 development area is not included in the necessary improvements/mitigations. Because of the hydraulic challenges involved with turning the flow four times prior to passing under the BART ROW, it is recommended that all efforts be made to protect and maintain the current alignment.

6.1 Gravity Main Capacity Improvements

It is the City's policy that capacity restrictions be mitigated with RDII reductions rather than infrastructure capacity increases where feasible and economical. The Murchsion Basin in the collection system was calibrated as having relatively low RDII rates, and therefore RDII reduction projects in this basin will be relatively ineffective. It was recommended in the CIP for the Wet Weather Alternatives Analysis that RDII reduction not be considered in the Murchison Basin, and that pipeline capacity improvements be made in the Murchison/Adrian/Aviador alignment instead. This recommendation remains valid for this study. Table 2 presents the recommended gravity main improvements identified in the Wet Weather Alternatives Analysis, as well as the further improvements required with the MSASP sanitary sewer flows. The further improvements are highlighted in red. As shown, a single gravity main segment in Adrian Avenue is added to the improvements with the inclusion of the MSASP flows. The required improvements are shown on Figure 5.

Although the MSASP flows require only a single diameter change improvement beyond the improvements that have already been identified in the CIP for the Wet Weather Alternatives Analysis, it should be noted that it is recommended that the entire Murchison/Adrian/Aviador improvement project be completed before the MSASP sanitary sewer flows are discharged to the collection system. Otherwise, increased flows are being discharged to an already capacity-challenged portion of the collection system.

**Table 2. Murchison/Adrian/Aviador Alignment
Gravity Main Capacity Improvements**

Location	Pipe Segment ID	Existing Diameter, in	Wet Weather Alternatives Analysis Proposed Diameter, in	MSASP Proposed Diameter, in	Length, ft
Murchison Avenue	224052-224063	10	12	12	46
Murchison Avenue	224063-221001	10	12	12	253
Murchison Avenue	221001-221002	10	12	12	165
Murchison Avenue	221002-221041	10	12	12	150
Murchison Avenue	221041-221042	10	12	12	131
Murchison Avenue	221042-221064	10	12	12	154
Murchison Avenue	221064-221010	10	12	12	194
Murchison Avenue	221010-221011	10	12	12	253
Murchison Avenue	221011-221025	10	12	12	92
Adrian Avenue	221020-221021	15	15	18	257
Aviador Avenue	221021-221026	12	18	18	51
Aviador Avenue	221026-221023	12	18	18	235
Aviador Avenue	221023-221024	12	18	18	137
Aviador Avenue	221024-221030	12	18	18	58
Aviador Avenue	221030-115065	12	18	18	216
Aviador Avenue	115065-115064	12	18	18	290
Aviador Avenue	115064-115063	12	18	18	244

6.2 RDII Reduction Improvements Required

As previously shown on Figure 4, the MSASP sanitary sewer flows are predicted by the hydraulic model to cause SSOs under the design storm PWWF conditions in the vicinity of the Murchison/Adrian/Aviador alignment, and along the Highline Canal alignment. The predicted SSOs have been mitigated along the Murchison/Adrian/Aviador alignment with the gravity main improvements described above. The predicted SSOs along the Highline Canal could also be mitigated through gravity main capacity increases that would involve upsizing the 18-inch gravity main on the southern side of the canal to 24 inches in diameter. However, such gravity main capacity increases would not reduce the peak flow to the WPCP, and wet weather storage would still be required because the WPCP capacity would be exceeded. Therefore, RDII reduction projects were identified to reduce RDII and PWWF during the design storm, eliminating the need for gravity main capacity improvements along the Highline Canal, and for wet weather storage at the WPCP.

As described in the Wet Weather Alternatives Analysis, basins and sub-basins within the City's collection system were prioritized for RDII reduction based upon the condition of the gravity mains. Those sub-basins with the worst gravity main conditions, as identified by Closed Circuit Television inspection and other indicators, were prioritized for rehabilitation, repair, and/or replacement until RDII estimates had been reduced enough to eliminate the need for wet weather storage and to eliminate the need for many gravity main improvements in the CIP. Through focusing on the basins and sub-basins with the worst condition, City resources were prioritized to projects with the highest estimated effectiveness and rate of return. The basins and sub-basins identified for RDII reduction as part of the Wet Weather Alternatives Analysis are shown on Figure 6.

For the RDII reduction projects in this evaluation, all of the assumptions of the Wet Weather Alternatives Analysis were maintained:

1. Collection system facilities requiring rehabilitation will include manholes, sewer mains, and both lower and upper laterals.
2. It is assumed that sewer main rehabilitation for sewers 8 inches in diameter and smaller will involve pipe replacement using pipe bursting, whereas lines 10 inches in diameter or larger will be lined with cured-in-place pipe. Rehabilitation of sewers larger than 12 inches in diameter is not included.
3. Manhole rehabilitation will involve the use of applied coating systems.
4. For sub-basins where the City implements a focused program to rehabilitate privately owned upper laterals, reduction of 70 percent of the initial and intermediate RDII in the sub-basin is projected.

RDII reduction through rehabilitation, repair, and/or replacement was projected in sub-basins until sufficient RDII was reduced to lower PWWF to the point that wet weather storage is not required. The result is that two sub-basins were added to the reduction requirements in the Broadway Basin and two sub-basins were added to the reduction requirements in the Hillcrest Basin. The basins and sub-basins identified for RDII reduction are shown in Table 3. The sub-basins required to offset the MSASP flows are highlighted in red. All other sub-basins are required to meet the requirements of the Wet Weather Alternatives Analysis. The sub-basin RDII reduction projects required to offset the MSASP flows are shown on Figure 7.

Table 3. RDII Reduction Targets With Both Wet Weather Alternatives Analysis and MSASP Requirements Included

Basin	Sub-Basin	Drainage Area, ac	Existing Basin R-factor	Proposed RDII Reduction Method	Approximate % RDII Reduction				Projected R-factor
					Fast	Medium	Slow	Total	Total
Madrone	1	43.4	10.4%	Rehab Mains, MHs, Lower & Upper Laterals	85%	64%	—	70%	3.1%
	2	38.3	10.4%	Rehab Mains, MHs, Lower & Upper Laterals	85%	64%	—	70%	3.1%
	3	20.4	10.4%	Rehab Mains, MHs, Lower & Upper Laterals	85%	64%	—	70%	3.1%
	8	45.8	10.4%	Smoke Testing / Inflow Disconnections	20%	-	—	10%	9.4%

Table 3. RDII Reduction Targets With Both Wet Weather Alternatives Analysis and MSASP Requirements Included

Basin	Sub-Basin	Drainage Area, ac	Existing Basin R-factor	Proposed RDII Reduction Method	Approximate % RDII Reduction				Projected R-factor
					Fast	Medium	Slow	Total	Total
Broadway	1	42.6	7.0%	Rehab Mains, MHs, Lower & Upper Laterals	70%	—	—	70%	2.1%
	4	74.9	7.0%	Smoke Testing / Inflow Disconnections	10%	—	—	10%	6.3%
Hillcrest	1	23.7	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%
	2	25.6	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%
	3	31.8	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%
	4	67.8	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%
	5	28.0	7.2%	Rehab Mains, MHs, Lower & Upper Laterals	65%	65%	65%	65%	2.5%

6.3 Treatment Capacity/Wet Weather Storage Improvement Requirements

If the RDII reduction requirements described above are met, no capacity increase or wet weather storage equalization is required at the WPCP. If the RDII reduction requirements are not implemented, 200,000 gallons of storage (in addition to the 1.3 million gallons of equalization storage already in place as described above) would be required in order to equalize the PWWF such that it will not exceed the combined treatment/existing equalization capacity of the WPCP. It is recommended that the City implement RDII reduction rather than build wet weather storage.

7.0 ESTIMATED CONSTRUCTION COSTS

The estimated construction costs for the required improvements/mitigations are built from unit costs that are applied to the required projects. A description of the unit costs and resulting construction costs is provided below.

7.1 Unit Costs

Independent planning level capital cost estimates were developed for the required collection system improvements. The estimates were prepared using West Yost Associates' experience, published data, and bid results from similar projects. The estimates are considered Class 5 estimates, based on the Association for the Advancement of Cost Engineering International criteria. A Class 5 estimate is defined as a Conceptual Level or Project Viability Estimate, typically with engineering from 0 percent to 2 percent complete. Class 5 estimates are used to complete alternative comparisons, prepare planning level cost scopes, or evaluate design options and form the base work for the Class 4 Design Baseline or Control Estimate. Expected accuracy for Class 5 estimates typically range from minus 50 percent on the low side to plus 100 percent on the high

side, depending on the technological complexity of the project, the reliability of available reference information, and the contingencies used for cost determination.

A combined estimating and construction contingency of 30 percent is used in the estimated construction costs to account for unknown site conditions, design completion level of the project, and bidding climate factors. The total capital costs are developed by adding an allowance of 30 percent to the estimated construction costs to cover planning level activities, environmental reviews, legal, administration, construction services, change orders, and other related items. The following sections describe the estimating procedures used in the analysis for the specific types of facilities under consideration. All unit costs and cost estimates are consistent with those utilized during the wet weather alternatives analysis. All unit costs are indexed to an Engineering News Record Construction Cost Index for San Francisco in July 2015 of 11,115.

7.1.1 Inflow Identification

Smoke testing costs were estimated at a rate of $0.75/LF for field testing and public notification, and $0.50/LF for analysis and project identification. This analysis assumes that the vast majority of inflow reduction projects will be located on private property, and that the cost of inflow source disconnection costs will be borne by the property owner. Thus, no improvement costs are included.

7.1.2 Collection System Rehabilitation

Collection system rehabilitation includes manholes, sewer mains, lower laterals, and upper laterals. Recent bid results were used to estimate the collection system rehabilitation costs, which include: mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and dewatering; erosion, sediment and storm water control; overhead; and profit.

Manhole rehabilitation is assumed to involve the use of applied coating systems. The unit cost for manhole rehabilitation is assumed to be $5,500 per manhole. Sewer main rehabilitation is assumed to consist of the replacement of sewers 8 inches in diameter and smaller using pipe bursting construction methods at $15.00 per inch-diameter-foot. Sewers 6 inches in diameter and smaller are assumed to be replaced with a minimum 8-inch diameter sewer. Rehabilitation of sewers larger than 8 inches in diameter is not included.

Lower lateral rehabilitation involves the point of connection to the sewer main as well as the lateral pipe in the public ROW or easement. A cleanout is typically installed where the lower lateral connects to the upper lateral. The City requires backflow prevention devices in cases, and they are typically installed near the residence or building. Lower lateral rehabilitation is assumed to involve replacement of the existing lower lateral pipe with new 4-inch diameter pipe. The replacement of a lower lateral without replacement of an upper lateral is assumed to cost $4,440 per lateral.

Upper lateral rehabilitation is assumed to involve replacing the existing upper lateral pipe with new pipe from the point of connection to the lower lateral to within 3 feet of the building. This analysis assumes that upper lateral rehabilitation costs are borne by the City and that upper laterals will be rehabilitated at the same time as lower laterals. The cost of combined lower and upper lateral replacement is assumed to be $6,050 per replacement.

7.1.3 Gravity Sewer Capacity Upgrades

Gravity sewer unit costs are based on an evaluation of recent bid tabs for shallow open-cut construction, and are estimated at $17.10 per inch-diameter-foot. Costs include: mobilization; demobilization; traffic control; normal sheeting, shoring and bracing; excavation and dewatering; standard manholes at typical intervals; typical surface restoration; erosion, sediment and storm water control; overhead; and profit.

In cases where open cut construction is not feasible, unit costs of $20.00 per inch-diameter-foot was used for both Jack & Bore and Microtunneling construction types. The need for these trenchless technologies is identified where necessary in the improvement project costs below.

7.2 Estimated Improvement Costs

The estimated construction costs for the Murchison/Adrian/Aviador Alignment capacity improvements are shown in Table 4. Although the entire project is required before the MSASP flows enter the collection system in order to avoid conveying higher flows through already capacity-limited gravity mains, only a single segment (221020-221021) would not require improvement without the MSASP flows.

Table 4. Murchison/Adrian/Aviador Alignment Gravity Main Capacity Improvements Estimated Construction Cost

Location	Pipe Segment ID	Wet Weather Alternatives Analysis Proposed Diameter, in	MSASP Proposed Diameter, in	Length, ft	Construction Method	Replacement Cost, dollars
Murchison Avenue	224052-224063	12	12	46	Remove & Replace	9,000
Murchison Avenue	224063-221001	12	12	253	Remove & Replace	52,000
Murchison Avenue	221001-221002	12	12	165	Remove & Replace	34,000
Murchison Avenue	221002-221041	12	12	150	Remove & Replace	31,000
Murchison Avenue	221041-221042	12	12	131	Remove & Replace	27,000
Murchison Avenue	221042-221064	12	12	154	Remove & Replace	32,000
Murchison Avenue	221064-221010	12	12	194	Microtunneling	47,000
Murchison Avenue	221010-221011	12	12	253	Remove & Replace	52,000
Murchison Avenue	221011-221025	12	12	92	Remove & Replace	19,000
Adrian Avenue	221020-221021	15	18	257	Remove & Replace	79,000
Aviador Avenue	221021-221026	18	18	51	Remove & Replace	16,000
Aviador Avenue	221026-221023	18	18	235	Remove & Replace	72,000
Aviador Avenue	221023-221024	18	18	137	Remove & Replace	42,000
Aviador Avenue	221024-221030	18	18	58	Jack & Bore	21,000
Aviador Avenue	221030-115065	18	18	216	Jack & Bore	78,000
Aviador Avenue	115065-115064	18	18	290	Remove & Replace	89,000

Table 4. Murchison/Adrian/Aviador Alignment Gravity Main Capacity Improvements Estimated Construction Cost

Location	Pipe Segment ID	Wet Weather Alternatives Analysis Proposed Diameter, in	MSASP Proposed Diameter, in	Length, ft	Construction Method	Replacement Cost, dollars
Aviador Avenue	115064-115063	18	18	244	Remove & Replace	75,000
			Subtotal			775,000
			Contingency	%	30%	233,000
			Construction Subtotal			1,008,000
			Design, Admin., CM, etc.	%	30%	302,000
			Total			$1,310,000

The estimated construction costs for the RDII reduction projects in the Broadway and Hillcrest sub-basins are shown in Table 5. The RDII reduction eliminates the need for both gravity main capacity increases along the Highline Canal alignment and WPCP treatment capacity/equalization in the form of wet weather storage at the WPCP.

Table 5. MSASP Required RDII Reduction Estimated Construction Cost

Sub-basin	Unit	$/Unit	Estimated Rehabilitation and Replacement Quantities and Costs	
			QTY	Total, dollars
Broadway - Sub-basin 1				
Manhole Rehabilitation	EA	5,500	87	479,000
Upper & Lower Lateral Replacement		6,050	312	1,888,000
8-inch Rehabilitation	LF	110	14,674	1,614,000
Hillcrest - Sub-basin 5				
Manhole Rehabilitation	EA	5,500	58	319,000
Upper & Lower Lateral Replacement		6,050	107	647,000
8-inch Rehabilitation	LF	110	9,191	1,011,000
	Subtotal			5,958,000
	Contingency	%	30%	1,787,000
	Construction Subtotal			7,745,000
	Design, Admin., CM, etc.	%	30%	2,324,000
	Total			$10,069,000

8.0 COST ALLOCATIONS

The estimated construction costs for the required improvement/mitigation projects were allocated by ADWF to each of the development areas. Because only the Residential 4, Retail 1, Retail 2, and Office 1 Development Areas are upstream of and contribute to the required gravity main improvement, costs for this improvement were distributed among only these development areas. Because all development areas contribute to the requirement that RDII be reduced so that the PWWF doesn't exceed the WPCP treatment and equalization capacity, the costs for the RDII reduction projects were distributed among all development areas. The cost allocations are presented in Table 6.

Table 6. Estimated Construction Costs Distributed by ADWF Contribution

Development Area	ADWF, gpd	Percentage of ADWF Tributary to Gravity Main Capacity Improvement	Gravity Main Capacity Improvement Cost Distribution, dollars	Percentage of ADWF Contributing to RDII Reduction Requirement	RDII Reduction Cost Distribution, dollars	Total Cost Distribution, dollars
TOD 1	121,153	0%	—	22%	2,181,000	2,181,000
TOD 2	133,254	0%	—	24%	2,399,000	2,399,000
Hotel 1	13,933	0%	—	2%	251,000	251,000
Hotel 2	13,933	0%	—	2%	251,000	251,000
Hotel 3	13,933	0%	—	2%	251,000	251,000
Residential 1	13,345	0%	—	2%	240,000	240,000
Residential 2	9,638	0%	—	2%	173,000	173,000
Residential 3	14,828	0%	—	3%	267,000	267,000
Residential 4	36,328	24%	32,000	6%	654,000	686,000
Retail 1	37,242	24%	32,000	7%	670,000	702,000
Retail 2	37,242	24%	32,000	7%	670,000	702,000
Office 1	42,391	28%	37,000	8%	763,000	800,000
Office 2	72,179	0%	—	13%	1,299,000	1,299,000
Total	559,399	100%	$133,000	100%	$10,069,000	$10,202,000

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Figure 1

Existing Sanitary Sewer Collection System

City of Millbrae
MSASP Sanitary Sewer Collection System and Treatment Capacity Report

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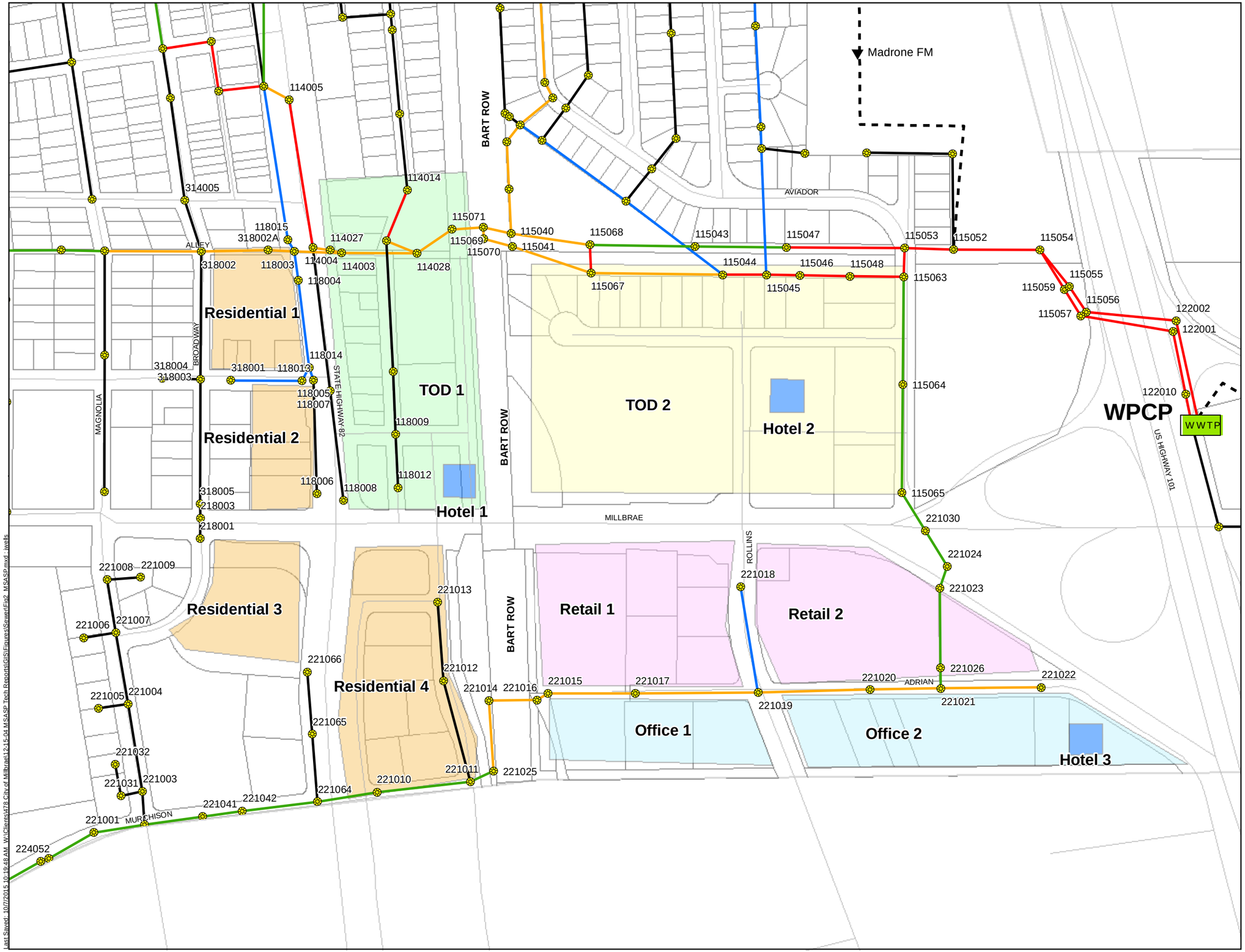

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Figure 2

MSASP Vicinity Sanitary Sewer Collection System

City of Millbrae
MSASP Sanitary Sewer Collection System and Treatment Capacity Report

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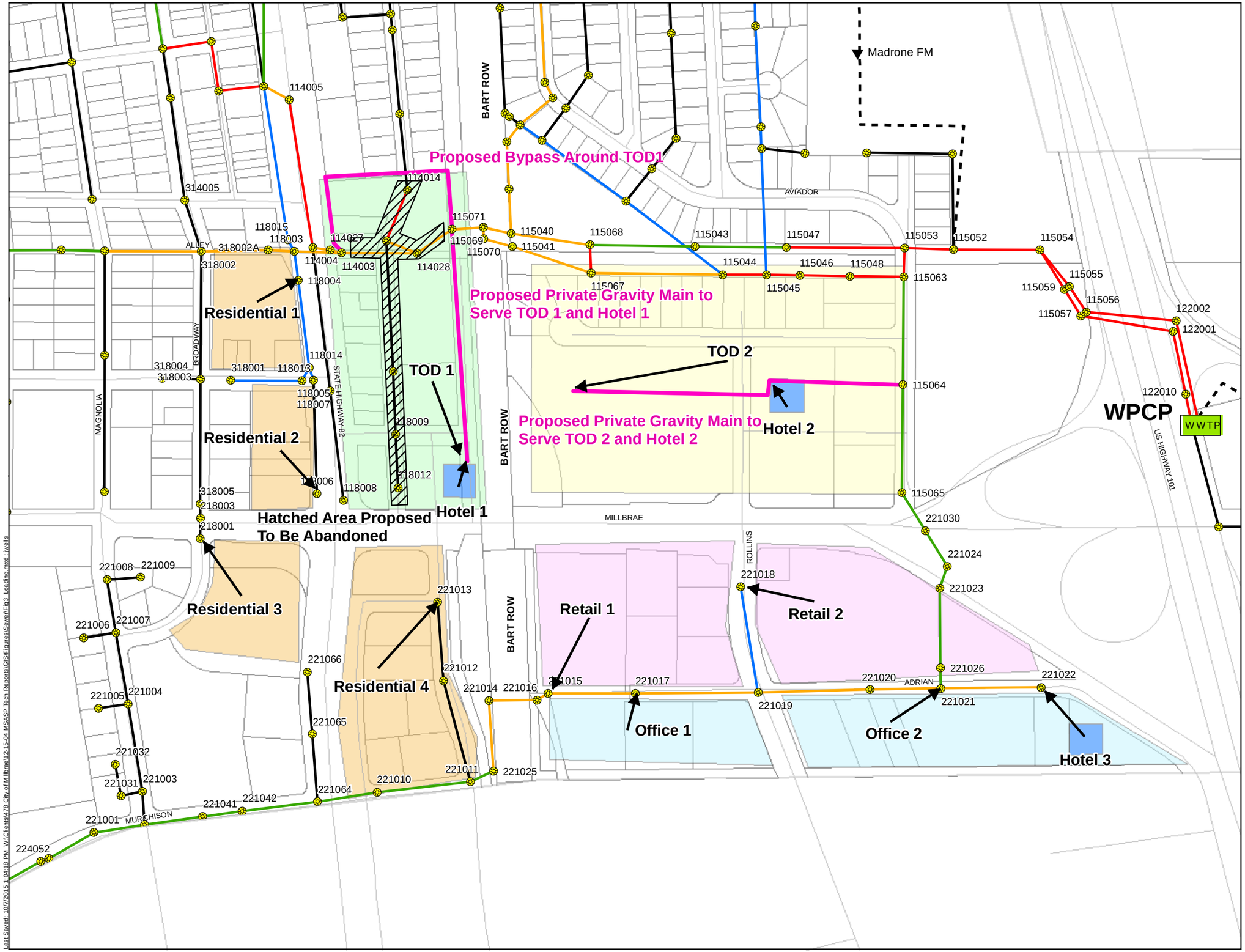

0 200 400

Scale in Feet

Symbology

- Manhole
- Pump Station
- Force Main

Gravity Main Diameter

- 6" or less
- 8"
- 10" - 12"
- 14" - 16"
- 18" - 36"
- Proposed Gravity Main

MSASP Development Areas

- TOD 1
- TOD 2
- Office
- Residential
- Retail
- Hotel
- City Boundary

Figure 3

MSASP Sanitary Sewer Flow Loading Points

City of Millbrae
MSASP Sanitary Sewer Collection System and Treatment Capacity Report

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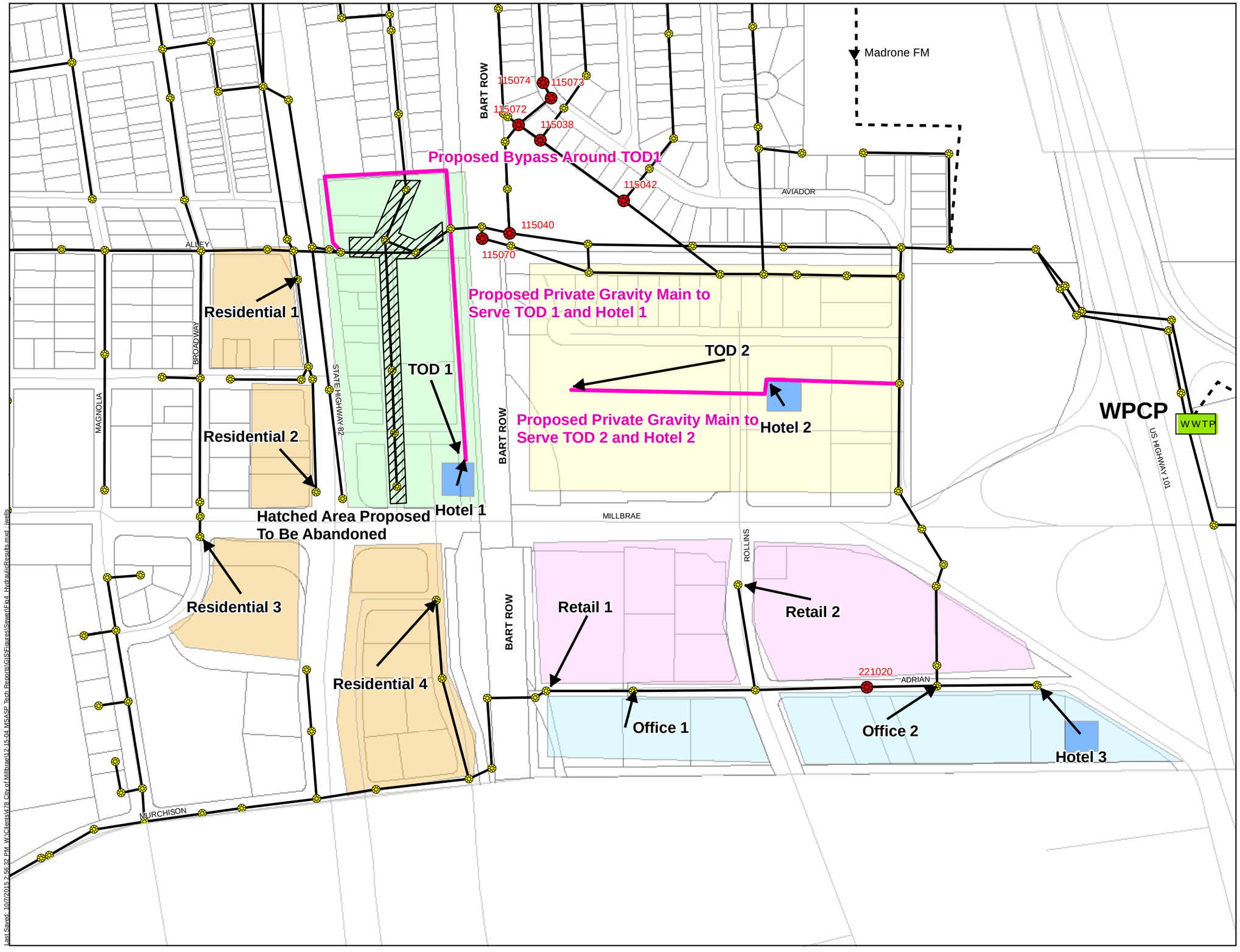

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Figure 4

Hydraulic Results with MSASP Flows Added

City of Millbrae
MSASP Sanitary Sewer Collection System and Treatment Capacity Report

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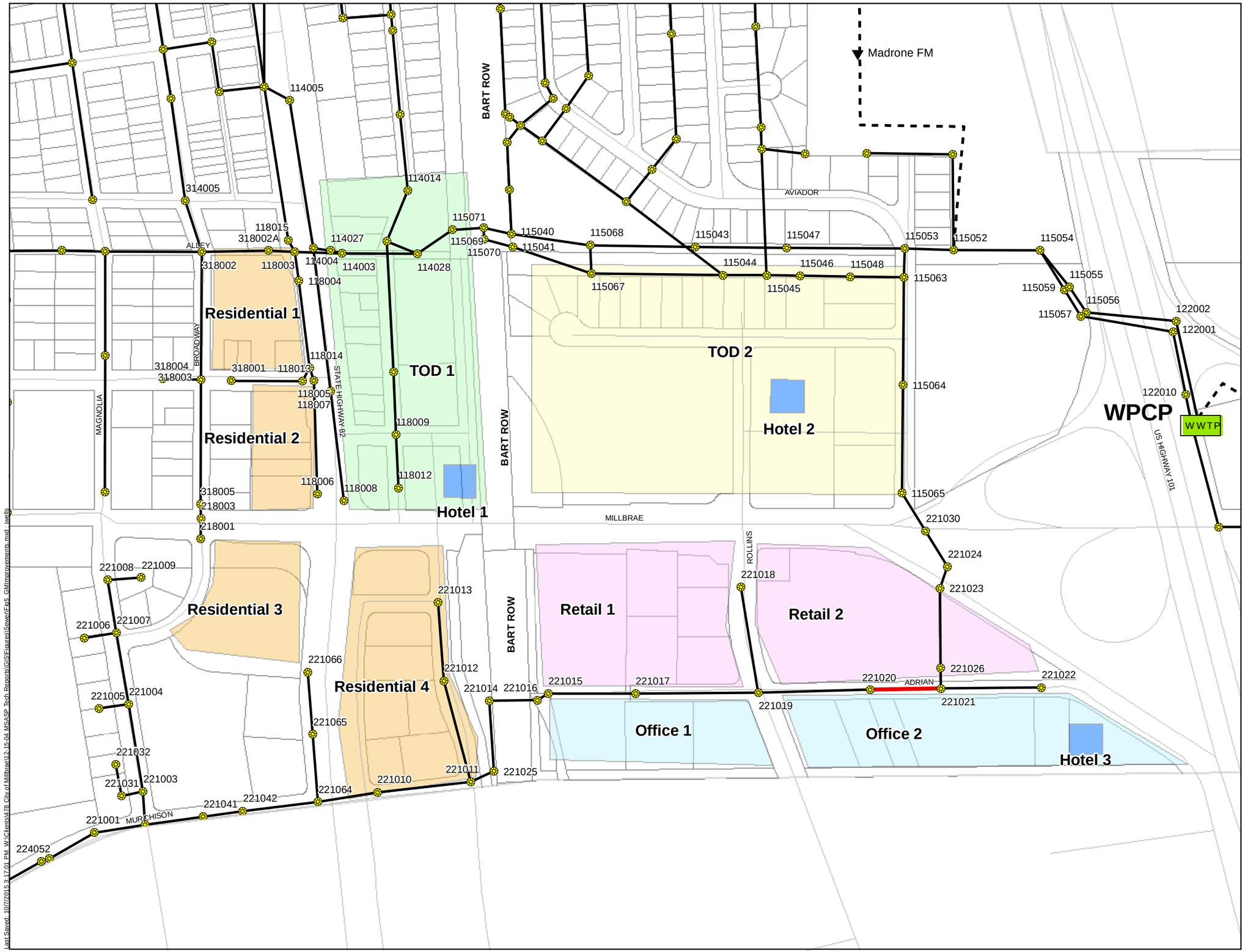

0 200 400

Scale in Feet

Symbology

- Manhole
- Pump Station
- Force Main
- Gravity Main
- Recommended Improvement

MSASP Development Areas

- TOD 1
- TOD 2
- Office
- Residential
- Retail
- Hotel
- City Boundary

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Figure 5

Recommended Gravity Main Improvements

City of Millbrae
MSASP Sanitary Sewer Collection System and Treatment Capacity Report

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0 875 1,750

Scale in Feet

Symbology

- Manhole
- Pump Station
- Force Main
- Gravity Main
- City Boundary
- (#) Subbasin
- Sub-Basin Improvements Required - No MSASP Flows

Figure 6

Sub-Basin RDII Reduction Requirements - No MSASP Flow

City of Millbrae
MSASP Sanitary Sewer Collection System and Treatment Capacity Report

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Table 1
Parks and Recreation Citywide Service Standard and Unit Cost Scenarios
MSASP Parks Development Impact Fee Analysis

Assumptions	Current Recommendation
SERVICE STANDARDS	
Service Population	24,036 serv. pop.
Developed City Parkland	
City Parks	41.8
Within 1/2 Mile Radius of MSASP[1]	26.9
School District Fields/ Playgrounds	22.0
Total Developed Parkland	63.8
Implied Citywide Existing Service Standard(s)	2.65 acres per 1,000 serv. pop. (includes school acres)
	1.12 acres per 1,000 serv. pop. (excludes. school acres and parkland outside of 1/2 mile radius)
Applied Citywide Service Standard	
Residential Development:	2.65 acres per 1,000 serv. pop.
Non-Residential Development:	1.12 acres per 1,000 serv. pop.
UNIT COSTS	
Average Parkland and Development Cost	$3,680,663 per acre
Average Parks Cost per Service Population	
Residential	$9,766 per serv. pop.
Non-Residential	$4,119 per serv. pop.

Table 2
Maximum Fees by Land Use and associated Cost per New Resident/ Service Populatio
MSASP Parks Development Impact Fee Analysis

Assumptions	Current Recommendation
Service Population Assumptions	
Per Multi Family Unit	2.16
Per 1,000 Sq. Ft. Office	0.80
Per 1,000 Sq. Ft. Retail	0.50
Per 1,000 Sq. Ft. Industrial	0.20
Per Hotel Room	0.16

Parks Development Impact Fee Schedule	Maximum Fee	Administrative Fee (2%)
Per Multi Family Unit	$21,094	$21,516
Per 1,000 Sq. Ft. Office	$3,295	$3,361
Per 1,000 Sq. Ft. Retail	$2,060	$2,101
Per 1,000 Sq. Ft. Industrial	$824	$840
Per Hotel Room	$659	$672

Table 3
Comparison of Park Fees for Residential Uses
MSASP Development Impact Fee; EPS #161025

City	Single Family	Multifamily	
		Condominium	Apartment
Belmont	$35,529 per Unit	$26,582 per Unit	$26,582 per Unit
Burlingame	$590 per Unit	$350 per Unit	$350 per Unit
Menlo Park (1)	$48,563 per Unit	$30,563 per Unit	$30,563 per Unit
Millbrae (Recommended)	-	$21,516 per Unit	$21,516 per Unit
Palo Alto Impact Fee (3)	$11,864/ $17,716 per Unit	$3,926/ $7,766 per Unit	$3,926/ $7,766 per Unit
Palo Alto Park In-Lieu Fee (3)	$60,206 per Unit	$41,498 per Unit	-
Redwood City	$12,733 per Unit	$10,689 per Unit	$11,128 per Unit
San Carlos (1)	$43,661 per Unit	$27,064 per Unit	$27,064 per Unit
San Mateo	$19,105 per Unit	$13,822 per Unit	$13,822 per Unit

(1) Fees will vary by project. Current estimates reflect prior charges or other available information.
(2) Includes a 2 percent administrative fee.
(3) Park in-lieu fee is required for subdivisions with more than 50 parcels. When parkland dedication applies, park impact fees do not apply. Park impact fees apply to residential projects that do not require a subdivision map or or for projects that have a subdivision or parcel map of less than 50 parcels. Park impact fees for single family and multifamily vary depending on the size of the unit.

Sources: City of Belmont, Burlingame, Menlo Park, Millbrae, Palo Alto, Redwood City, San Carlos, San Mateo, and EPS