CITY OF MARTINEZ

DOWNTOWN INFRASTRUCTURE PLANNING AND DESIGN STUDY

Prepared by:

DYETT & BHATIA
Urban and Regional Planners

BKF Engineers/Surveyors/Planners

Advanced Energy Strategies, Inc.

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Executive Summary

This study aims to help the City of Martinez overcome identified barriers to implementation of its Downtown Specific Plan (Specific Plan), adopted in 2006. Specifically, this study evaluates the infrastructure requirements for achieving a revitalized Downtown with dense residential, mixed use, and commercial development, as outlined in the Specific Plan. Property owners have indicated that the infrastructure serving Downtown may be insufficient, and in some cases individual property owners have experienced high costs to upgrade the existing infrastructure to accommodate new businesses in the Downtown area. Addressing this possible disincentive to develop in Downtown – in contrast to areas with newer infrastructure – is a key objective of this study.

The key to understanding how to address the issue of infrastructure in the Downtown area is to:

1. Identify required improvements to support development proposed in the Downtown Specific Plan (Chapter 1).
2. Develop a detailed list of specific upgrades that may be needed and costs of those upgrades (Chapter 2).
3. Determine what methods and options for funding and financing the identified upgrades exist, and how these methods could be implemented to best encourage the market for downtown development (Chapter 3).
4. Identify additional approaches related to sustainable development that could further reduce demand (Chapter 4).

This study addresses each of these issues; study finding are summarized below.

Infrastructure Demand, Capacity, and Adequacy

Natural Gas and Electric

The study finds that sufficient capacity exists for both electricity and natural gas delivery to satisfy existing and projected future demands under the Specific Plan. There is no reason to expect the existing electric and natural gas delivery systems would impede development.

Sanitary Sewer

The study finds that the Alhambra Avenue trunk line will have an impact to the downstream sewer lines with the future development of the Specific Plan. If plans to improve the pipe capacity of this line are not completed prior to the development of the downtown area, approximately 1,526 linear feet of sewer line on Alhambra Avenue in the downtown area will have pipe capacity issues. In addition, Main Street will continue to have pipe capacity issues unless the Alhambra Avenue trunk

line is improved. Finally, while Foster Street doesn't currently have pipe capacity issues, if the proposed 272 unit multi-family development is completed as proposed, the Foster Street sewer line would need to be upsized to accommodate the additional flow.

Infrastructure Improvements and Costs

Natural Gas and Electric

Because there are no facility upgrades that are required either now or in the foreseeable future, there are no major challenges to upgrading the gas and electric infrastructure that would accompany the Downtown Martinez Specific Plan. However, site specific costs may exist. PG&E has a set of rules that guide the service application process that include provisions for construction and cost allocation between the applicant and PG&E, related to distribution line extensions (Rules 15) and service extensions (Rule 16). The only other cost ramification would be a result of the City requirement that all new electric distribution lines be undergrounded at the developer's expense.

Sanitary Sewer

Sewer lines in Alhambra Avenue between Escobar Street and Susana Street and the sewer line on Main Street can avoid upsizing if the Alhambra Avenue trunk line is upsized as recommended in the CCCSD master plan report. The sewer line on Foster Street can avoid upsizing if sewer flow from the proposed 272 multi-family unit can be diverted to the 27" sewer line in Berrellesa Street. However, if these improvements are required, estimated costs for sewer upgrades are:

- Main Street between Berrellesa Street and Alhambra Avenue: $43,300
- Foster Street between Richardson and Berrellesa streets: $59,500
- Alhambra Avenue between Escobar and Susana streets: $316,400

Funding Sources and Financing

Natural Gas and Electric

No major funding requirements are identified since the study finds little need to upgrade gas and electric delivery systems beyond what PG&E has and is expected to continue to do. In terms of site specific costs, Rule 16 rebates provide a significant source of funding for obtaining new electric and gas service. Since the majority of the proposed development would be dense residential development, Rule 16 rebates are expected to at least cover connection (Rule 16 costs), and perhaps contribute to other undergrounding requirements as they might develop.

If additional utility undergrounding were identified, Rule 20A would be the first source of funding. However, if the undergrounding project is too small or motivated by other than the City, it will not qualify for Rule 20A, and must be done through Rule 20B or Rule 20C. Either of these paths will require the developer to pay most or all of the undergrounding costs. The City may make an exception to the undergrounding requirement, however, on a case-by-case basis. Most areas in the Planning are already undergrounded, or are planned for undergrounding.

Sanitary Sewer

The City and CCCSD would need to facilitate infrastructure improvements required by developers in two circumstances to implement the Downtown Specific Plan:

1. To promote development that would impact the Alhambra Avenue Trunk line in advance of the Alhambra Avenue Trunks expansion (planned for 2017), thereby requiring improvements on Main Street or Alhambra Avenue between Escobar and Susana streets; or

2. To promote development on opportunity site 3, if development requires use of sewer infrastructure on Foster Street.

It may be appropriate for the developer to bear the initial costs; however, because the resulting infrastructure would ultimately serve as improved infrastructure for the City, a reimbursement program is also recommended. This would reduce the cost and risk to the developer and help promote development in the Downtown area. In order to reimburse the developer, the City may use developer impact fees, tax increment financing, or the establishment of an assessment district. Alternatively, the City may fund the improvements following the establishment of an assessment district, infrastructure financing district, or redevelopment area.

Technology and Sustainability Review

Natural Gas and Electric

Sustainability of energy use may take three forms: efficiency of usage; conservation of usage; and on-site production of renewable energy or that takes advantage of combined heat and power. Both efficiency and conservation of usage may be passive or active. The most likely on-site production option would be use of solar technology.

Sanitary Sewer

Reducing sewer demands would be beneficial to relieving pipe capacity issues that currently exist within portions of the sewer infrastructure, however would not eliminate the need for upgrades. Two different design practices to reduce sanitary sewer demands for the development of the downtown area include water conservation measures, such as water conserving or waterless plumbing fixtures; and/or wastewater treatment on-site for reuse for non-potable water demands such as irrigation and toilet flushing.

1 Infrastructure Demand, Capacity and Adequacy

1.1 Downtown Specific Plan Proposed Development

The Downtown Specific Plan proposes new high density development focused in the Downtown core. Buildout numbers for the Downtown area are based on opportunity sites, as developed for the Downtown Specific Plan Environmental Impact Report and updated based on approved and completed projects. For the purposes of this report, new development potential is the focus. While net development in the area may result in less commercial/retail space overall, there remains a demand for over 23,000 square feet of new commercial/ retail space in the study area that would require adequate infrastructure. New and net potential development is shown in Table 1-1.

Table 1-1: Downtown Martinez Specific Plan Potential Development Scenario Summary

Land Use	***New Potential Development***	*Net Potential Development*
Single Family Residential	25 units	25 units
Townhomes	72 units	72 units
Multi-Family Residential	683 units	683 units
Residential Total	**780 units**	**780 units**
Commercial/ Retail	23,400	-35,100 square feet
Office	42,100	27,000 square feet
Industrial	0	-105,700 square feet
Non-Residential Total	**65,500 square feet**	**-113, 800 square feet**

All of the potential commercial/retail uses occur in the Downtown Core area, primarily near Green Street and Marina Vista. Similarly, most of the office uses occur in the Downtown Core, with the exception of some office live/work in the Downtown Shoreline area. Residential uses are located throughout the study area, with all single family uses occurring in the Grandview neighborhood.

New development by opportunity site, Specific Plan district, current use, and potential future use are shown in Tables 1-2 and 1-3. Numbered opportunity sites are shown in Figure 1-1.

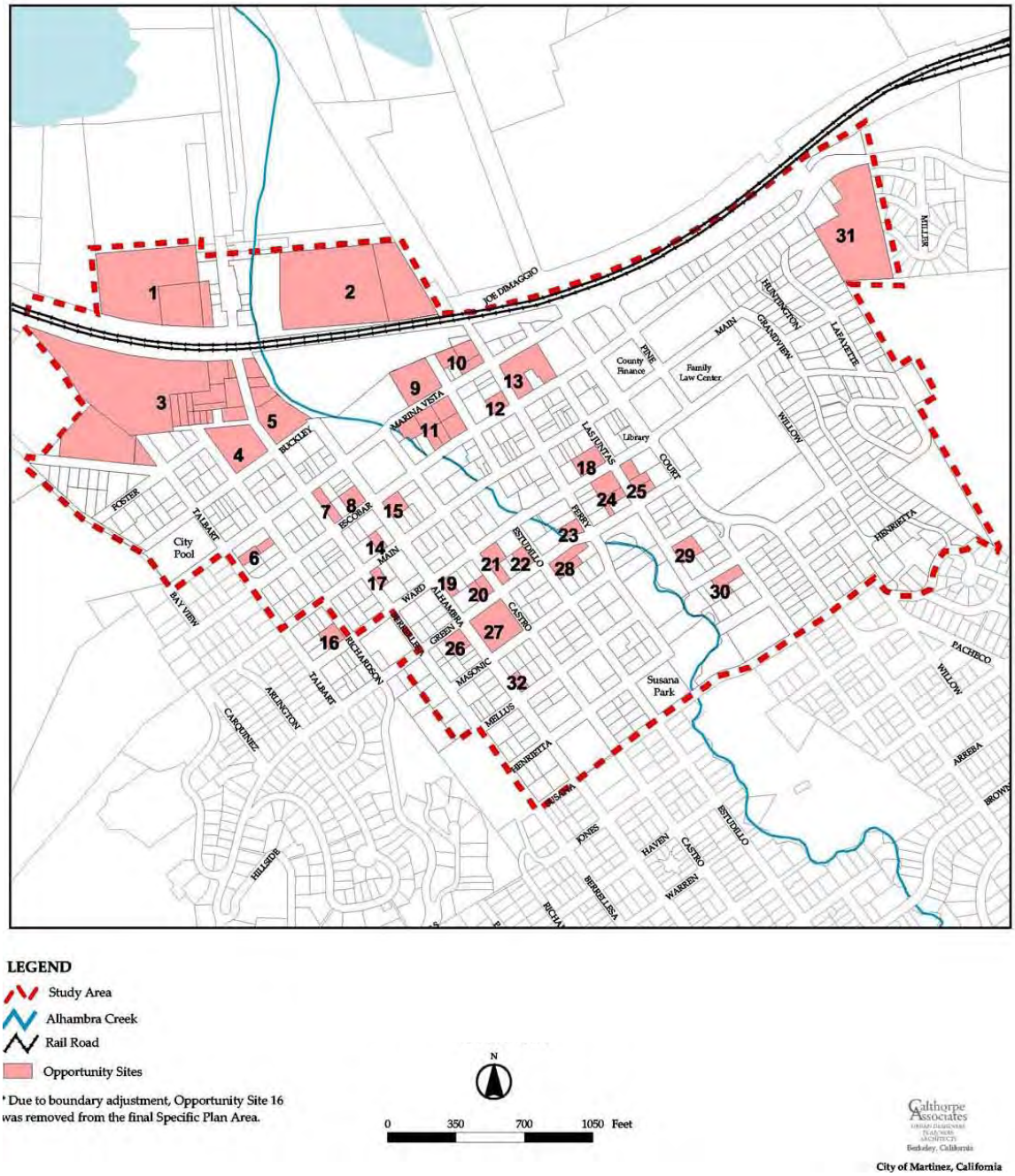
Table 1-2: Downtown Martinez Specific Plan Potential Residential Development Scenario Detail				
Residential Uses				
Site	*Sub-district*	*Current Use*	*Units*	*Future Use*
3	Downtown Shoreline	Industrial	272	Multi-family
4	Downtown Shoreline	Industrial	49	Multi-Family
8	Downtown Neighborhood	Vacant	9	Multi-family
28	Downtown Neighborhood	Vacant	12	Multi-Family
32	Downtown Neighborhood	Vacant	4	Multi-family
9	Downtown Core	Commercial	64	Multi-family
10	Downtown Core	Commercial	35	Multi-family
12	Downtown Core	Commercial	9	Multi-family
13	Downtown Core	Parking Lot	40	Multi-family
14	Downtown Core	Vacant	14	Multi-family
17	Downtown Core	Vacant	4	Multi-family
19	Downtown Core	Parking Lot	4	Multi-family
26	Downtown Core	Vacant	9	Multi-family
27	Downtown Core	Commercial	83	Multi-family
misc	Downtown Core	misc	75	Multi-family
			683	**Multi-family Subtotal**
3	Downtown Shoreline	Industrial	24	Townhomes
6	Downtown Neighborhood	Vacant	7	Townhomes
7	Downtown Neighborhood	Commercial	7	Townhomes
29	Downtown Neighborhood	Office	6	Townhomes
30	Downtown Neighborhood	Office	5	Townhomes
15	Downtown Core	Commercial	5	Townhomes
20	Downtown Core	Medical Office	5	Townhomes
21	Downtown Core	Office	9	Townhomes
22	Downtown Core	Medical Office	4	Townhomes
			72	**Townhomes Subtotal**
31	Grandview	Vacant	25	Single Family
		TOTAL	**780**	**Residential Units**

Notes: Sites 1 and 2 are part of the North Shoreline District, which was not officially adopted in full, and so are not included here. The District is reserved for possible future action and/or amendment.
Site 4 has been approved for 49 multi-family units (2009).
Site 6 has been approved for 7 townhomes (2007).
Site 16 is outside the final Downtown Specific Plan area boundary, so not included here.
Site 28 has been approved for 12 multi-family units (2005).

Table 1-3: Downtown Martinez Specific Plan Potential Non-Residential Development Scenario Detail				
Non-Residential Uses				
Site #	*Sub-district*	*Current Use*	*Square Feet*	*Future Use*
11	Downtown Core	Industrial	9,900	Commercial
18	Downtown Core	Commercial	6,000	Commercial
24	Downtown Core	Industrial	7,500	Commercial
			23,400	**Commercial Subtotal**
9	Downtown Core	Commercial	2,600	Office
18	Downtown Core	Commercial	6,000	Office
24	Downtown Core	Industrial	7,500	Office
5	Downtown Shoreline	Industrial	26,000	Office (live/work)
			42,100	**Office Subtotal**
		TOTAL	**65,500**	**Non-Residential Subtotal**

Note: Site 25 was developed as the new County District Attorney Office Building, no longer available for redevelopment.

Figure 1-1: Downtown Martinez Specific Plan Opportunity Sites



LEGEND

- Study Area
- Alhambra Creek
- Rail Road
- Opportunity Sites

* Due to boundary adjustment, Opportunity Site 16 was removed from the final Specific Plan Area.

N

0 350 700 1050 Feet

Calthorpe Associates
Berkeley, California

City of Martinez, California

Source: Figure C-1: Opportunity Sites, Downtown Specific Plan, City of Martinez, Adopted July 24, 2006

1.2 Natural Gas and Electric Demand, Capacity and Infrastructure Adequacy

A review of the existing gas and electric utility infrastructure was conducted, and is summarized in this section. Figures 1-2 and 1-3 show the existing gas and electric infrastructure, respectively.

SUMMARY OF FINDINGS

The primary findings of this section are that, after reviewing the status of the electric and natural gas distribution systems serving the priority development project area, there is no reason to expect the existing electric and natural gas delivery systems to impede development. Sufficient capacity exists for both electricity and natural gas delivery to satisfy existing and projected future demands under the Downtown Martinez Specific Plan reviewed.

BASIS OF OUR FINDINGS

Our findings are predicated on three factors: (1) the change in both electric and natural gas load due to the proposed future development is small relative to existing area load and should not represent a significant impact on delivery infrastructure to accommodate development; (2) the fact that the existing delivery systems for both natural gas and electricity are sufficient to meet existing project area requirements, and (3) from a forward-looking perspective, even when load does increase, PG&E has a utility obligation to invest in its delivery systems in order to provide adequate service. Each factor is discussed in detail below.

General Description of the Electric and Natural Gas Infrastructure

Electric Distribution System

The electric distribution system serving the project area is composed of two delivery voltage subsystems: a 12,000 volt (12 KV) sub-system and a 21,000 volt (21 KV) sub-system. The evaluation team was provided a map of electric system serving the project area by PG&E, but the map did not trace individual distribution lines back to their points of origin (substations). Thus, we know there is at least one of each the 12 KV and 21 KV lines, and there might be additional lines (representing additional delivery capacity). Even if there is only one of each voltage, the distribution potential for the area it serves is over 25,000 KW of peak load. The electric system has been upgraded through undergrounding projects in the priority development area. Undergrounding would typically include use of higher capacity conductors and inclusion of spare conduits to accommodate future load growth. Both factors support the idea that the existing system is in good shape to support existing load and future load growth.

Figure 1-2 Existing Electrical Distribution

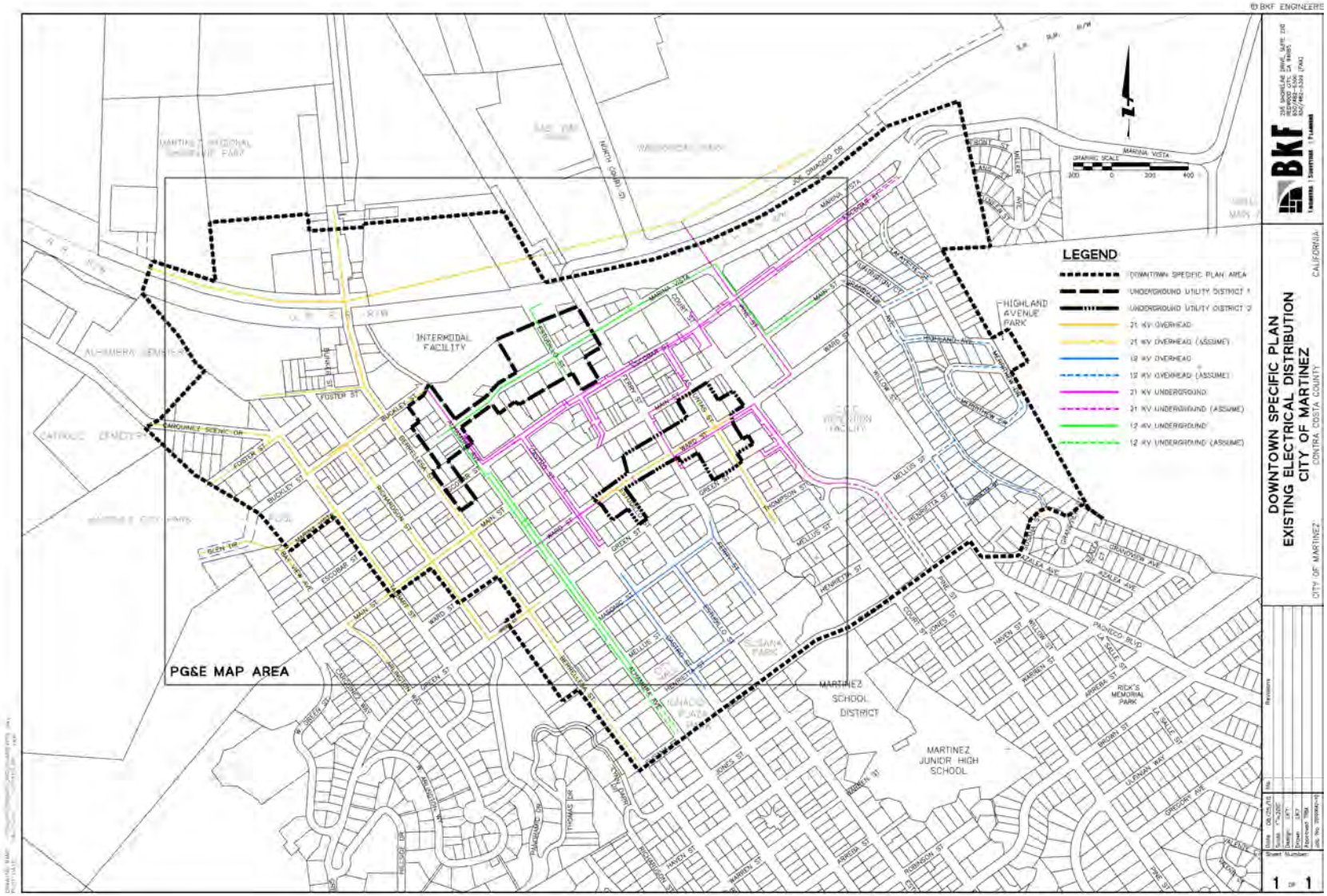
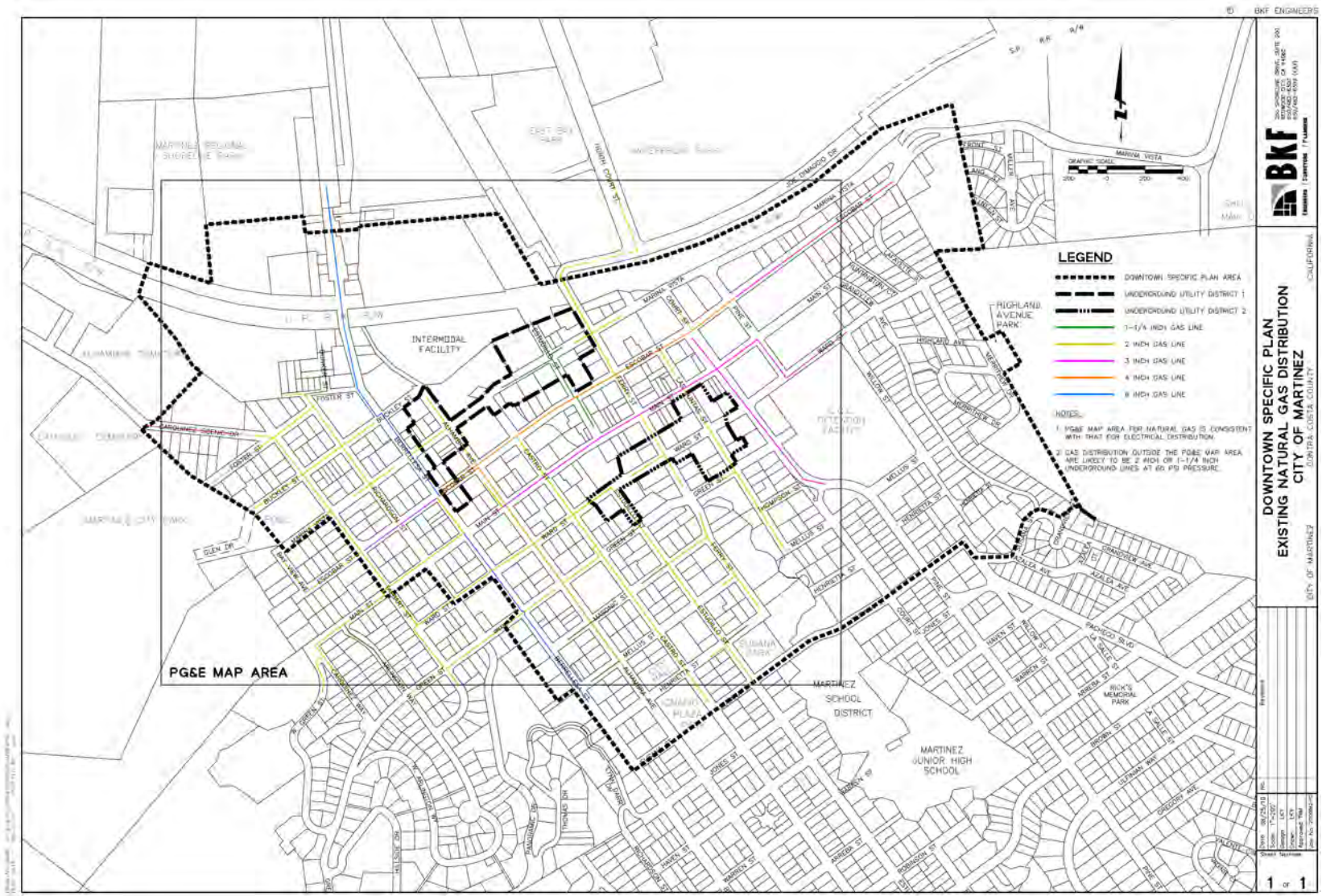


Figure 1-3: Existing Natural Gas Distribution



Natural Gas Distribution System

The natural gas distribution system serving the project area is comprised of trunk and radial gas lines that vary in size from 6 inches to one-half inch. A map of gas service to the project area was provided by PG&E indicating the mix of delivery lines throughout the project area. The map did not include specification of gas regulator locations, but did indicate a nominal pressure for the larger lines (6 inch and 4 inch) of over 50 pounds psig. An accurate calculation of delivery capability for the gas system is beyond the scope of this assessment (and not possible with the limited information we have). Nevertheless, this amount of piping and pressure should be able to provide the delivery system with ample capacity for demand growth.[1]

Analytical Approach

This analysis uses two concepts that are important to note. First, changes in the use of electricity and natural gas that arise from the Downtown Martinez Specific Plan are measured as changes in "peak" demand. Peak demand is the estimated maximum amount of demand that is forecast at any time during an annual period, and is therefore an amount that puts the most strain on the respective delivery systems. The design concept is that once the delivery system meets peak demand requirements, it can accommodate all delivery needs in the area. The second concept used in this analysis is an "incremental" impact approach. The incremental approach measures changes that are forecast based on the specific project sites that will be affected, and not on the overall gas and electric delivery systems. The concept is that, as long as the incremental impacts are within usual demand guidelines, they will be unlikely to cause significant stress on the respective delivery system, and therefore the utility infrastructure will not likely impede future development objectives.

Impact on Demand Due to Future Development

The most significant finding of this study is that predicted load changes resulting from future development are not dramatic: for electricity, the change is projected to be less than 500 KW, or under 10 percent of existing peak load of redeveloped sites. For natural gas, the projected change is just of 1,000 cubic feet per hour, or about 23 percent of projected peak load of existing development sites. These results are presented in Tables 1-4 and 1-5. Both tables look at changes in peak load as an "incremental" impact of the development program, comparing load impacts on only identified sites within the project area.[2] The impact on electricity load is presented in Table 1-4. As shown, Land Use is divided between Non-Residential and Residential uses. Each has sub-categories as shown. The future development projects are largely focused on transitioning land use from multiple non-residential land uses to residential, and thereby eliminating a significant portion of industrial usage. Considering electric load that will be developed into residential use, there is no (zero) existing residential load; i.e. there are no plans to develop existing residential properties. However, there is a significant gain of 2,844 KW upon full build-out of project sites that are being converted to residential from non-residential uses. Meanwhile, for non-residential land uses, we see the existing estimated load of 2,892 KW is projected to plummet to only 351 KW. This reflects the transi-

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[1] Very cursory estimates support a delivery capability in excess of 100,000 cubic feet per hour.

[2] The methodology used to compute respective loads is described in Sections 2 and 3 below.

tion from non-residential land use to residential land use under future development. Just over 12 percent of non-residential load remains as non-residential after build-out.

Table 1-4: Net Electric Load Assessment

Land Use	*Existing Demand (KW)*	*Developed Demand (KW)*	*Increase / (Decrease)*
Residential			
Single-Family	-	188	188
Multi-Family	-	2,305	2,305
Townhouses	-	351	351
Total Residential	**-**	**2,844**	**2,844**
Non-Residential			
Commercial	929	140	(788)
Industrial	1,420	-	(1,420)
Medical Office	37	-	(37)
Misc	332	-	(332)
Office	174	211	36
Parking Lot	-	-	-
Vacant	-	-	-
Total Non-Residential	**2,892**	**351**	**(2,541)**
Total Electric	**2,892**	**3,195**	**302**
			10.4%

Overall, Table 1-4 reflects the full estimated impact of the future development projects: electric load is estimated to increase from its current level of 2,892 KW to 3,195 KW, or by just over 10 percent. This increase is only 302 KW, or less than one-half of a megawatt. Measured as an impact on the electric distribution system, it is less than two percent of the single 12 KV and 21 KV lines combined that serve the priority development area. This is well within typical planning ranges for electric distribution system design.

It is important to note that these estimates are based on estimated relationships between square footage, usage loading, and project results. No meter data were available, and no other aggregated data were made available by PG&E. Nevertheless, the results point to the important observation that, since future development leads to a minimal increase in projected load, it is very unlikely to cause a stress on the existing or evolving electric distribution system.

Table 1-5: Net Natural Gas Peak Load Assessment			
Land Use	*Existing Demand (cf/hr)*	*Developed Demand (cf/hr)*	*Increase / (Decrease)*
Residential			
Single-Family	-	311	311
Multi-Family	-	3,915	3,915
Townhouses	-	596	596
Total Residential	**-**	**4,823**	**4,823**
Non-Residential			
Commercial	1,647	332	(1,315)
Industrial	2,014	-	(2,014)
Medical Office	65	-	(65)
Misc	589	-	(589)
Office	362	597	235
Parking Lot	-	-	-
Vacant	-	-	-
Total Non-Residential	**4,678**	**929**	**(3,749)**
Total Gas Consumption	**4,678**	**5,752**	**1,074**
			23.0%

The impact of planned development on peak demand for natural gas is similar, and is presented in Table 1-5. Gas demand is represented as the estimated peak flow, measured in cubic feet per hour. As shown in Table 1-5, the shifts in land use create an increase of estimated gas usage during peak flow. In the non-residential land use areas, we see peak demand declining from 4,678 cubic feet per hour to 929 cubic feet per hour, for almost an 80 percent decrease in peak load. This is offset by an increase in the residential land use areas, where peak load is estimated to increase by an even greater amount, going from zero to 4,823 cubic feet per hour. Overall, the demand on the natural gas delivery system is seen to increase, from 4,678 cubic feet per hour to 5,752, for an estimated increase of 23 percent.

The increase of 23 percent represents a more significant growth in peak demand for natural gas than for electricity. This is largely due to the shift from less intense uses under non-residential land uses than under residential gas usage. Although this analysis does not provide an estimate of actual natural gas delivery capabilities of the existing system, the overall estimated increase of 1,074 cubic feet per hour due to future development is a small fraction of probable distribution capabilities.[3] As with the electric distribution system, we see little concern that the future development projects will be negatively affected by the natural gas delivery infrastructure.

[3] For example, if the existing system is capable of delivering 100,000 cf/h, there would be only a one-percent increase in use of existing capacity.

Tables 1-4 and 1-5 reflect the similar impact of the future development projects on the project area for natural gas and electricity: an estimated change in loads that are within the planning capacities of the gas and electric delivery systems. These changes in demands, between projected existing and future development uses, are "dampened" compared to the change in developed space created through development. This can be seen on Table 1-6.[4] Here we see the amount of developed space under the proposed Downtown Martinez Specific Plan is 773,800, compared to the existing development of 329,808. This represents an increase of almost 75 percent. Yet, as shown in Tables 1-4 and 1-5, changes in electric and gas demand are not nearly as significant. This is due to two effects: First, the Downtown Martinez Specific Plan creates a shift in land use from a more energy-intensive mix of industrial, commercial and offices to that of residential. And second, as the new residential units are developed, the implementation of better design standards such as those under Title 24 further reduce projected energy usage. The end result is that, as a pure matter of energy demand, we project minor impacts on the delivery infrastructure that are within normal utility planning standards. Therefore, we see no reason to expect the electric and natural gas system to impede the future development effort.

Table 1-6: Comparison of Existing vs. Developed Space

	Existing Buildout (sf)	*Developed Buildout (sf)*
Non-Residential to Residential *(Table 2B)*	150,508	708,300
Non-Residential to Residential *(Table 3B)*	179,300	65,500
	329,808	**773,800**
Net Increase	**443,992**	
	174%	

There are a few caveats to these findings. First, this analysis is based on estimated loads, derived using typical utility planning assumptions. No metered data were provided by PG&E and such data could differ from our estimates and affect the results. Second, this assessment is provided at the "macro" level of estimated total impact. Impacts on individual developers of specific project sites could be adversely affected by both PG&E's tariffs (specifically, Rule 16) and by the City of Martinez' code requirements to underground electric systems that currently are not. These will be addressed in future project memorandums.

PG&E Existing Service

The second reason that we expect minimal impact of natural gas and electric delivery system infrastructure on future development efforts is that, the existing systems are currently serving the load in place. There is no evidence that the existing system is or has been inadequate for delivering electric and natural gas service, and can see no reason for such into the future.

[4] The data for Table 1-C is taken from other tables constructed for this memo as indicated.

PG&E Obligation to Serve

The third reason we expect that existing electric and natural gas delivery infrastructure will remain adequate into the future and will not impede development efforts lies in PG&E's ongoing obligation to provide service as the sole franchised utility provider. As the franchised provider, PG&E is tasked with providing service now and into the future. That means it is responsible to plan for changes in load growth for both services. We believe there is adequate evidence that PG&E is fulfilling this role. One example of this is in PG&E's work with the City in the undergrounding of electric delivery facilities (and replacement of the overhead system). Together, the City and PG&E have identified and completed four undergrounding projects and are currently working on a fifth, the Marina Vista upgrade project. Furthermore, the City has identified a future undergrounding project within the priority development area.

As part of designing and building undergrounded infrastructure projects, two significant impacts are evident: first, modern materials and designs are implemented; and second, the design includes "spare" underground conduits that can be used to accommodate future load growth. Overall, the rebuilding efforts are in fact system upgrades that enhance delivery systems' capabilities to meet utility requirements that will support the development effort. Taken all together, these undergrounding projects either already have or will provide for the significant rebuilding of the electric infrastructure that serves the non-residential load sections of the project area where the development sites are located.

METHODOLOGY OF THE ASSESSMENT

This analysis was based on the goals and objectives of the future development projects, measured by estimating the effects of development efforts to the site level, and estimating changes in peak demand for electric and natural gas that resulted from those changes. This was accomplished through a series of forecasted impacts, that when put together, lead to estimates of changes to load as reported above.

Caveat regarding PG&E Information

As originally envisioned, this analysis anticipated availability of electric and natural gas load data from either the City or PG&E. Such data were ultimately not available. The approach that is described below was designed to estimate the non-available data by estimating existing and future electric and natural gas loads, based on typical estimation parameters and best professional judgment. It is important to note that this analysis is for comparative load estimates only and is in no way adequate for system design, system stability, or other typical utility load analysis or management efforts. The load forecasts do provide adequate representation of the electric and natural gas systems' general ability to either support or impede the future development effort envisioned in the future development projects.

Load Forecast

Land Transitioned from Non-Residential to Residential Use

As described above, forecasts of electric and natural gas loads are based on an incremental approach. It is also a "bottom up" approach, based on looking at the specific development parcels,

how each parcel is currently used (its "land use"), and how it will be used once developed. As noted above, the tendency of the future development projects is to transition land use from industrial, commercial and office space to a smaller mix of commercial and office space, and a significantly greater use of mixed residential. This is evident in Table 1-7, which lists the land use transition from various non-residential uses to residential uses. Three residential uses are identified: multi-family, townhomes and single-family homes. The table lists specific sites, and for each site, the land use that currently exists and the number of residential units that are planned to be built upon build-out. For example, Site 3 is slated to be used to develop 272 multi-family residential units, but it is currently being used for industrial purposes. All sites within the future development projects that will transition from non-residential use to residential use are captured in Table 1-7.

Table 1-7: Land Use Transition to Residential and Development Demands

					Development	
Site	*Sub-district*	*Current Use*	*Developed Units*	*Sq Ft per Unit*	*Peak Electric Demand (KW)*	*Peak Gas Demand (cf/hr)*
Multi-Family						
3	Downtown Shoreline	Industrial	272	900	918	1,559.2
4	Downtown Shoreline	Industrial	49	900	165	280.9
8	Downtown Neighborhood	Vacant	9	900	30	51.6
28	Downtown Neighborhood	Vacant	12	900	41	68.8
32	Downtown Neighborhood	Vacant	4	900	14	22.9
9	Downtown Core	Commercial	64	900	216	366.9
10	Downtown Core	Commercial	35	900	118	200.6
12	Downtown Core	Commercial	9	900	30	51.6
13	Downtown Core	Parking Lot	40	900	135	229.3
14	Downtown Core	Vacant	14	900	47	80.3
17	Downtown Core	Vacant	4	900	14	22.9
19	Downtown Core	Parking Lot	4	900	14	22.9
26	Downtown Core	Vacant	9	900	30	51.6
27	Downtown Core	Commercial	83	900	280	475.8
misc	Downtown Core	Misc	75	900	253	429.9
			683		**2,305**	**3,915.2**
Townhomes						
3	Downtown Shoreline	Industrial	24	1,300	117	198.7
6	Downtown Neighborhood	Vacant	7	1,300	34	58.0
7	Downtown Neighborhood	Commercial	7	1,300	34	58.0
29	Downtown Neighborhood	Office	6	1,300	29	49.7
30	Downtown Neighborhood	Office	5	1,300	24	41.4
15	Downtown Core	Commercial	5	1,300	24	41.4

Table 1-7: Land Use Transition to Residential and Development Demands						
					Development	
Site	*Sub-district*	*Current Use*	*Developed Units*	*Sq Ft per Unit*	*Peak Electric Demand (KW)*	*Peak Gas Demand (cf/hr)*
20	Downtown Core	Medical Office	5	1,300	24	41.4
21	Downtown Core	Office	9	1,300	44	74.5
22	Downtown Core	Medical Office	4	1,300	20	33.1
			72		**351**	**596.2**
Single Family						
31	Grandview	Vacant	25	2,200	188	311.4
		Totals	**780**		**2,844**	**4,823**

Note: Electric estimates were base on a peak load use of 3.75 watts per square foot of multi-family use; 3.75 watts per square foot of Townhomes, and 4.5 watts per square foot of single family use. Gas demand was based on an average use of 491 therms per year for a single family residence, factored by square footage for multi-family and townhomes, and divided by 40 percent to estimate peak demand.

Electric and gas loads resulting from future development are estimated on Table 1-7. Loads are considered to be a function of the amount of square feet that will be developed. This analysis assumes that multi-family units will average 900 square feet, townhomes will average 1,300 square feet, and single-family homes will average 2,200 square feet. These assumptions are on the "high" side of size; this builds in a conservative slant to the analysis: by using high load forecasts, the resulting requirements on electric and natural gas delivery systems will be conservatively high for assessing stress created by new development. The load forecasts derived in Table 1-7 are totaled in respective sub-categories of residential electric and natural gas demand, and are used in the analysis presented in Table 1-4 and 1-5 above.

Table 1-8: Estimate of Existing Land Use						
Site	*Sub-district*	*Current Use*	*Units*	*Unit SQ FT*	*Developed SF Area*	*Existing Building SF Area*
3	Downtown Shoreline	Industrial	272	900	244,800	16,970
4	Downtown Shoreline	Industrial	49	900	44,100	477
8	Downtown Neighborhood	Vacant	9	900	8,100	-
28	Downtown Neighborhood	Vacant	12	900	10,800	-
32	Downtown Neighborhood	Industrial	4	900	3,600	897
9	Downtown Core	Commercial	64	900	57,600	11,723
10	Downtown Core	Commercial	35	900	31,500	5,753
12	Downtown Core	Commercial	9	900	8,100	3,343
13	Downtown Core	Parking Lot	40	900	36,000	-
14	Downtown Core	Vacant	14	900	12,600	-
17	Downtown Core	Vacant	4	900	3,600	-
19	Downtown Core	Parking Lot	4	900	3,600	-
26	Downtown Core	Industrial	9	900	8,100	1,009
27	Downtown Core	Commercial	83	900	74,700	26,550
misc	Downtown Core	Misc	75	900	67,500	41,538
			683		**614,700**	**108,260**
3	Downtown Shoreline	Industrial	24	1,300	31,200	16,970
6	Downtown Neighborhood	Vacant	7	1,300	9,100	-
7	Downtown Neighborhood	Commercial	7	1,300	9,100	3,900
29	Downtown Neighborhood	Office	6	1,300	7,800	3,871
30	Downtown Neighborhood	Office	5	1,300	6,500	3,500
15	Downtown Core	Commercial	5	1,300	6,500	6,315
20	Downtown Core	Medical Office	5	1,300	6,500	1,507
21	Downtown Core	Office	9	1,300	11,700	3,082
22	Downtown Core	Medical Office	4	1,300	5,200	3,103
			72		**93,600**	**42,248**
Totals			**755**		**708,300**	**150,508**

The forecast of existing electric and natural gas loads on the same transitioning sites was taken from previous analysis of the future development projects. This is presented on Table 1-8. As can be seen from Table 1-8 existing non-residential space for each land use was 150,508 square feet. The amount of space estimated to be developed is 708,300. Thus, we have estimated habitable space created through new development would increase by almost five-fold. Again, we consider this to be an exercise in conservative analysis in that the considerably more dense reuse of the land will result in higher stresses of the natural gas and electric delivery system.

Table 1-9: Forecast of Existing Loads From Land Transitioned to Residential Use

Land Use	*Square Feet of Existing Use*	*Electric Usage (Watts/SF)*	*Electric Demand (KW)*	*Gas Usage (therms/sf/yr)*	*Gas Demand (cf/hour)*
Commercial	57,584	8.0	461	49.7	816.8
Industrial	36,323	10.0	363	49.7	515.2
Medical Office	4,610	8.0	37	49.7	65.4
Miscellaneous	41,538	8.0	332	49.7	589.2
Office	10,453	8.0	84	49.7	148.3
Parking Lot	-	3.0	-	0	-
Vacant	-	0.0	-	0	-
	150,508		**1,277**		**2,135**

Table 1-9 presents the estimate of gas and electric loads of the existing land uses that will be transitioned to residential use. Table 1-9 summarizes the total square feet of development by existing use and applies the shown electric and gas peak demand load factors based on square feet of developed space. For example, for commercial use, there is 57,584 square feet of developed space. Using the demand factors, this translates to 461 KW of peak electric demand and 817 cubic feet per hour demand for natural gas. The overall figures are totaled at the bottom of the table and are imported into Tables 1-4 and 1-5 for the comparative load analysis presented above.

Non-residential Land Use and Loads

The forecast of loads for the non-residential portion of the future development projects is developed in Tables 1-10 and 1-11. The process is similar to that described above to develop the residential load forecast. Table 1-10 presents the transition of existing land uses to future development land uses by site within the future development projects. (There is no overlap of sites between residential and non-residential future development uses in any of the groups of Tables 2 and 3.) In Table 1-10, future development use is targeted to either commercial or office space use. The square footage of the future development use is also presented. As can be seen, the estimated commercial use under the Downtown Martinez Specific Plan is 23,400 square feet and the estimated office space use is 42,100 square feet.

Table 1-10: Non-Residential Development Use				
Site	*Sub-district*	*Current Use*	*Future Use*	*Square Feet*
11	Downtown Core	Industrial	Commercial	9,900
18	Downtown Core	Commercial	Commercial	6,000
24	Downtown Core	Industrial	Commercial	7,500
			Commercial Subtotal	**23,400**
9	Downtown Core	Commercial	Office	2,600
18	Downtown Core	Commercial	Office	6,000
24	Downtown Core	Industrial	Office	7,500
5	Downtown Shoreline	Industrial	Office (live/work)	26,000
			Office Subtotal	**42,100**

Gas and electric loads for both the existing use and future development use are presented in Table 1-11. The table is constructed in two sections (upper and lower) for existing use and future developed use load forecasts. Once again, the three non-residential sub-categories are identified as commercial, office and industrial. The existing square footages were available from previous work done on this project and are presented in the upper section. The electric and gas consumption factors are presented for the existing use, and peak electric and gas loads are calculated. As can be seen, the existing electric load is estimated as 1,616 KW and the existing gas load is estimated as 2,543 cubic feet per hour. The estimates for future developed use are similarly calculated in the lower section. Note that there is a significant decrease in the amount of developed space under the Downtown Martinez Specific Plan, from 179,300 to 65,500, or over a 60 percent decrease in inhabited space. This is mostly a function of eliminating industrial space usage in the Downtown Core and Downtown Shoreline areas. Load estimates for the future developed space reflect both the decrease in developed space and more efficient uses of energy. Once again, the more efficient energy use is premised on improved construction standards such as Title 24 and local regulations. Overall, for the non-residential land uses that remain non-residential, we see the estimated decrease in both electric and gas demand through implementation of the future development projects, by almost 80 and 60 percent respectively for electric and gas demand. These results are imported into the analysis conducted in Tables 1-4 and 1-5 and presented above.

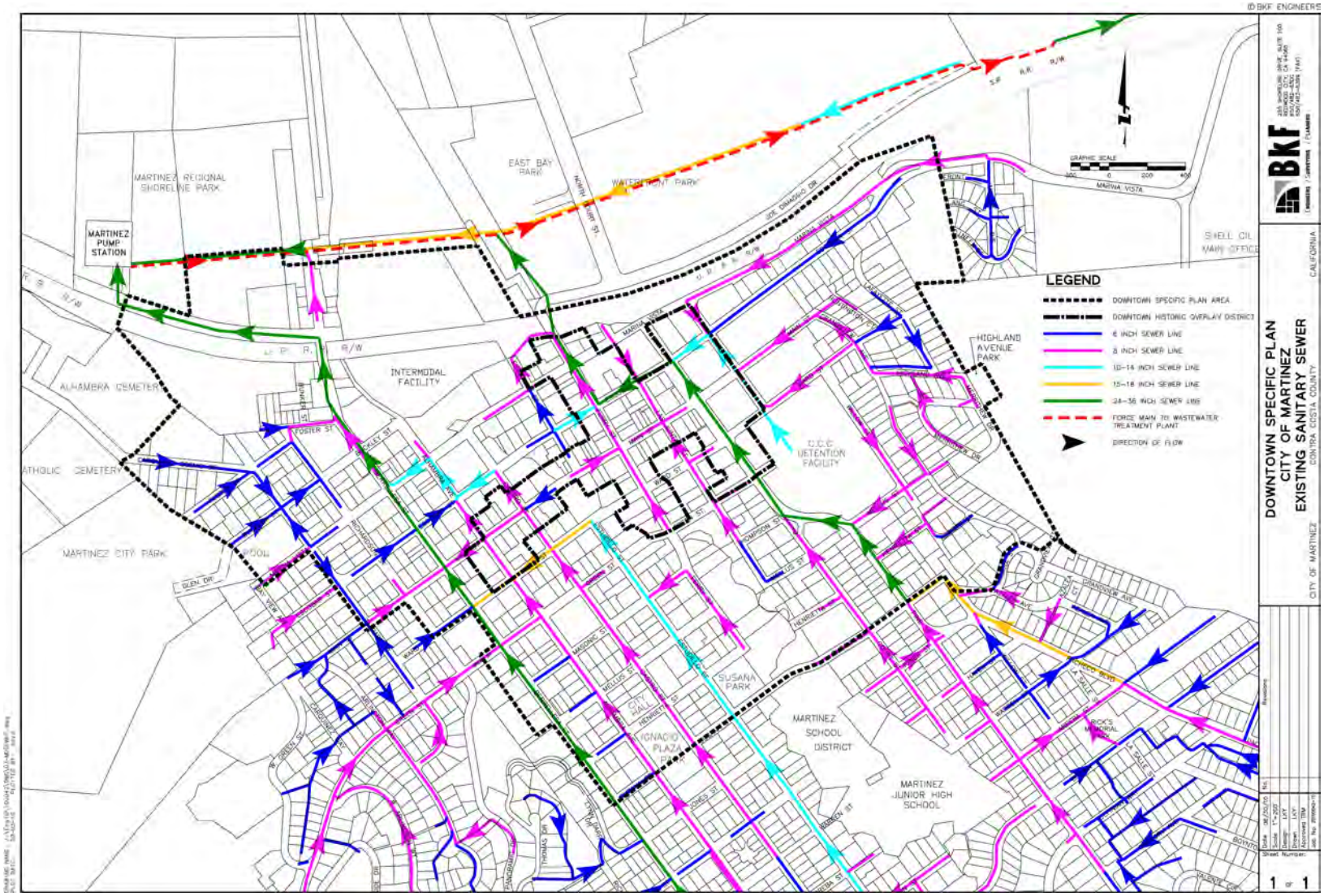
Table 1-11: Non-Residential Land Use and Load					
Land Use	*Existing Use (SF)*	*Electric W/SF*	*Gas Ave CF/H*	*Existing Electric Load (KW)*	*Existing Gas Peak Load (cf/h)*
Commercial	58,500	8	49.7	468	830
Office	15,100	6	49.7	91	214
Industrial	105,700	10	49.7	1,057	1,499
Total	**179,300**			**1,616**	**2,543**
Land Use	*Developed (SF)*	*Electric W/SF*	*Gas Ave CF/H*	*Developed Electric Load (KW)*	*Developed Gas Peak Load (cf/h)*
Commercial	23,400	5	49.7	140.4	331.90
Office	42,100	6	49.7	210.5	597.14
Industrial	-		49.7	-	-
Total	**65,500**			**351**	**929**

1.3 Sanitary Sewer Demand, Capacity and Infrastructure Adequacy

BKF collected available existing documents provided by the Contra Costa County Sanitary District (CCCSD) to review and understand the sewer infrastructure serving the Downtown Specific Area. A master plan report was prepared by RMC Consultants in May 2010 for CCCSD. This report analyzed the District's complex sewer infrastructure for Martinez, Pleasant Hill, Walnut Creek, Orinda, Lafayette, Moraga, Danville and San Ramon. November and December of 2007, RMC Consultants interviewed various City agencies to collect future land use information. The land use information that was collected was then inputted into sewer models that analyzed pipe capacity issues of the District's sewer conveyance system. The land use information that was included in the "*Adopted Downtown Specific Plan from the City of Martinez dated July 24, 2006*" was incorporated in the sewer models for CCCSD's master plan report. Figure 1-4 shows the existing sanitary sewer infrastructure in the Downtown area.

The 2010 CCCSD master plan report provides a high level overview of the District's sanitary sewer conveyance system and does not specifically address the Martinez Downtown area. The review team provided CCCSD land use information documented in the Downtown Specific Plan. CCCSD used this information to do their own analysis of pipe capacity issues for existing and future conditions. In their analysis, CCCSD revealed that a portion of the Alhambra Avenue line currently has pipe capacity issues. CCCSD's analysis confirms with RMC Consultants analysis of the Alhambra Avenue in the master plan report.

Figure 1-4 Existing Sanitary Sewer



MARTINEZ-ALHAMBRA AVENUE CORRIDOR (A3-A)

The CCCSD Master Plan report refers the Martinez-Alhambra Avenue Corridor as the Alhambra trunk line in the City of Martinez. It is identified as Project ID "A3-A" in the master plan report. This is shown in Figure 1-5 below from the CCCSD master plan report.

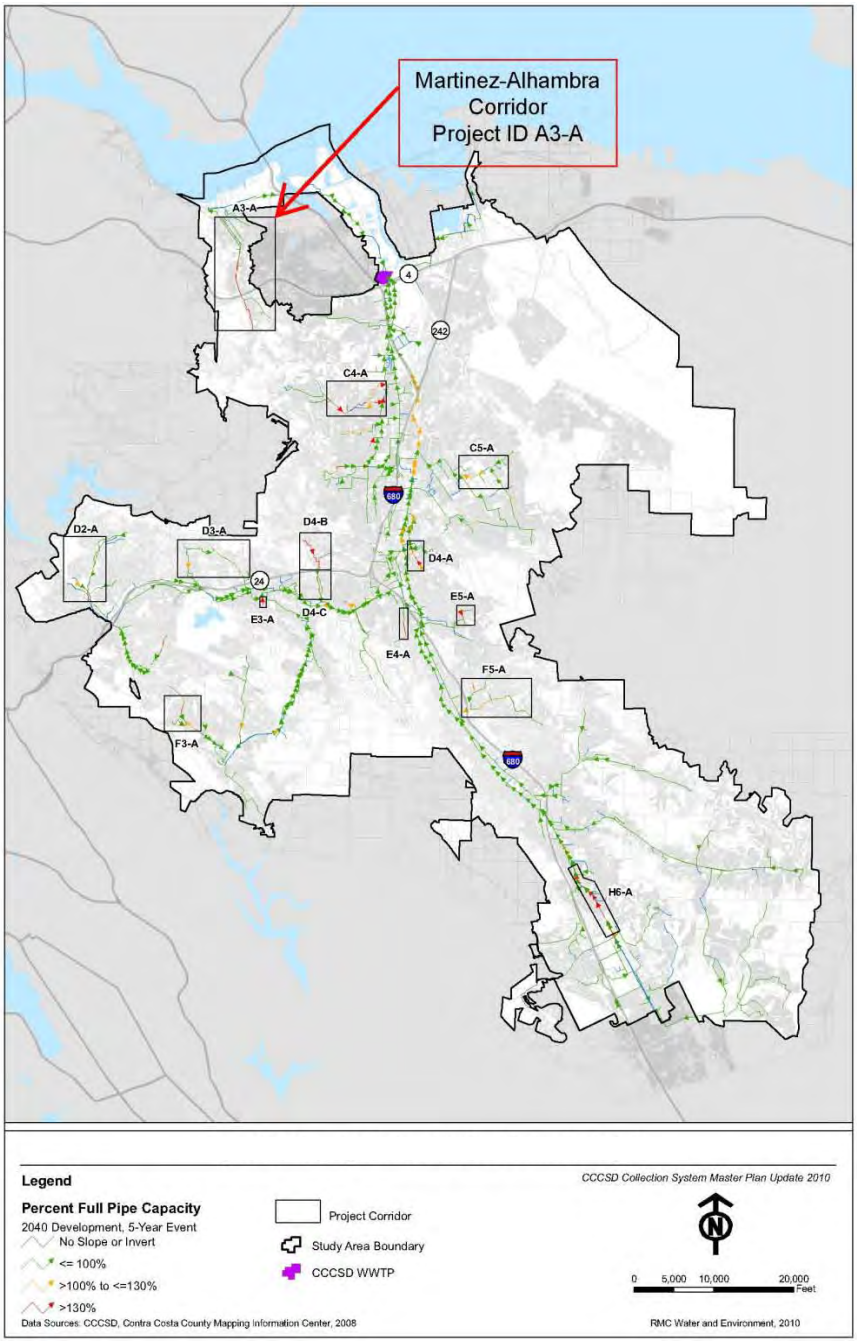
The Alhambra Avenue trunk line consists of various pipe sizes that range from 6"-12". Sewer in the Alhambra trunk line conveys from south to north in Martinez and through the Downtown Martinez area. The master plan report recommends that portions of the sewer line be replaced with pipe sizes ranging from 18"-24". Figure 1-6 shows the area in the trunk line that is recommended to be replaced. If the Alhambra trunk line is upsized, the downstream lines can be relieved of their pipe capacity issues.

In CCCSD's analysis, sewer lines from Brown Street to Escobar Street in Alhambra Avenue currently have pipe capacity issues.

The CCCSD Master Plan report concludes that the Alhambra trunk line in Martinez would be impacted by future development causing the downstream lines in the Downtown Specific Plan area to have pipe capacity issues.

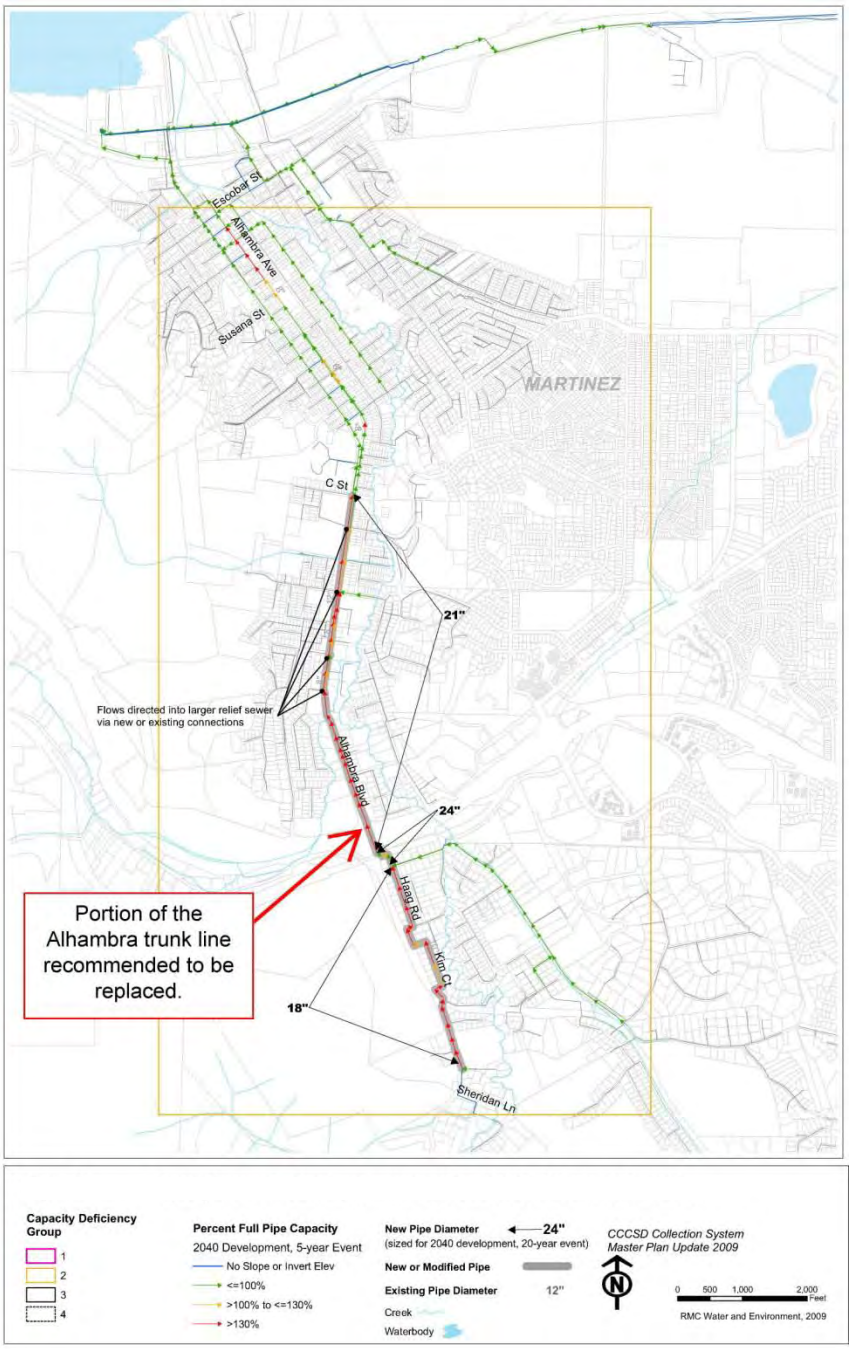
CCCSD further analyzed the sewer infrastructure in the Downtown Specific Area. In their analysis they concluded the following sewer lines will be impacted by the expansion of the Downtown Specific Area in accordance to the land uses described in the "*Adopted Downtown Specific Plan from the City of Martinez dated July 24, 2006*".

Figure 1-5: Capacity Deficiency Corridors for Identified Projects



Source: Figure ES-3: Capacity Deficiency Corridors Identified for Projects, CCCSD Collection System Master Plan Update Final Report-Appendices Vol. 1, dated May 2010

Figure 1-6: Capacity Deficiencies and Improvements for Corridor A3-A



Source: Figure 12: Capacity Deficiencies and Improvements for Corridor A3-A, CCCSD Collection System Master Plan Update Final Report-Appendices Vol. 1, dated May 2010

MAIN STREET

On Main Street between Berrellesa and Alhambra Avenue is an 8" sewer line. Per CCCSD's analysis, this sewer line currently has pipe capacity issues that are caused by a portion of the flow from the Alhambra Avenue line. Refer to Figure 1-7: Exhibit D for the sewer line on Main Street.

Pipe capacity issues for the 8" sewer line on Main Street can be resolved by upsizing the existing Alhambra Avenue line as recommended in the CCCSD master report. Upsizing the Alhambra Avenue trunk line will relieve the pipe capacity issues in the downstream lines that are in the Downtown Specific Area.

FOSTER STREET

On Foster Street between Richardson and Berrellesa Avenue begins as a 6" sewer then transitions to a 8" sewer before reaching the 27' trunk on Berrellesa Avenue. Per CCCSD's analysis, this sewer line is the only area that will have pipe capacity issues caused by the development in Downtown Martinez. Proposed in the Downtown Specific Plan is a 272 unit multi-family development. Refer to Figure 1-7: Exhibit D for the sewer line on Foster Street.

Pipe capacity issues for the 6" & 8" sewer lines on Foster Street can be resolved by diverting the sewer flow from the 272 units into the 27" sewer line in Berrellesa Avenue. If this can be achieved then the sewer lines on Foster Street may not need to be upsized.

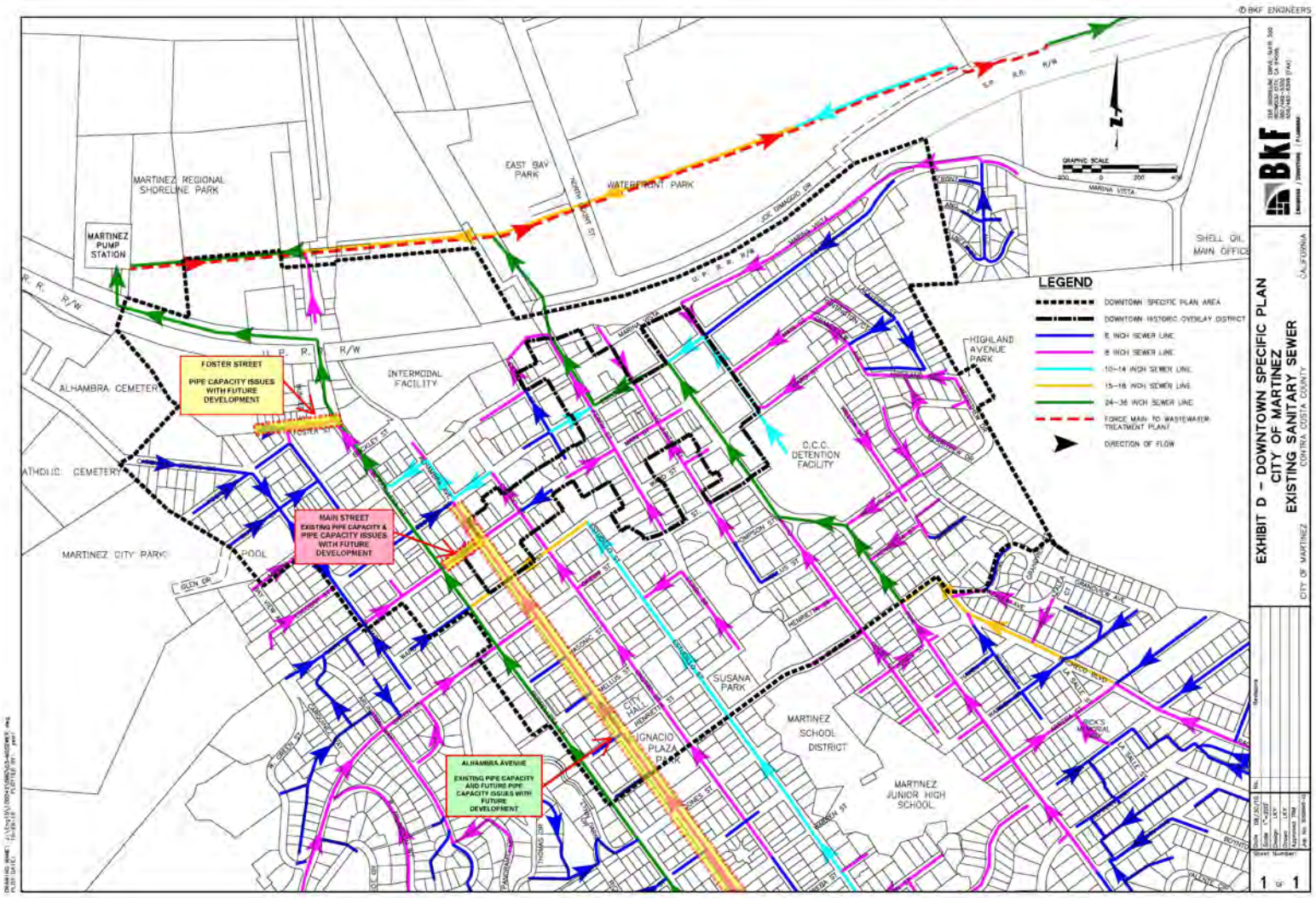
CONCLUSION

In conclusion, the Alhambra Avenue trunk line that is mentioned in the CCCSD master report will have an impact to the downstream sewer lines with the future development of the Downtown Specific Plan. If plans to improve the pipe capacity of this line is deferred prior to the development of the downtown area, approximately 1526 linear feet of sewer line on Alhambra Avenue in the downtown area will be have pipe capacity issues.

Main Street will continue to have pipe capacity issues unless the Alhambra Avenue trunk line is improved. If the trunk line is not improved then 8" sewer line would need to be upsized to accommodate the additional flow.

Foster Street currently doesn't have pipe capacity issues, but if further planning of the proposed 272 unit multi-family development is not considered, then the 8" sewer line would need to be upsized to accommodate the additional flow.

Figure 1-7: Exhibit D



2 Infrastructure Improvements and Cost

2.1 Natural Gas and Electric

This section (1) develops a strategy that defines opportunities and challenges of infrastructure upgrades; (2) evaluates capital enhancements and costs; and (3) recommends infrastructure system design, location and management approaches that might enhance the Downtown Martinez Specific Plan. These will be addressed in order in three sections below.

OPPORTUNITIES AND CHALLENGES OF UPGRADING THE INFRASTRUCTURE

Chapter 1 presented an evaluation the general ability of the natural gas and electric delivery infrastructure to meet development objectives of the Downtown Martinez Specific Plan within the priority development project area. The finding were that neither the natural gas and electric distribution systems was in need of upgrades to accommodate the development objectives laid out in the Downtown Martinez Specific Plan. This finding was confirmed through discussions with PG&E representatives for the gas distribution system, the electric distribution system and the PG&E planners responsible for general customer or "new business" interfaces. Because there are no facility upgrades that are required either now or in the foreseeable future, there are no "challenges" to upgrading the gas and electric infrastructure that would accompany the Downtown Martinez Specific Plan.

The robust status of the gas and electric delivery infrastructure is largely due to the fact that, as the franchised owner and operator of the gas and electric distribution systems, PG&E is responsible to maintain its system in order to provide ongoing services. The normal planning processes that PG&E follows is insightful. It also allows an avenue by which the City of Martinez can interface with the utility in order to promote forward-looking abilities to maintain adequate infrastructure capabilities. The general planning processes for both the natural gas and electric systems were discussed with PG&E representatives. They are described as follows.

Five-Year Master Plan

Planners for both natural gas and electric distribution functions perform a study of areas served by their respective distribution facilities on a five-year basis. The studies look at existing load, probable changes in load, and existing distribution facilities. The study produces forecasts of load growth and its impacts on the distribution system. Changes in load represent normal growth and may also include possible new development projects. If the load forecast combined with the existing system facilities dictates a need to change the distribution system, an investment project is identified. The

cost associated with this investment is considered a utility cost; it is paid for by the utility and recovered through inclusion in the rate base. These costs would not be assigned to third parties.

As part of its research into these studies, PG&E facility planners seek out any planned or possible changes in use (gas and/or electric load) for the area being reviewed. This outreach is facilitated by communications between the City and PG&E, and allows a more specific review of policies such as the Downtown Martinez Specific Plan.[5] Changes in load do not include new development projects, such as a development of a new neighborhood. If load growth results from a project initiated by a third party, the cost is based on PG&E's Rules 15 and 16 (addressed below).

Annual Peak-Usage Reviews

Each peak season (winter for natural gas and summer for electricity), PG&E distribution planners review the operational impacts of load on facilities. This effort is an ongoing process to assure the existing facilities are performing at expected levels. The annual studies are based on data collected from meters and major equipment. Analysts search for loads that may be greater than anticipated, conditions that might be caused by deteriorated system conditions, etc. If a condition is identified, further studies are pursued to define the condition and a resolution. Costs for these studies and any maintenance actions are paid by the utility.

Projects Identified by Application

The utility faces ongoing applications for service from gas and electric customers. These applications can be for a new customer at an existing service point, for an upgrade in an existing service point(s), or for new service points. Additionally, a major project could require extension of PG&E delivery infrastructure from existing locations to the location of a new project. The cost ramifications for any given application is very site-specific, and is difficult the gauge before the fact. PG&E has a set of rules that guide the service application process that include provisions for construction and cost allocation between the applicant and PG&E. These rules are very similar for gas and electric service requests,[6] and are described below.

Distribution Line Extensions (Rule 15)

Rule 15 covers situations when an applicant requests gas or electric service at a location that has no proximate distribution facilities over which to provide service. Rule 15 situations are usually associated with new residential development projects involving multiple dwellings or larger commercial or industrial projects. Although not certain, applications for service to locations that are within an area currently receiving gas and electric service are quite likely not to require distribution infrastructure, as existing facilities are close by.[7]

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[5] For instance, during a meeting with PG&E planners, the City was encouraged to provide land use forecasts included in the Downtown Martinez Specific Plan for inclusion in the upcoming 5-year electric plan.

[6] PG&E has a web site that presents all of its gas and electric preliminary statements, rules, and rate schedules. It can be found at: www.pge.com/tariffs/GR.SHTML#GR

[7] If a new project increases load beyond existing service capabilities, an upgrade may be required and could be treated as an extension.

The only sites with significant potential for increased electric load are opportunity sites 3, 4 and 5 (detailed in Chapter 1). Together, our forecast is for an increase of 991 KW of peak load. However, there is a 21 KV line virtually along the property boundaries of these three sites. Thus, we see little chance that a Rule 15 upgrade would be required to serve the new load. A similar logic exists for natural gas: the same properties are adjacent to a 6-inch gas line. A Rule 15 extension would not likely be required.

Rule 15 requires the applicant to define its gas and electric needs (loads). The utility then studies what it will take to meet those needs, and the applicant becomes responsible to pay up-front costs of constructing the infrastructure. The applicant is responsible for certain costs associated with a distribution line extension. These costs are laid out in Rule 15. The applicant is responsible to provide certain components of the line extension, and is required to pay PG&E for these costs. The applicant must pay a deposit for distribution line extension costs as specified in Rule 15, but these costs are subject to certain refunds that are broken into residential and non-residential refund policies. Residential projects are allocated a fixed amount of refund (for electric projects, $1,918 per unit, and for gas, $1,086 per unit depending on gas appliances in the structure). These amounts cover PG&E's costs for both the distribution line extension (Rule 15) and the service connection (Rule 16 – see below). Non-residential projects are allocated a refund amount based on the estimated gas or electric revenues that PG&E will receive from customers connected to the project. This amount is entirely case-specific, but is seldom enough to cover the full cost to the applicant.

The applicant has two sources of refund for Rule 15 costs. First, there are residential and non-residential refunds available as load is connected to the newly constructed distribution line extensions as described above. Second, if there are multiple projects that use the distribution line extensions, additional applicants are allocated pro-rata shares of the costs. These shares are also refunded to the original applicant.

Overall, we do not expect the projects identified in the Downtown Martinez Specific Plan to incur distribution line extension costs. This is primarily due to the infill nature of the plan, i.e. project proximity to existing distribution infrastructure, and the finding that the planned development is not likely to stress existing distribution system capacities and capabilities.

Service Extensions (Rule 16)

All new services are required to apply for service from PG&E. These applications are subject to Rule 16. Under Rule 16 there are no standard percentage cost splits. Rather, the applicant is responsible for specific work and components. These include site preparation, installation of underground conduits and fixtures (boxes, etc.), and right-of-ways. PG&E is responsible for all conductors, switchgear, transformers and metering equipment. The applicant's share of PG&E's costs is subject to refund under the combined policies of Rule 15 and 16 (amounts discussed above). Projects identified in the Downtown Martinez Specific Plan will be subject to Rule 16 costs if there are any changes in the physical deliver of gas or electricity.

Costs associated with Rule 16 are entirely site-specific and cannot be estimated without detailed information. However, the usual finding under many development scenarios is that, for residential development, Rule 16 costs are generally offset by the rebates. This is more likely the case for more dense development scenarios, such as the Downtown Specific Plan, which anticipates a high degree

of multi-family residential development. For services to commercial properties, it is found similarly that rebates generally offset costs. However, it should be noted that if developers require non-standard delivery options (for example, underground transformers, re-located meters or other cosmetic accommodations), the additional cost falls on the developer.

Undergrounding of Utilities

The City has implemented a requirement in its City Codes that all new electric distribution lines must be undergrounded[8]. According the City's code, all new distribution line extensions are required to be undergrounded (Section 13.29.020) at the developer's expense. This requirement will be carried forward by PG&E through its Rule 15 requirements. However, there is a provision in the City Code for exceptions to this rule, in Section 13.28.040, which allows for the City's Planning Commission to waive the rule under certain conditions. Thus, the cost of undergrounding line and service extensions might be subject to additional control depending on applicability of the City Code requirements. In any case, the cost of meeting such requirements will fall on developers.

Capacity Management

Given results and trends identified in above efforts, PG&E will manage its delivery infrastructure through switching load on between delivery infrastructure or increasing capacities as it sees fit. All this work is done as part of ongoing business management and is funded through PG&E and its rates.

Special Projects Identified by the Utility

PG&E may define special projects that provide for upgrading the gas and electric distribution facilities. Such projects would be expected to enhance the serviceability of related infrastructure, including potentially increasing delivery capabilities. Two such projects are identified for near future implementation within the City of Martinez. For the electric system, new "smart meters" are being placed in service. Smart meters are heralded as transforming the distribution system into a more actively managed facility that will provide greater, more comprehensive services. Details on specific uses of the smart meters are yet forthcoming from PG&E. For the gas side, PG&E has initiated a replacement program for copper service lines (to be replaced with plastic). This project is not likely to upgrade distribution capabilities, but could improve service to individual customers. Overall, the City again has the opportunity to interface with PG&E as it implements these programs.

CAPACITY ENHANCEMENT PROJECTS AND COSTS

The recurring theme of this analysis is that no infrastructure upgrades have been identified nor are any expected in the future due to the Downtown Martinez Specific Plan. Nevertheless, PG&E has one additional upgrade program that should be mentioned (and that the City has made use of multiple times). This is its Electric Undergrounding Program, defined by its Rule 20. Rule 20 is a utility-sponsored program that sets aside amounts of funds that become available to cities for the purposes of undergrounding electric distribution facilities. There are three sub-parts to Rule 20: Sec-

[8] See, Martinez Code of Ordinances, Chapter 13.28 Underground Utility Installation. The code is available at the website, http://search.municode.com/html/16716/level3/MACA_TIT13UT_CH13.28UNUTIN.html

tion A, providing offsetting funds to cities that participate in a project; Section B, typically used by developers for larger developments that must be undergrounded but do not qualify for Section A; and Section C, for smaller projects. Section B and Section C projects do not receive Rule 20 funding from PG&E and are paid for by the developers subject to a rebate of what PG&E would have had to invest had the project been an overhead project. Developers are also able to make use of any Rule 15 and Rule 16 refunds that may be available. Again, due to the nature of the projects identified in the Downtown Martinez Specific Plan, we do not expect to see undergrounded distribution line extensions.

The funds made available by Section A of Rule 20 usually do not cover the entire cost of an undergrounding project, so a special funding district is typically set up to complete funding requirements. Timing for Rule 20 projects can reflect cost and funding requirements. Martinez has several Rule 20 projects already completed. There is also a Rule 20 project currently underway, the Marina Vista project. Finally, the City has identified a Rule 20 project within the Downtown Martinez Specific Plan Area along Ward Street that will virtually complete undergrounding for all non-residential areas within the priority development area and another project outside the downtown area along Alhambra Avenue between Highway 4 and Alhambra Valley Road.

Other than the ongoing and planned Rule 20 involvement, we see no additional need for capacity enhancement projects related to the Downtown Martinez Specific Plan.

INFRASTRUCTURE AGE UNLIKELY TO DELAY DEVELOPMENT OR INCREASE COST

The City has expressed concerns that, due to the age of PG&E's natural gas and electric distribution infrastructure, it may not be able to support the development contained within the Downtown Martinez Specific Plan, or alternatively, that the cost of updating the natural gas or electric systems might fall on developers, thereby impeding the progress of implementing the plan. The analysis conducted as part of this project provides good evidence that the City should not be concerned: PG&E's systems are in good shape and PG&E has the responsibility to keep them so. The cost of doing this is included in PG&E's ongoing cost of operating its gas and electric systems, and except under unlikely (and unidentified) development scenarios, there should be no system upgrade costs assigned to future developers within the Downtown Martinez Specific Plan area. The factors supporting this assessment are included in Chapters 1 and 2. More specifically, it is noted in Chapter 1 that:

- PG&E is currently providing satisfactory service to the Downtown Specific Plan area;
- Evaluation of the growth impacts of the Downtown Specific Plan indicate a likely constant or possible decrease in load for gas and electric delivery;
- PG&E has an obligation to serve, which translates into an obligation to keep its delivery systems in good working order and to increase capacity when and as needed;
- And, perhaps most importantly, over the past ten or fifteen years, PG&E has undergrounded significant portions of its electric distribution system. As the system has been undergrounded, PG&E has effectively replaced the old system with a newer one, including upgrades in materials and overall system integrity.

PG&E's planning and investment program for its natural gas and electric delivery systems are elaborated above; a summary outline of PG&E's planning and upgrade process as follows:

- For each system, PG&E conducts a 5 year master plan based on existing and forecast load conditions;
- Each year PG&E conducts annual peak usage reviews to study whether there are any abnormal system conditions that are apparent based on measured and metered control points for both the gas and electric systems;
- For both gas and electric systems, PG&E identifies specific capital projects that may become required in order to meet issues identified in the above work or identified through other means (new policies, operation plans, etc.)
- For each system, PG&E defines and completes upgrade projects that result from City or customer requests, such as undergrounding projects or new expansion projects. If new projects are requested, developers will likely be responsible for portions of the system expansion if required (under PG&E's Rule 15), but reimbursements are available to partially offset these costs. It should be noted that our review of the Downtown Martinez Specific Plan did not identify any likely Rule 15 projects.

RECOMMENDED INFRASTRUCTURE SYSTEM DESIGN, LOCATION AND MANAGEMENT

As addressed above, there is only one system upgrade opportunity identified in the Downtown Martinez Specific Plan, which is a Rule 20 project that has already been identified by the City. With completion of this project, the only remaining non-undergrounded system will be in residential areas. It seems unlikely that additional undergrounding will be called for in the near future. No additional projects appear to be required and none have otherwise been identified through this study.

The only other recommendation that is considered for managing the gas and electric infrastructure is the potential use of the City Municipal Code exception for undergrounding (Section 13.28.040). Clearly, this exception must be considered on a case-by-case basis, and is likely to affect only the smaller project sites that may not be aligned with currently undergrounded distribution infrastructure.

2.2 Sanitary Sewer

As described in Chapter 1 and in the Contra Costa County Sanitary District (CCCSD) master plan report,[9] portions of sewer lines in Alhambra Avenue for transmission capacity are currently experiencing pipe capacity issues. CCCSD performed additional analysis of the existing sewer infrastructure in Downtown Martinez area for capacity in the local collection. Their analysis was consistent with the results from the CCCSD master plan report. In addition, other sewer lines would be impacted by the development proposed by the Downtown Specific Plan.

Chapter 1 also highlighted various streets in which pipe capacity issues currently exist or will result from the future development of the downtown area. This section reiterates the sanitary sewer improvements and provides a cost estimate to upsize sewer lines to accommodate development proposed by the Downtown Specific Plan.

This memorandum outlines the cost estimate to upsize sewer lines if the Alhambra Avenue trunk line is not upsized in time for the development proposed by the Downtown Specific Plan.

MAIN STREET BETWEEN BERRELLESA STREET AND ALHAMBRA AVENUE

The 8" sewer line on Main Street currently has pipe capacity issues. Additional sewer demand from the future Downtown Specific Plan development will increase sewer flow in this pipe to a capacity of 186% (2040-20 year design)[10] if the Alhambra Avenue improvements area not in place before the downtown expansion.

To determine the required pipe size to accommodate the increased future sewer demand, we use Manning's equation.

Design Criteria

Manning's Equation, $Q=(1.49/n)AR^{2/3}S^{1/2}$, where:

Q = flow (cfs)

n = coefficient pipe roughness

A = area (ft^2)

R = Hydraulic Radius (feet)

S = pipe slope (feet/feet)

[9] CCCSD Collection System Master Plan Update Final Report-Appendices Vol. 1, dated May 2010

[10] CCCSD 2040-20 year design exhibit and table to BKF Engineers dated December 3, 2010.

Per CCCSD's analysis, the 8" sewer line will anticipate a sewer flow of 1.22 mgd (1.88 cfs).[11] According to CCCSD's Standard Specifications for Design & Construction sewer pipes are typically design two-thirds full (d/D< or = 0.67). Table 2-1 below shows the different pipe sizes and flows for a pipe designed at two-thirds full capacity.

Table 2-1: Two-Thirds Full Capacity Pipe Sizes and Flows

Pipe Size	*Min. Slope*	*Flow, Q (cfs)*
8"	0.0077	0.85
10"	0.0057	1.29
12"	0.0022	2.47

Since the anticipated sewer flow is greater than 1.29 cfs for a 10" sewer, it is determined that the required pipe size for Main Street be replaced as a 12" sewer if the Alhambra Avenue improvements are not in place before the downtown expansion.

Cost Estimate

Table 2-2: Cost Estimate for Main Street shows the cost estimate to replace the 8" sewer line to a 12" sewer line. This cost estimate is based on 2010 construction costs. The unit cost for the sewer replacement on Main Street includes the cost to trench and backfill the existing street, material and labor cost and the replacement of the existing street section.

Table 2-2: Cost Estimate for Main Street (between Berrellesa Street and Alhambra Avenue)

Description	*Qty*	*Unit*	*Unit Cost*	*Amount*
12" VCP	258[12(2)]	LF	$120	$30,9600
			Subtotal	**$30,960**
			20% Contingency	$6,192
			15% Design & Staking	$4,644
			5% Project Management	$1,548
			Subtotal	**$12,384**
			TOTAL	**$43,344**

FOSTER STREET BETWEEN RICHARDSON AND BERRELLESA STREET

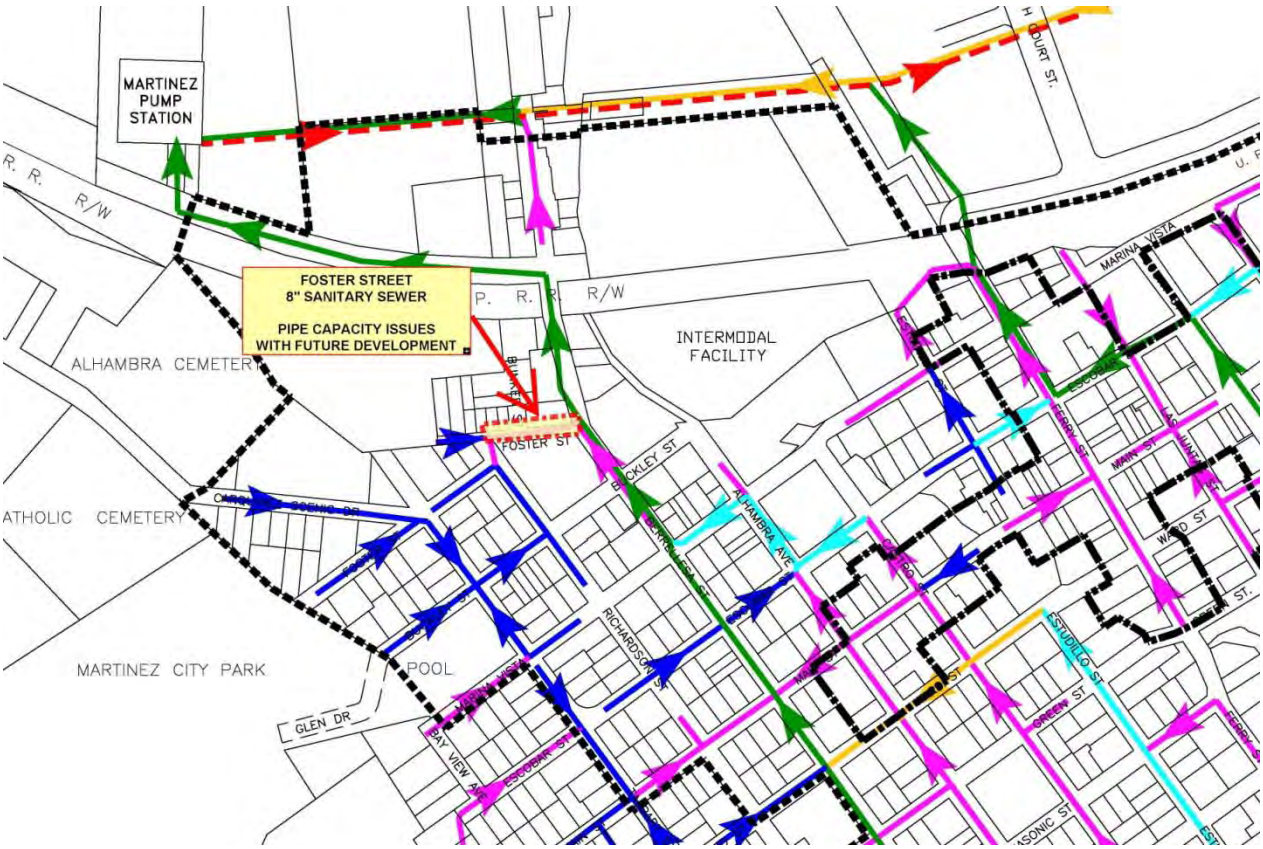
The sewer lines on Foster Street do not have any current capacity issues. However, additional sewer demand from the proposed 272 multi-family units that is planned at the adjacent parcel in the Downtown Specific Plan will have an impact to the existing 6" & 8" sewer lines on Foster Street if

[11] Ibid.

[12] Length of sewer is per sewer GIS files from CCCSD.

they are not diverted to the 27” sewer line on Berrellessa Street. Figure 2-1 below shows the location of the existing sewer lines on Foster Street.

Figure 2-1: Foster Street between Richardson Street and Berrellesa Street



The 6” line will experience a 125% pipe capacity and the 8” line will experience a 111% pipe capacity. [13]

If the sewer flow from the proposed 272 multi-family units is not diverted to the 27” line on Berrellesa Street, then the 6” & 8” sewer lines would require a larger pipe size. Future sewer flow of these two sewer lines was not available at this time. Therefore, we will use Manning’s equation and their calculated future pipe capacity to determine the future flow in the sewer lines.

[13] CCCSD 2040-20 year design exhibit and table to BKF Engineers dated December 3, 2010.

Design Criteria

According to CCCSD's Standard Specification for Design & Construction 2010 Edition, sewer design for a 6" & 8" sewer lines are typically designed flowing two-thirds full (d/D < or = 0.67). Using CCCSD's design criteria and Manning's equation, we get the following flow for the future 6" sewer on Foster Street.

Manning's Equation, $Q=(1.49/n)AR^{2/3}S^{1/2}$, where:

Q = flow (cfs)

n = coefficient pipe roughness

A = area (ft^2)

R = Hydraulic Radius (feet)

S = pipe slope (feet/feet)

Calculate future flow for 6" sewer

Where S = 0.0050 for a 6" sewer (minimum slope per CCCSD standards)

6" @ 0.0050 = 0.32 cfs

0.32 cfs * (125%) = $Q_{2040\text{-}20\ year}$

0.40 cfs = $Q_{2040\text{-}20\ year}$

The anticipated sewer flow in the pipe is greater than a 6" sewer, but less than the typical design flow for an 8" pipe as shown in Table 2-3 below.

Table 2-3: Two-Thirds Full Capacity Pipe Sizes and Flows

Pipe Size	*Min. Slope*	*Flow, Q (cfs)*
6"	0.0050	0.32
8"	0.0050*	0.85

**Replace sewer at the same slope as original pipe size*

The required size for the 6" line in Foster Street if the 272 multi-family units do not discharge into the 27" sewer on Berrellesa Street would be upsized to an 8" pipe. To determine the required size for the 8" sewer, we use the same design criteria as illustrated above.

Calculate future flow for 8" sewer

Where S = 0.0077 for an 8" sewer (minimum slope per CCCSD standards)

8" @ 0.0077 = 0.85 cfs

0.85 cfs * (111%) = $Q_{2040\text{-}20\ year}$

0.94 cfs = $Q_{2040\text{-}20\ year}$

The anticipated sewer flow in the pipe is greater than an 8" pipe, but less than the typical design flow for a 10" pipe as shown in Table 4 below. Therefore, the required size for the 8" line on Foster Street would be upsized to a 10" sewer.

Table 2-4: Two-Thirds Full Capacity Pipe Sizes and Flows

Pipe Size	*Min. Slope*	*Flow, Q (cfs)*
8"	0.0077	0.85
10"	0.0057	1.29

Cost Estimate

Table 2-5: Cost Estimate for Foster Street shows the cost estimate to replace the existing 6" sewer line to an 8" sewer line and the existing 8" sewer line to a 10" sewer line. This cost estimate is based on 2010 construction costs. The unit cost for the sewer replacement on Foster Street includes the cost to trench and backfill the existing street, material and labor cost and the replacement of the existing street section.

Table 2-5: Cost Estimate for Foster Street (between Richardson and Berrellesa Street)

Description	*Qty*	*Unit*	*Unit Cost*	*Amount*
8" VCP	156	LF	$100	$15,600
10" VCP	234	LF	$115	$26,910
			Subtotal	**$42,510**
			20% Contingency	$8,502
			15% Design & Staking	$6,377
			5% Project Management	$2,126
			Subtotal	**$17,005**
			TOTAL	**$59,515**

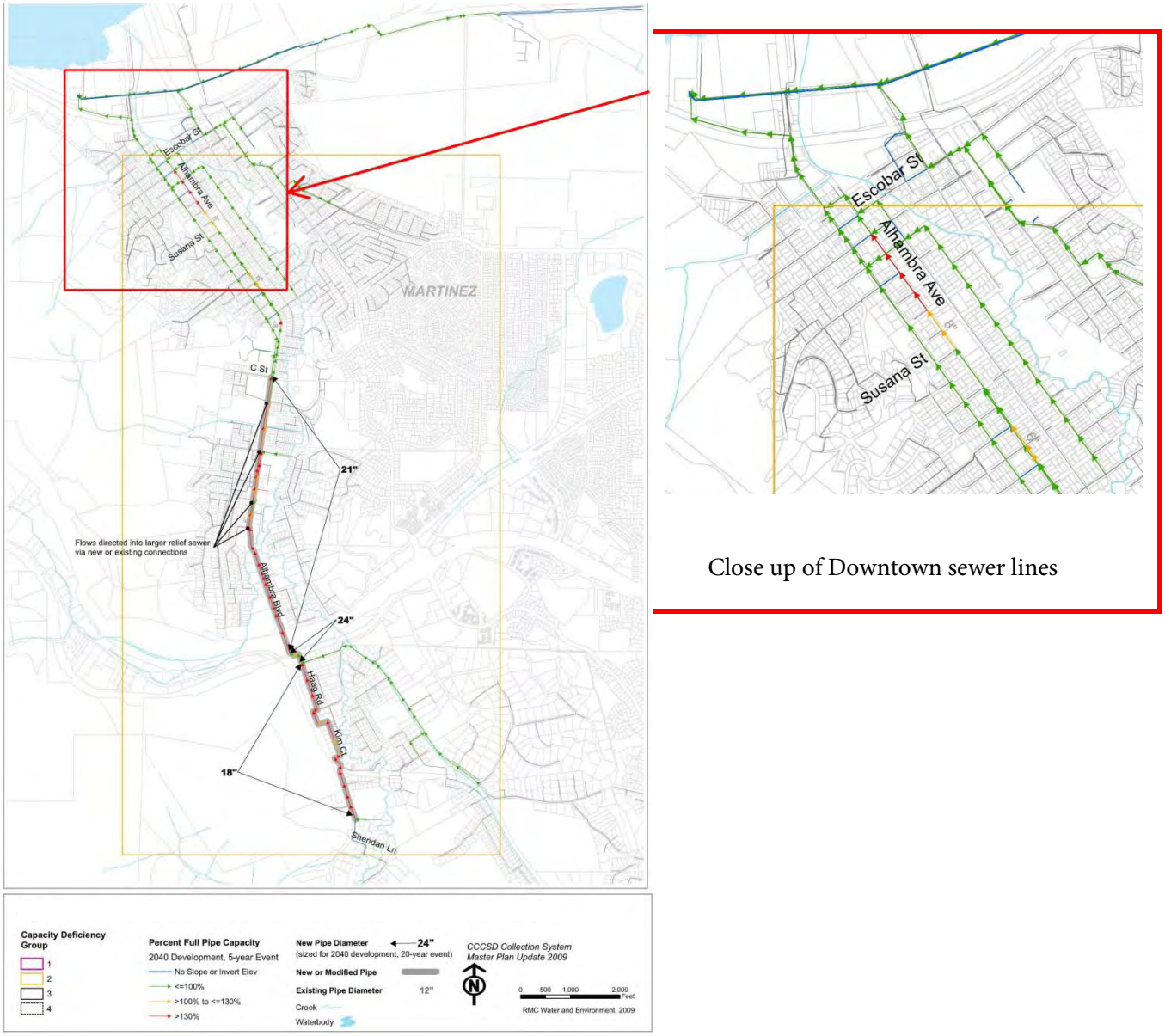
Note: Length of sewer is per sewer GIS files from CCCSD.

ALHAMBRA AVENUE BETWEEN ESCOBAR STREET AND SUSANA STREET

If the City of Martinez proceeds with the expansion of the Downtown area before improvements can be done to the Alhambra Avenue sewer trunk line, then the downstream sewer lines in Alhambra Avenue would need to be upsized to relieve pipe capacity issues and to support the increased sewer demand on the system.

Figure 2-2 below highlights the various sewer lines with pipe capacity over 100%. Yellow lines indicate pipe capacity between 100%-130% and red lines indicate pipe capacity over 130%.

Figure 2-2: Capacity Deficiencies and Improvements for Corridor A3-A: Martinez-Alhambra Ave



Source: Figure 12: Capacity Deficiencies and Improvements for Corridor A3-A, CCCSD Collection System Master Plan Update Final Report-Appendices Vol. 1, dated May 2010.

In Figure 2-2, the affected downstream sewer lines on Alhambra Avenue are between Escobar Street and Susana Street. Approximately 1,516 linear feet of sewer line have a pipe capacity over 100% within the area of the Downtown Specific Plan.

CCCSD analyzed the local collection in the downtown area and determined that the sewer lines between Escobar Street and Susana Street have a pipe capacity between 186%-340% (2040, 20-year design).[14]

We will use Manning's equation to determine the required pipe size to accommodate the increased future sewer demand.

Design Criteria

Manning's Equation, $Q=(1.49/n)AR^{2/3}S^{1/2}$, where:

Q = flow (cfs)

n = coefficient pipe roughness

A = area (ft^2)

R = Hydraulic Radius (feet)

S = pipe slope (feet/feet)

Per CCCSD's analysis, the 8" sewer in Alhambra Avenue between Escobar Street and Susana Street will anticipate sewer flows between 1.01 mgd (1.58 cfs) -2.21 mgd (3.45 cfs).[15]

According to CCCSD's Standard Specifications for Design and Construction 2010 Edition, sewer designs for an 8" sewer are typically designed flowing two-thirds full (d/D< or = 0.67). Using this design criteria, Table 2-6 shows the different pipe sizes and design flows for a pipe designed two-thirds full.

Table 2-6: Two-Thirds Full Capacity Pipe Sizes and Flows

Pipe Size	*Min. Slope*	*Flow, Q (cfs)*
8"	0.0077	0.85
10"	0.0057	1.29
12"	0.0022	2.47
15"	0.0015	4.47

[14] CCCSD 2040-20 year design exhibit and table to BKF Engineers dated December 3, 2010.

[15] Ibid.

The anticipated sewer flows in the 8" pipe in Alhambra Avenue between Escobar Street and Susana Street is between 10" and 15". These sewer lines are required to be replaced if the Alhambra Avenue trunk line mentioned in CCCSD master plan report is not upsized before the implementation of the future Downtown Specific Plan development.

Cost Estimate

Table 2-7: Cost Estimate for Alhambra Avenue between Escobar Street and Susana Street shows the cost estimate to replace the 8" sewer line. This cost estimate is based on 2010 construction costs. The unit cost for the sewer replacement on Alhambra Avenue includes the cost to trench and back-fill the existing street, material and labor cost of the sewer pipe and the replacement of the existing street section.

Table 2-7: Cost Estimate for Alhambra Avenue between Escobar Street and Susana Street

Description	*Qty*	*Unit*	*Unit Cost*	*Amount*
10" VCP *(Escobar to Main Street)*	258[2]	LF	$115	$29,670
15" VCP *(Main to Susana Street)**	1,510[2]	LF	$130	$196,300
			Subtotal	**$225,970**
			20% Contingency	$45,194
			15% Design & Staking	$33,895
			5% Project Management	$11,298
			Subtotal	**$90,388**
			TOTAL	**$316,358**

Note: Length of sewer is per sewer GIS files from CCCSD
**Required pipe size for sewer lines between Mellus and Susana Street were assumed due to lack of future sewer flow information at this time. Further analysis of these lines is to be investigated prior to implementation of the Downtown Specific Plan.*

ALHAMBRA AVENUE TRUNK LINE

In the CCCSD master plan report, it was concluded that portions of the Alhambra Avenue line were recommended to be upsized in order to alleviate pipe capacity in the downstream Alhambra Avenue sewer lines. This report only analyzed the transmission collection line. The CCCSD master plan report recommended that approximately 9,976 linear feet of sewer line be upsized. The estimated total project cost was projected to be $3,964,000[4]. See Figure 2-3 below for summary.

Figure 2-3: Recommended Sewer Improvement Projects by Priority Group

Project ID	Project Name	New Pipe Length[1] (feet)	New Pipe Diameter[1] (inches)	Estimated Total Project Cost[2] ($'000)
Priority Group 1 Projects				
C4-A	Pleasant Hill - Pleasant Hill Rd/Grayson Creek	9,552	18 - 24	4,155
D4-B	Lafayette - Pleasant Hill Road (Phase I – north of Hwy 24)	4,829	15 - 18	1,676
E4-A	Walnut Creek – Lancaster Road	4,067	15 - 18	1,424
H6-A	San Ramon – San Ramon Schedule C	6,628	36	3,300
	Priority Group 1 Subtotal	**25,076**		**10,555**
Priority Group 2 Projects				
A3-A	Martinez - Alhambra Ave	9,976	18 - 24	3,964
D4-A	Walnut Creek - Walnut Blvd.	2,005	18	1,901
E5-A	Walnut Creek – Palmer Road	1,026	15	350
F3-A	Orinda – Moraga Way	6,702	12 - 15	2,592
	Priority Group 2 Subtotal	**19,709**		**8,807**
Priority Group 3 Projects				
D2-A	Orinda - Miner Road/Camino Pablo	826	15	282
D3-A	Lafayette - Happy Valley Road	3,172	15 - 18	1,118
F5-A	Alamo – Stone Valley Road	8,430	15 - 27	3,483
	Priority Group 3 Subtotal	**12,428**		**4,883**
Priority Group 4 Projects				
C5-A	Walnut Creek - Contra Costa Canal Trail	4,539	24	1,820
D4-C	Lafayette – Pleasant Hill Road (Phase II – south of Hwy 24)	3,159	21	1,175
E3-A	Lafayette – Moraga Road	982	15	335
	Priority Group 4 Subtotal	**8,680**		**3,330**
			TOTAL	**27,575**

Notes:
(1) District will refine project alignments and pipe sizes during project implementation.
(2) Engineering New Record Construction Cost Index (ENR-CCI) 9781. San Francisco Bay Area, September 2009.

Source: Table ES-5: Recommended Sewer Improvement Projects by Priority Group, CCCSD Collection System Master Plan Update Final Report, dated May 2010

CONCLUSION

As stated in Chapter 1, sewer lines in Alhambra Avenue between Escobar Street and Susana Street can avoid upsizing if the Alhambra Avenue trunk line is upsized as recommended in the CCCSD master plan report. The sewer line on Foster Street can avoid upsizing if sewer flow from the proposed 272 multi-family unit can be diverted to the 27" sewer line in Berrellesa Street.

The sewer infrastructure is owned and operated by CCCSD. CCCSD would determine the priority of sewer upgrades and how the sewer upgrades would be incorporated within their capital improvements budget. However, if funding to upsize the Alhambra Avenue trunk is not available, then a strategy to capture fair share development costs can be allocated for the improvement of the Alhambra Avenue trunk line. Fair share costs could fall under the responsibility of CCCSD, City of Martinez or the developer depending on the impact of the new downtown development. Additional sewer analysis of these sewer lines would need further investigation prior to the implementation of the Downtown Specific Plan development. Further discussion of how these costs can be allocated will be discussed in Chapter 3.

3 Funding Sources and Financing Strategies

This memorandum provides an overview of financing for infrastructure and discusses specific strategies and recommendations for gas, electric, and sewer infrastructure improvements. Section four of this memorandum includes a list of additional potential funding sources, including grants and loans.

3.1 Infrastructure Financing

There are two types of infrastructure improvements required by the City of Martinez, which may be addressed through different funding strategies.

1. Infrastructure improvements required due to new development; and
2. Infrastructure improvements required to maintain the existing systems and cure existing deficiencies.

Measure J principles, which must be embodied in the General Plan Growth Management Element as a criterion for being able to receive "return to source" funds, include a mandate to charge local and regional impact fees to pay for the cost of new development. Existing infrastructure deficits, on the other hand, must be paid for through general funds, through enterprise funds or service fees, or through assessment districts as they provide an area-wide or citywide public benefit. An overview of financing strategies follows.

FINANCING STRATEGIES

Impact/Mitigation Fees

Impact fees are one way to share costs of improvements. Measure J requires every jurisdiction in Contra Costa County to adopt a Growth Management Element, which requires the City to adopt and maintain in place a development mitigation program to ensure that new growth is paying its share of the costs associated with that growth. Part of the mitigation program must include a local mitigation program, which mitigates development impacts on non-regional routes and other facilities. Under the local mitigation program, a development project funds public facilities and infrastructure requirements as necessary to mitigate directly the impact of the new development and/or pays mitigation fees for public facilities and infrastructure improvements in proportion to the development's impacts. As part of the local mitigation program, the City of Martinez could collect fees for a variety of services, including infrastructure improvements required for the development proposed by the Downtown Specific Plan.

Currently, the City of Martinez charges impact/mitigation fees for development related to transportation, parks & recreation, parks in lieu, and cultural, police, and childcare facilities.[16] The current General Plan Update process offers an opportunity to the City to update its impact/mitigation fee requirements as part of the Growth Management Element update. Further, the Growth Management Element could be updated as a priority, as it does not depend on other elements to be adopted. The Contra Costa Transportation Authority (CCTA) has prepared a model Growth Management Element to facilitate this process.[17]

Developer Contributions

Developer contributions are payments made in addition to normal impact fees as part of the development approval process for specific projects; these most often apply to larger developments with significant associated impacts. Contributions could fund infrastructure improvements.

Developer Provision and Reimbursement

In some cases a developer may provide the needed City infrastructure for a project beyond normal requirements, and in this circumstance the cost of provision of supplemental or oversized infrastructure may be reimbursed in part over time.

City Reimbursement Program

The City of Martinez could enter into reimbursement agreements with developers providing supplemental or oversized infrastructure improvements, authorizing the property owner or developer to fund that portion of the cost of a public facility that exceeds the need for the facility attributable to and reasonably related to the project under a "nexus" analysis. Through the reimbursement agreement the developer would then be paid back for the cost of the improvements in excess of the need attributed to the project. Methods for repayment could include impact fees, assessment districts, and/or tax increment financing, described below.

Central Contra Costa Sanitary District (CCCSD)

CCCSD implements a reimbursement program for developers that install sewer facilities necessary to serve their development or property. This is because, in many cases, this results in new sewers that also serve properties that did not contribute to the cost of the new sewer facilities. Through the reimbursement program, the developer may recoup a portion of the cost of the sewer facilities when other developments connect to the system. Generally, the reimbursement fee that applies to any given sewer facility is determined by taking into consideration the actual cost of construction, engineering costs, zoning regulations, the potential service area, and the number of potential connections to the sewer facility.[18]

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[16] City of Martinez website, 2010. http://www.cityofmartinez.org/depts/planning/forms.asp

[17] Requirements for the update under Measure J are detailed in the Model Growth Management Element, available at www.ccta.net.

[18] Central Contra Costa Sanitary District Website, 2010. http://www.centralsan.org/index.cfm?navId=361

Pacific Gas & Electric

PG&E rules 15 and 16 provide for reimbursement of specific portions of improvements made by developers, discussed in greater detail in section 3.2.

Capital Improvement Program (CIP)

The Capital Improvement Program (CIP) budget is for expenditures on capital projects. The City of Martinez and Central Contra Costa Sanitary District (CCCSD) both maintain CIPs. The City of Martinez CIP includes projects such as major street or park improvements, building construction, and major facility maintenance. The CIP provides a plan for projects that are in progress or will be undertaken during the next two fiscal years. Extensive program funding is provided through grant and Measure J monies and selective commitments from reserves for projects requiring immediate attention.[19]

The CCCSD CIP is a ten-year program for the District's capital facilities and financing needs. The related Capital Improvement Budget is updated annually. The Martinez Alhambra Avenue Trunks expansion in Alhambra Avenue from Highway 4 to C Street is included in the CCCSD CIP, planned to begin implementation in 2017.[20]

Special Assessment Districts

Individuals and businesses can cooperate to create special assessment districts in which they tax themselves (outside the limitations of Proposition 13) or collect fees in order to fund specific benefits, including infrastructure improvements.

Infrastructure Finance District (IFD)

Infrastructure Finance Districts (IFD) are financing entities created in order to fund regional public facilities and infrastructure. IFDs can divert property tax increment revenues for 30 years to finance highways, transit, water systems, sewer projects, flood control, child care facilities, libraries, parks, and solid waste facilities. IFDs may not be used to pay for maintenance, repairs, operating costs, and services. Although this is a tax increment financing tool, there is no blight test necessary; moreover, an IFD may not be part of a redevelopment project area. However, IFDs can be challenging to create, since they require 2/3 approval by the voters to form and issue bonds.

Community Facilities District

Under the Mello-Roos law, passed in 1982 in response to Proposition 13, local cities, counties, and school districts may create community facilities districts (CFD) to finance the construction of needed community infrastructure. The CFD is empowered to levy additional property taxes on

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[19] City of Martinez website, 2010. http://www.cityofmartinez.org/depts/engineering/cip.asp

[20] Central Contra Costa Sanitary District Website, 2010. http://www.centralsan.org/index.cfm?navid=574

land located inside the district, thus creating a dependable revenue stream that can be used in issuing bonds to pay for new infrastructure.

Business Improvement District

Business or property owners within a defined geographic area may agree to assess themselves annual fees, as part of a Business Improvement District (BID). The BID may then fund activities and programs to enhance the business environment; these may include marketing and promotion, security, streetscape improvements, and special events. Once established, the annual BID fees are mandatory for business/properties located within the BID. Generally, this mechanism is most frequently used in existing commercial retail districts and is not used to fund infrastructure due both to the limited revenue base and the short-term nature of the BID structure, which makes issuance of debt infeasible.

Redevelopment and Tax Increment Financing

Establishment of a Redevelopment Agency[21] offers a financial tool that could allow the City to designate target areas for special investment in order to stimulate development. This tool, tax increment financing, allows the Redevelopment Agency to issue bonds against the future property tax revenue expected to be generated, in order to finance public investment within the redevelopment area. The Redevelopment Agency obtains the additional "increment" of property tax growth following the inception of the redevelopment area, which typically increases as the public improvements are put in place and initial investments are made from the public and private sectors. Redevelopment funds may be used to pay for affordable housing, parks, schools, utility upgrades, and other public facilities.

FINANCING CONSIDERATIONS

The Martinez Downtown Plan Specific Plan provides a summary of the pros and cons of funding strategies, outlined below.

Pay-as-You-Go or Debt Financing

As described in the City of Martinez Downtown Specific Plan, financing may be approached in one of two ways, either by making improvements only when sufficient funds are available (pay as you go) or by making improvements by borrowing funds which would be paid back in full or in part for over time (debt financing). Table 3-1 provides an overview of each method, along with the related pros and cons.

[21] The current State budget proposal for FY 2011-12 proposes the elimination of redevelopment agencies; use of this tool would be subject to changes in State law.

Table 3-1: Comparison of Pay as You Go and Debt Financing			
Method	*Overview*	*Pros*	*Cons*
Pay as You Go	The improvement is only made once sufficient tax or fee revenue is gathered to fund the improvement	Very little financial risk to City or District	Improvement takes a long time to implement, could be less effective
Debt Financing	The money for an improvement is borrowed now by issuing bonds, the improvement is made now, and is paid for over time through tax or fee revenue	Improvement made immediately, could be more effective as a result	Some risk that revenue will not be sufficient to pay off debt within time limit

Source: City of Martinez Downtown Specific Plan, 2006.

The pay as you go approach would present little risk to the City or the District because these agencies would collect revenue for infrastructure improvements. However, this method could take a long time to implement, such that improvements to the infrastructure may not be completed in time to support development. Alternatively, if developers are held responsible for improvements without reimbursement, there would be little risk, but this approach would also represent a disincentive to developers.

Debt financing, or a combination of pay as you go and debt financing, may be required in order to support sewer infrastructure improvements in advance of new development, and to encourage new development in the Downtown area. To the extent that loans and grant from other funding sources may be secured, they may help shoulder the cost of the improvements.

Funding Mechanisms

An overview of three common ways of gathering funds for public improvements is provided in Table 3-2. Where infrastructure is provided by the City, CCCSD, and/or a developer that is reimbursed, some mechanism for gathering funds must be established. These include impact/mitigation fees, a benefit assessment district, and tax increment financing.

Table 3-2: Overview of Funding Mechanisms			
Method of Collecting Local Revenue	*Overview*	*Pros*	*Cons*
Impact/Mitigation Fees	Measure J requires that a Development Mitigation Program be included in each jurisdiction's Growth Management Element to ensure that new growth is paying its share of the costs associated with that growth. Through this mechanism the City of Martinez could collect fees for a variety of services, including infrastructure improvements.	▪ Required by Measure J ▪ Represents a fair-share approach to funding improvements required as a result of new development	▪ Added fees may be a disincentive to developers
Benefit Assessment District	Formed to include a geographical area in which all property owners would equally benefit from the proposed improvement. Property owners or businesses within the district area would pay an additional tax or fee in the amount necessary to pay for the improvement in the desired time frame. The individual tax or fee would be lower if the district encompassed a large area, or with a long financing time frame.	▪ Less financial risk to City or public agency; individual property owners take on more risk, although the City may have to take on a defaulted loan under State law ▪ Could lead to increased tax revenue based on private reinvestment	▪ Individual property owners may be unwilling to absorb financing risk, especially for debt financing. Therefore, could be ineffective in the short term if approved ▪ Assessment is considered another form of taxation
Tax Increment Financing	Administered at no additional cost to the property owner or individual businesses, by freezing the property tax revenue at its "base rate" in the current year, and diverting any additional tax revenue each year into a separate pool of money used to finance the improvements, as well as state-required pass-throughs, and the 20% set-aside for housing. Tax increment financing is only implemented with the establishment of a redevelopment agency,[1] or an infrastructure financing district.	▪ Improvement does not cost individual property owners additional fees or taxes ▪ Improvements may lead to increases in sales and property tax revenue adjacent to redevelopment area	▪ Some risk to Redevelopment Agency if incremental tax revenue does not cover financing costs for improvements ▪ Takes future tax revenue that would otherwise go to the general fund; diverts this revenue to debt service for bonds

1 Note that the formation of a redevelopment agency has been proposed in Martinez but never implemented, and continues to be a topic of debate. Further, the future of redevelopment agencies is in doubt with the Governor's new budget proposal.

Source: Dyett & Bhatia, 2010; City of Martinez Downtown Specific Plan, 2006.

These financing strategies are assessed in relation to the specific sewer, gas, and electric infrastructure improvements required for implementation of future development proposed in the Martinez Downtown Specific Plan.

3.2 Natural Gas and Electric

The need and likely cost associated with projected investment required to support the growth and load changes associated with the Downtown Martinez Specific Plan are minimal – due to existing system investment, conditions and maintenance management by PG&E, there are very low probabilities that new expenditures would be required to support the proposed plan. However, developers will still face connection costs associated with gas and electric service. In this section, we focus on funding programs that are available, the anticipated funding sources for new service connections, and potential funding sources for unanticipated but required undergrounding of electric facilities. Two main funding sources are available to support investment in gas and electric utility requirements outside PG&E's maintenance activities. These are Rule 16 and Rule 20.

UNDERGROUNDING UTILITIES AND RULE 20

Rule 20 supports removing overhead electric lines and providing underground service. Undergrounding accomplishes visual objectives and produces upgraded facilities through the newly located distribution assets. Rule 20 has three components: "A", B" and "C". Rule 20A allows the City to request undergrounding in a specific area, and provides funding to accomplish this. The funding is derived from utility rates and is guided by an intricate set of rules. Accumulation of funding for Rule 20A projects is ongoing, so funding will be available for new projects over time. As indicated in previous Chapters, the City has identified its next Rule 20A project, which will complete undergrounding for almost all non-residential areas within the Downtown Specific Plan. With the several undergrounding projects completed, underway or planned, the only areas within the Downtown Specific Plan that still have overhead service are almost completely residential and are not considered high priority for undergrounding purposes.

PG&E's Rule 20 has two additional provisions that guide how overhead lines would be undergrounded. Rule 20B requires a section of undergrounding of at least 600 feet. Except for sites discussed below, we do not see this condition for sites in the Downtown Specific Plan. Sites that may be exposed to undergrounding are in strictly residential areas and have shorter footages required to obtain service. Since these would not qualify for Rule 20B, any undergrounding would be requested and completed pursuant to Rule 20C. Rule 20C requires the developer or applicant to pay for all non-utility covered costs. The only utility cost support would come through the application of Rule 16 rebates as described below for new service connections.

SERVICE CONNECTIONS AND RULE 16

A second funding facility is PG&E's Rule 16 rebates. Rule 16 guides how PG&E establishes service connections for new service locations. Rule 16 also specifies the construction and cost responsibilities between developers and the utility.[22] It also provides for a fixed dollar amount of rebate for each

[22] The allocation of cost responsibility for new gas and electric facilities to serve new project locations is guided between Rule 15 (for system expansion) and Rule 16 (for new service connections). We do not anticipate the need for Rule 15 system expansion costs for the proposed Downtown Specific Plan development. New service connections are likely for sites that transform usage (e.g. – from commercial to residential) and

new residential meter that is connected and a rebate for commercial and industrial meters based on forecast usage. Together, these rebates help offset the developer's cost of obtaining gas and electric service. Rule 16 rebates will be available for new services required for development projects under the Martinez Downtown Specific Plan.[23]

Two observations about service connections and costs are relevant. First, most of the new development in the Downtown Specific Plan will be residential. As a general matter, Rule 16 rebates cover a significant portion of new service costs. Second, and somewhat related, the Downtown Specific Plan calls for dense residential development, resulting from the large number of multi-family projects anticipated. Dense residential development generally means that the developer will be able to exercise economies of scale with regard to electric and gas connections. In previous studies, AES has found that this results in Rule 16 rebates that usually cover the developer's electric and gas infrastructure costs. With mostly dense residential development, it is expected that Rule 16 rebates would provide significant financial assistance to developers in accomplishing the Downtown Specific Plan.

Overall, between the type of development expected and Rule 16 rebates, it appears that there is only limited exposure to gas and electric service cost issues. These are limited to larger sites and then under conditions of additional requirements for electric system undergrounding.

FUNDING CONSIDERATIONS FOR OPPORTUNITY SITES

There are three sites that provide additional insight into the likely usefulness of both Rule 20 and Rule 16 rebates. They are opportunity sites 3, 4 and 5. These sites are not in the Downtown Core section of the Downtown Specific Plan (which has been effectively undergrounded) and they are located along two streets that have overhead service. Sites 3 and 4 are scheduled to be used for residential development. Site 5 is slated for live/work development, which would result in a combination of residential and commercial meters. All three sites will transition from industrial to residential/light commercial use, which will involve significant site alteration and development investment. Because they will support residential development, they will be eligible for cost reimbursement under Rule 16. Furthermore, given the high density of development, measured as the number of units

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for sites that have multiple meters (e.g. – multi-family unit developments). Rule 16 specifies the cost components for which the developer is responsible and those that are covered by the utility. Rate schedules adopted by PG&E and approved by the California Public Utility Commission speak to this with some degree of specificity. PG&E generally pays for purchasing and installing all conductors, switches, transformers and metering equipment. The developer pays for all engineering, checking, excavation, fill, conduits, boxes and pads for equipment. In addition, the tariffs (under Rule 16) call for reimbursements, based either on residential units connected or non-residential load that will materialize. Although the actual calculation can become complicated (and mired in regulatory cost accounting), the anticipated net affect on development costs are estimated to be either consistent with or below typical connection costs for the development projects anticipated in the Plan.

[23] Rebates are not available for existing meters, but we would not anticipate costs associated with providing service over existing facilities that would require financing assistance.

to be created (272 plus 49 plus 10 (estimated)), the amount of funds reimbursed is likely to completely cover the developer's share of Rule 16 costs. Thus, it is expected that a primary source of funding for the gas and electric infrastructure for these sites is PG&E's Rule 16 refunds.

These sites also may be exposed to additional infrastructure costs (for example, undergrounding along Berrellessa Street). As stated above, this area is not targeted for undergrounding -- however, the City Code does promote it. The City has some discretion on developers' exposure to undergrounding through its application of the City's requirement to underground, where the City Engineer could waive undergrounding requirements under certain conditions. It is observed above that funding for Rule 20A is accumulated on an ongoing basis. Over time, the City could chose this area as an additional Rule 20A project and acquire funding for undergrounding. Using this approach, the City has the ability to manage developers' exposure to undergrounding. If managing the timing of undergrounding projects is not practical, the City might consider creating an internal funding program to assist developer and their costs, for example based on special assessment districts or other funding method. Again, no significant need for this facility is expected in connection with the Downtown Specific Plan.

CONCLUSION

In summary, there is very little need to upgrade gas and electric delivery systems beyond what PG&E has and is expected to continue to do. Thus, no major funding requirements are identified. If undergrounding were identified, Rule 20A would be the first source of funding. However, if the undergrounding project is too small or motivated by other than the City, it will not qualify for Rule 20A, and must be done through Rule 20B or Rule 20C. Either of these paths will require the developer to pay most or all of the undergrounding costs. Further, Rule 16 rebates provide a significant source of funding for obtaining new electric and gas service. Due to the dense residential development, Rule 16 rebates are expected to at least cover connection (Rule 16 costs), and perhaps contribute to other undergrounding requirements as they might develop.

3.3 Sanitary Sewer

The sewer infrastructure is owned and operated by the Central Contra Costa Sanitary District (CCCSD). The CCCSD wastewater collection system includes 1,500 miles of sewer, 18 pump stations and associated force mains. The District provides wastewater collection, transport and treatment for Danville, Lafayette, Moraga, Orinda, Pleasant Hill, and Walnut Creek with portions of Martinez.[24] Currently, CCCSD funds its Capital Improvement Program through a variety of sources, including facility capacity fees, pumped zone fees, interest, property taxes, sewer service charges, and reimbursements from others.[25] As noted above, the CCCSD CIP includes the Martinez Alhambra Avenue Trunks expansion in Alhambra Avenue from Highway 4 to C Street, planned to begin implementation in 2017.

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[24] Central Contra Costa Sanitary District Final Report Collection System Master Plan Update, dated May 2010

[25] Central Contra Costa Sanitary District FY 2010-11 Capital Improvement Budget.

REQUIRED IMPROVEMENTS

If the Martinez Alhambra Avenue Sewer Trunks expansion is completed in advance of new development, capacity issues on Main and on Alhambra will be relieved. If, however, development occurs in advance of the Alhambra Avenue expansion, the improvements outlined in Chapter 2 would need to be addressed. Similarly, Foster Street can avoid upsizing if sewer flow from the proposed 272 multi-family unit can be diverted to the 27" sewer line in Berrellesa Street. If, however, the project requires use of the Foster Street line, the upgrades outlined in Chapter 2 would need to be addressed.

The financing strategy outlined below assumes that either new development occurs prior to the Alhambra Avenue expansions and requires the upgrade at an earlier date, or new development makes use of the Foster Street line rather than diverting to Berrellesa Street. In order for the downtown area to accommodate the increase in sewer demand, the funds to upsize the sewer pipes would need to come from somewhere. Because the improvements would be required specifically for new development, a fair share financing method would be appropriate. At the same time, in order to attract developers to the downtown area, the City must implement financial approaches that reduce risk and financial outlay by developers, many of whom are already struggling in a weak economy.

FINANCING STRATEGIES

The City and CCCSD would need to facilitate infrastructure improvements required by developers in two circumstances to implement the Downtown Specific Plan:

1. To promote development that would impact the Alhambra Avenue Trunk line in advance of the Alhambra Avenue Trunks expansion (planned for 2017), thereby requiring improvements on Main Street or Alhambra Avenue between Escobar and Susana streets; or

2. To promote development on opportunity site 3, if development requires use of sewer infrastructure on Foster Street.

Because the supplemental infrastructure would be completed primarily to serve the specific development, it would be appropriate for the developer to bear the costs; however, because the resulting infrastructure would ultimately serve as improved infrastructure for the City, a reimbursement program is also recommended. This would reduce the cost and risk to the developer and help promote development in the Downtown area.

In order to reimburse the developer, the City may use any of the following methods:

- ***Developer impact fees***. Impact fees from developers could be implemented through the application process, based on a cost structure that would be prepared by CCCSD. However, if development does not occur at the anticipated density or result in achieve the anticipated tax revenue; a portion of cost incurred by CCCSD may remain unfunded. This approach is also supported by Measure J.

- ***Tax increment financing***. This option would require the City to establish a redevelopment agency, which has been proposed in Martinez but never implemented, and continues to be a

topic of debate. Further, the future of redevelopment agencies is in doubt with the Governor's new budget proposal. In the case that the redevelopment agency is formed and tax increment financing employed, this option may result in risk to the redevelopment agency, in the case that tax revenues are not sufficient to cover the costs.

- ***Establishment of an assessment district***. Voter approval is required to establish an assessment district. This option would then require additional taxes and fees paid by property owners in the assessment district. Barriers to this method include lack of support by property owners and the need for voter approval.

Alternatively, the City may fund the improvements following the establishment of an assessment district, infrastructure financing district, or redevelopment area.

3.4 Additional Funding Sources

Several state and federal funding sources exist that could potentially help support the provision of infrastructure improvements that would support the implementation of the Martinez Downtown Specific Plan.

California Infrastructure and Economic Development Bank (I-Bank)

The California Infrastructure and Economic Development Bank (I-Bank) was created in 1994 to promote economic revitalization, enable future development, and encourage a healthy climate for jobs in California. The I-Bank operates pursuant to the contained in the California Government Code Sections 63000 et seq. The I-Bank has authority to issue tax-exempt and taxable revenue bonds, provide financing to public agencies, provide credit enhancements, acquire or lease facilities, and leverage State and Federal funds. The most relevant I-Bank program is the Infrastructure State Revolving Fund (ISRF) Program, which provides low-cost financing to public agencies for a wide variety of infrastructure projects. ISRF Program funding is available in amounts ranging from $250,000 to $10,000,000, with terms of up to 30 years. Interest rates are fixed for the term of the financing;

http://www.ibank.ca.gov/

Clean Water State Revolving Fund

Under Title VI of the 1987 Clean Water Act, states receive federal monies to capitalize Clean Water State Revolving Fund (CWSRF) loan programs. Through CWSRF programs, loans are made to communities to provide low cost financing for a wide range of different projects for the protection of water quality. The California CWSRF provides financial assistance for the construction of facilities or implementation of measures necessary to address water quality problems and to prevent pollution. The program is funded by federal grants, State funds, and Revenue Bonds with financing of up to $50 million. Relevant eligible projects include construction of publicly owned facilities such as local sewers, sewer interceptors, and water reclamation facilities.

http://www.swrcb.ca.gov/water_issues/programs/grants_loans/srf/

http://water.epa.gov/grants_funding/cwf/cwsrf_index.cfm

Safe Drinking Water State Revolving Fund

The California Safe Drinking Water State Revolving Fund, operated by the California Department of Public Health, provides funding to correct public water system deficiencies based upon a prioritized funding approach that addresses the systems' problems that pose public health risks, systems with needs for funding to comply with requirements of the Safe Drinking Water Act, and systems most in need on a per household affordability basis.

http://www.cdph.ca.gov/services/funding/Pages/SRF.aspx

California Energy Commission

The California Energy Commission received $314.5 million from the American Recovery and Reinvestment Act for energy efficiency and renewable energy programs. The Energy Commission is administering four programs: the State Energy Program ($226 million), the Energy Efficiency Conservation Block Grant Program ($49.6 million), Appliance Rebate Program ($35.2 million), and Energy Assurance Planning ($3.6 million).

http://www.energy.ca.gov/recovery/

California Department of Housing and Community Development Loans, Grants and Programs

The California Department of Housing and Community Development operates a number of loan, grant, and other programs for the construction, acquisition, rehabilitation and preservation of affordable rental and ownership housing, homeless shelters and transitional housing, public facilities and infrastructure, and the development of jobs for lower income workers. Both the American Recovery and Reinvestment Act Community Development Block Grant Recovery Program and the Infill Infrastructure Grant Program could potentially support infrastructure improvements related to infill development and downtown revitalization.

http://www.hcd.ca.gov/fa/

4 Technology and Sustainability Review

This Chapter provides an overview of technology, sustainable design practices, and policies for reducing electric, gas, and sanitary sewer demands. Sections 4-1 and 4-2 provide an overview of technology and sustainable design practices. Section 4-3 provides an overview of relevant strategies from the City of Martinez Climate Action Plan and model policies from other sources that could be tailored and integrated into the City's General Plan.

4.1 Natural Gas and Electric

Sustainability of energy use may take three forms: efficiency of usage; conservation of usage; and on-site production of renewable energy or that takes advantage of combined heat and power. This section provides highlights of these three forms.

ENERGY EFFICIENCY

Efficiency of energy use has the objective of getting as much value (work) out of the energy that is used as is possible. In the context of the Downtown Specific Plan, which is focused on developing new buildings on identified sites, this objective will be guided by two predominant, institutional sources. The first is the building standards that will be applied to new buildings, called Title 24 Building Standards. Title 24 has standards for residential and non-residential construction. Buildings must meet Title 24 standards as a requirement for final permits. Beyond Title 24 are the LEED performance standards.[26] LEED has three levels of attaining energy efficiency: silver, gold and platinum, with increasingly aggressive measures required for attainment. Participation in LEED is completely voluntary by the developer, and usually will increase the capital cost of a new building. The benefits of reduced energy and therefore reduced operating costs of the buildings are site-specific. In support of energy efficiency and LEED, there are many architect and engineering firms that specialize in energy efficiency and LEED attainment.[27]

Overall, energy efficiency rests in the choice of building design and materials and in the components that use energy within the building (such as lighting, heating and air conditioning (HVAC) units, and so forth). Technology is always evolving – air conditioners become more efficient, lighting by LED is beginning to be commercialized for more applications, and so forth. The magnitude

[26] LEED stands for Leadership in Energy and Environmental Design. Interested persons can look at the US Green Building Council website for an extensive discussion on what LEED is and How it works at: http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1970

[27] A publically oriented source for the interested reader is the California Center for Sustainable Energy (CCSE).

and impact of energy efficiency (beyond the Title 24 standards) are typically subject to the developer unless local building codes and zoning changes are implemented.

ENERGY CONSERVATION

Energy conservation is similar to energy efficiency, with the express objective of reducing energy consumption. Conservation measures range from passive technologies (e.g. – weather stripping and insulation) to active (such as changing when energy is used during the day in response to peak price programs). Active energy conservation requires user response to conservation options. The technologies may range from simple on-off switches (to reduce consumption during peak price periods) to sophisticated energy management systems. Most energy conservation choices (beyond those required by Title 24) are motivated by their economics – they must save enough in energy costs to support the cost of installing them. However, some fit with LEED projects that may be bundled with an entire package of strategies, and others might fit the developer's business or environmental model of development. The California Center for Sustainable Energy (CCSE) website has considerable information on energy conservation strategies.

ON-SITE PRODUCTION

On-site production of energy that fits the sustainability model falls into two categories: renewable generation and combined heat and power. Renewable energy generation technologies include solar and wind generation. Integrating solar generation into new buildings is becoming more and more common. Solar photovoltaic technologies have been evolving to meet this opportunity, including uses of "thin film" solar, solar integrated into roofing product, and mounting systems built into the original design of the building. Integrating solar generation in projects within the Downtown Specific Plan is technically feasible and may be attractive to the developer. The extent to which this happens will likely be a matter of economics and marketing models that developers are considering. The economics of renewable energy are significantly affected by government subsidy programs, which will be discussed below.

Wind generation for on-site use is less common than solar generation. This is generally because the size requirements of wind are significantly greater and the visual and audible impacts are not consistent with more dense development projects. Wind is a very unlikely option for the Downtown Specific Plan area.

Combined heat and power (CHP) is an option as long as the heat can be used in the project. Residential projects do use heat for space conditioning and water heating. However, these uses are not very constant over the course of a day and do not fit well with traditional CHP designs. Because of their relatively small size, the loads for both heat and electricity make CHP an unlikely fit for any specific site within the Downtown Specific Plan area. Aggregating sites so that they might support CHP would be a project in and of itself, and other than observing its unlikely potential, is beyond the scope of this study.

SUSTAINABLE TECHNOLOGIES FUNDING

Funding for sustainable technologies is available through several sources. First, for conservation and efficiency technologies, PG&E has a program called "Savings by Design." This program pro-

vides up to $500,000 per building for benefits that are attained, measured as reduced energy consumption compared to projected Title 24 base-line consumption levels. PG&E works with developers on new projects to define the efficiency and conservation strategies and how they are modeled (based on accepted building performance models). If the design reflects savings it is eligible for Savings By Design reimbursement upon commissioning.[28]

Renewable energy technologies also have funding resources in the form of federal and state tax incentives. For instance, there is a 30 percent federal investment tax credit available for solar generating projects. In addition, the state of California has the "California Solar Initiative" program. This program has a decreasing incentive payment structure and may or may not be available over the longer term. For now, it supports approximately a 15 percent reimbursement of cost. There are federal and state incentives for other renewable energy generation, specific to the technology and end-use of the projects.

In summary, there are several motivations and incentives for sustainable energy use that can be implemented in the Downtown Specific Plan. Almost all of them revolve around the economic results of the project and are implemented at the discretion of the developer. Federal and State incentive plans are currently available, but their long-run availability is not assured.

4.2 Sanitary Sewer

This section outlines and reviews two different design practices to reduce sanitary sewer demands for the development of the downtown area. Reducing sewer demands would be beneficial to relieving pipe capacity issues that currently exist within portions of the sewer infrastructure.

WATER CONSERVATION

The use of water conserving plumbing fixtures could be used to reduce sanitary sewer demand. Examples of ways to use water conserving plumbing fixtures are:

- Use of 0.5 gal/flush urinals (compared to the conventional 1.0 gal/flush) in new commercial projects.
- Use of 1.28 gal/flush toilets (compared to the conventional 1.6 gal/flush).
- Use of sub-metering in multi-family units.
- Offer efficient clothes washer rebates in residential multi-family units.

For more aggressive water conservation, plumbing fixtures such as waterless urinal, automatic sinks and dual plumbing for potable and recycled water are other ways to reduce potable water demand.

[28] PG&E also incentivizes the "design team" (architects and engineers, etc.) by paying them 10 percent of the award in addition to the actual award.

The uses of water conserving plumbing fixtures can provide economical and environmental benefits for developers and the City:

- Decreases building operation costs.
- Decreases capital investment needed for water supply, thereby leading to more stable municipal taxes and water fees.
- Decreases the amount of water withdrawn from nearby water bodies, thereby protecting the natural water cycle and saving water resources for future generations.
- Reduces chemical inputs at the water treatment plants, as well as reduces energy use and any associated greenhouse gas emissions for treatment and distribution.
- Decreases sewer generation into Central Contra Costa Sanitary District sewer conveyance system.

Portions of the existing sewer infrastructure in the downtown area currently have pipe capacity issues due to sewer lines upstream of the downtown area. New development that is outlined in the Martinez Downtown Specific Plan will only continue to burden the existing sewer infrastructure if the infrastructure is not upsized to handle the existing and future sewer demands. Developments using water conserving plumbing fixtures will not solve the existing pipe capacity sewer issues, but could provide economical and environmental benefits for developers and the City.

WASTEWATER TREATMENT ON-SITE

For more innovative ways to reduce sanitary sewer demand on the existing sewer infrastructure, on-site wastewater treatment is another approach that could be implemented by developers. Under this scenario, wastewater would be treated to tertiary standards and then reused on-site for non-potable water demands such as irrigation and toilet flushing. This would reduce wastewater discharge from the site and would also reduce domestic water demands. On-site wastewater treatment would help developers with several Water Efficiency* LEED[29] credits including:

Credit	*Title*
WE Prerequisite 1	Water Use Reduction
WE Credit 2	Innovative Wastewater Technologies
WE Credit 3	Water Use Reduction

*WE Credit 1 - Water Efficient Landscaping is not included as part of the design practices for reducing sanitary sewer demands

However, developers would need to explore and investigate if this on-site wastewater treatment is feasible and/or economical for their project.

[29] *LEED Reference Guide for Green Building Design and Construction – 2009 Edition*

4.3 Model Policies

MARTINEZ CLIMATE ACTION PLAN ENERGY STRATEGIES

The Martinez Climate Action Plan (CAP)[30] includes several strategies relevant to energy efficiency and conservation, on-site energy production, and water conservation. Policies that build on these strategies should be incorporated into the General Plan to ensure implementation of the Specific Plan in a sustainable manner.

Program E1: Martinez Green Building Standards

In order to reduce energy demand and use, the CAP recommends that the City implement tighter building codes and an appropriate building scale checklist based on LEED rating systems and GreenPoint, at the site and neighborhood scale. The CAP also recommends that the City adopt the Title 24 voluntary green building standards for nonresidential construction and green building standards ahead of the scheduled effective dates in 2010. Since the publication of the CAP, the 2010 California Green Building Standards have been adopted as mandatory provisions.[31] However, the City may still consider even more rigorous codes in anticipation of future requirements becoming more stringent.

Benefits of this program include more sustainable buildings, reduced energy consumption, decreased costs for residents and businesses, and a potential emissions reduction of one to ten percent of the Community Energy Category. Development of sustainable buildings and reduced energy consumption could help establish the Downtown as a model of sustainable development in addition to reducing demand for gas and electric infrastructure. The CAP estimated that costs for this program would be minimal and limited to City staff time.

Resources:

- Title 24 Green Building Standards Code. More information at: http://www.documents.dgs.ca.gov/bsc/2009/part11_2008_calgreen_code.pdf
- U.S. Green Building Council. http://www.usgbc.org/DisplayPage.aspx?CategoryID=19

Program E2: Energy Efficiency and Rebate Program

In order to reduce energy demand and use, the CAP recommends that the City promote energy efficiency programs and rebate opportunities, including opportunities for residential and commercial solar retrofitting, and evaluate and consider potential discounts for energy efficient retrofits. The City would promote services, rebates, and tax incentives for energy conservation and renewable energy. This would include services provided by the East Bay Energy Watch Partnership and PG&E to reduce energy use for commercial, residential and municipal facilities. The City would

[30] City of Martinez Climate Action Plan, June 2009.

[31] California Building Standards Commission, California Code of Regulations, Title 24, Part 11, effective January 2010.

organize local outreach events and provide programmatic information, services, and rebates through the City's website and outreach materials. Outreach materials would be distributed to businesses and made available through City offices and media outlets to increase awareness of the programs. The City would continue to gather and distribute the most up-to-date information about energy efficiency programs, rebate opportunities, and tax incentives to residents and businesses.

Benefits of this program would include reduced energy consumption and carbon footprints for residents, organizations and businesses (including a decrease in utility bills). Potential reductions would be two to ten percent of the Community Energy Category. Increased awareness of programs would promote development of sustainable buildings and reduced energy consumption, and would help establish the Downtown as a model of sustainable development in addition to reducing demand for gas and electric infrastructure. The CAP estimated that costs would be minimal and limited to City staff time. Further, federal stimulus funds may also be available through the Energy Efficiency and Conservation Block Grant (EECBG) Program to support energy audits and energy efficiency retrofits in residential and commercial buildings.

Resources:

- 2009 East Bay Energy Watch Partnership. More information at: http://www.pge.com/energywatch/
- PG&E Business Programs & Rebates. More information at: http://www.pge.com/mybusiness/energysavingsrebates/
- PG&E Residential Programs & Rebates. http://www.pge.com/myhome/saveenergymoney/rebates/
- PG&E 2009 Non-residential Retrofit – Demand Response (NRR-DR) Program. http://www.pge.com/mybusiness/energysavingsrebates/resources/otherprograms/incentiveppli cationnrrdr/
- PG&E Retrocommissioning Program (Large Commercial). http://www.pge.com/mybusiness/energysavingsrebates/analyzer/retrocommissioning/

Program E3: Greening and Streamlining the Permit Process

In order to reduce energy demand and use, the CAP recommends that the City expedite green permits and include outreach materials in all permit applications. As part of this program, the City would develop a permit process that would encourage and facilitate green building and renewable energy projects. The City would develop simplified or assisted permitting procedures for obtaining the necessary approvals for projects that exceed the new State standards for green building (LEED gold or platinum), for green remodels and retrofits, for adaptive re-use of existing buildings, for renewable energy system development, or equivalent. The process would establish the understanding that renewable energy and green building projects are supported by the City, and ensure there are few institutional barriers.

Benefits of this program would include more rapid adoption of green building materials and methods, and of renewable energy systems, resulting in reduced GHG emissions, reduced energy con-

sumption, and lower power costs. Potential emissions reductions would be two to five percent of the Total Energy Category. This program would work well to promote sustainable development under the City of Martinez Downtown Specific Plan. The CAP estimated that costs would be minimal and limited to City staff time to develop and implement the program.

Resources:

A summary of solar permit fees in Northern California and how municipalities are most effectively promoting solar energy through the permit process can be found at: http://lomaprieta.sierraclub.org/global_warming/pv_permit_study.htm#Why_Cities_Require_Solar_Permits

Program E5: Martinez Is Renewable

Description:

In order to promote on-site renewable energy generation, the CAP recommends the City consider use of on-site renewable energy for municipal operations and promote availability of renewable energy. In this program, the City would lead by example and install a small-scale renewable energy system, such as a solar rooftop system. The City would thereby demonstrate its commitment to on-site renewable energy generation. The installation would be used as a promotion for residents & businesses to consider on-site generation for their electricity needs. Information on state and federal incentives and tax credits would also be included in the promotional program.

Benefits of this program would include demonstration of City leadership and commitment to renewable energy. The program would result in decreased energy bills for the City and encourage residents to implement on-site renewable energy projects. Further, potential emissions reductions would be one to ten percent of the Total Energy Category. The CAP estimated that a solar installation and outreach materials could total 50k, but would then also offset the City's energy costs. Additional considerations are that the monthly financing of a solar installation may be comparable to a monthly energy bill from PG&E. The City could solicit discounted bids from solar contractors in exchange for advertising to Martinez residents. Further, federal stimulus funds may also be available for installing renewable energy technologies on government buildings through the Energy Efficiency and Conservation Block Grant (EECBG) Program.

Resources:

- Solar Sebastopol – An example of a Municipal commitment and success story to solar energy. http://www.solarsebastopol.com/
- Berkeley First Solar Initiative is a municipal financing program to make solar installations more affordable and accessible. http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=26580

Program W1: Promote Water Conservation

Description:

In order to reduce water demand and increase efficiencies, the CAP recommends that the City continue to promote water conservation through various community outreach programs and activities. This program would build on existing efforts by the City's Public Works Department, Contra Costa

Water District, and state agencies to encourage and facilitate residents and businesses to conserve water.

The CAP describes benefits of the program as reducing water demand and consumption, reducing energy consumption, and reducing greenhouse gas emissions associated with water system operations. Potential emissions reductions would be ten to twenty percent of the Community Water Category. The CAP estimates that costs would be ongoing for public outreach and incentives for water conservation retrofits. The City already has an active water conservation outreach program, as does Contra Costa Water District, that this program would augment.

Resources:

- City of Martinez Water System: www.cityofmartinez.org/depts/public_works/water.asp
- Contra Costa Water District water conservation programs: www.ccwater.com/conserve/
- California Department of Water Resources: www.water.ca.gov/

OTHER MODEL POLICIES

Several State agencies and Bay Area municipalities have developed policies that aim to increase energy and water efficiency and conservation, on-site energy production, and on-site water treatment and reuse. Several of these policies build on the strategies outlined in the City of Martinez CAP. Sample polices that could be tailored and integrated into the City's General Plan are included here, drawing from the California Air Pollution Control Officers Association (CAPCOA),[32] the City of Emeryville,[33] and the City of San Jose.[34] General Plan policies should include specific details regarding implementation and timeframe. These types of policies would ensure that the Downtown Specific Plan is implemented in an energy and water efficient manner, thereby reducing impacts to the infrastructure network.

CAPCOA Model Policies

Energy Efficiency Policies

Goal: Reduce emissions from the generation of electricity by reducing electricity use through increased efficiency.

Objective EE-1 The City/County will establish green building requirements and standards for new development and redevelopment projects, and will work to provide incentives for green building practices and remove barriers that impede their use.

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[32] California Air Pollution Control Officers Association (CAPCOA), Model Policies for Greenhouse Gases in General Plans: A Resource for Local Government, June 2009.

[33] City of Emeryville General Plan, October 2009, amended January 2010.

[34] City of San Jose Draft General Plan, December, 2010.

http://www.sanjoseca.gov/planning/gp_update/draftplan.asp

- **EE-1.1 Green Building Ordinance:** The City/County will adopt a Green Building Ordinance that requires new development and redevelopment projects for both residential and commercial buildings to incorporate sufficient green building methods and techniques to qualify for the equivalent of a current LEED Certified rating, GreenPoints, or equivalent rating system.

- **EE-1.2 Green Building Flexibility:** The City/County will allow increased height limits and/or flexibility in other standards for projects that incorporate energy efficient green building practices.

- **EE-1.3 Green Building Barriers:** The City/County will identify and remove regulatory or procedural barriers to implementing green building practices within its jurisdiction, such as updating codes, guidelines, and zoning, and will ensure that all plan review and building inspection staff are trained in green building materials, practices, and techniques.

- **EE-1.4 Green Building Incentives:** The City/County will support the use of green building practices by:

    - **1.4.1** Providing information, marketing, training, and technical assistance about green building practices;

    - **1.4.2** Establishing guidelines for green building practices in residential and commercial development;

    - **1.4.3** Providing financial incentives, including reduction in development fees, administrative fees, and expedited permit processing for projects that use green building practices.

Objective EE-2 The City/County will establish policies and standards to increase energy efficiency at new developments.

- **EE-2.1 Improved Building Standards:** The City/County will adopt energy efficiency performance standards for buildings that achieve a greater reduction in energy and water use than otherwise required by state law, including:

    - **2.1.1** Standards for the installation of "cool roofs";

    - **2.1.2** Performance standards for heat transfer across the building envelope that result in increased insulation and the use of lowemissive windows;

    - **2.1.3** Requirements to install high-efficiency plumbing fixtures and tankless water heaters;

    - **2.1.4** Performance standards that specify high-efficiency space heating and cooling systems;

    - **2.1.5** Requirements for improved overall efficiency of lighting systems;

    - **2.1.6** Requirements for the use of Energy Star® appliances and fixtures in discretionary new development;

    - **2.1.7** New lots shall be arranged and oriented to maximize effective use of passive solar energy.

- **EE-2.2 Affordable Housing Energy Efficiency:** Affordable housing development shall incorporate energy efficient design and features to the maximum extent feasible.

    - **2.2.1** The City/County will target local funds, including redevelopment and community development block grant resources, to assist affordable housing developers in meeting the energy efficiency requirements.

- **EE-2.3 Outdoor Lighting:** The City/County will establish outdoor lighting standards in the Zoning Ordinance, including:

    - **2.3.1** Requirements that all outdoor lighting fixtures be energy efficient, such as:
        - **2.3.1.1** Full cut-off light fixtures at parking lots and on buildings;
        - **2.3.1.2** Photocells or astronomical time switches on all permanently installed exterior lighting;
        - **2.3.1.3** Directional and shielded LED lights for exterior lighting *(for example, see: www.nightwise.org)*, and install exterior and security lights with motion detectors.
    - **2.3.2** Requirements that light levels in all new development, parking lots, and street lighting not exceed state standards.

- **EE-2.4 Residential Wood Burning:** The City/County will establish or enhance local ordinances that prohibit solid fuel wood-burning devices in mixed-use high-density development and restrict the installation of wood-burning appliances in new or redeveloped single family residential properties to those that burn pellets, natural gas, or propane, or at a minimum, EPA certified wood-burning units.

Objective EE-4: The City/County will pursue policies and programs to improve energy efficiency of existing buildings.

- **EE-4.1 Energy Audits:** The City/County will require the performance of energy audits for residential and commercial buildings prior to completion of sale, and that audit results and information about opportunities for energy efficiency improvements be presented to the buyer.

- **EE-4.2 Energy Efficiency Funding:** The City/County will pursue incentives, grants, and creative financing for projects that improve energy efficiency, including, for example, the option for property owners to pay for such improvements through long-term assessments on their property tax bills.

- **EE-4.3 Community Energy Program:** The City/County will implement an outreach and incentive program to promote energy efficiency and conservation in the community, including:

    - **4.3.1** Launch an "energy efficiency challenge" campaign for community residents;

- **4.3.2** Implement a low-income weatherization assistance program;
- **4.3.3** Implement conservation campaigns specifically targeted to residents, and separately to businesses;
- **4.3.4** Promote the purchase of Energy Star® appliances, including, where feasible, incentive grants and vouchers;
- **4.3.5** Promote participation in the local "Green Business" program;
- **4.3.6** Distribute free CFL bulbs or other efficiency fixtures to community members;
- **4.3.7** Offer exchange programs for high-energy-use items, such as halogen torchiere lamps;
- **4.3.8** Adopt an ordinance requiring energy upgrades at time of property sale.

Alternative Energy Policies

Goal: The City/County will seek to reduce emissions associated with electrical generation by promoting and supporting the generation and use of alternative energy.

Objective AE-1: The City/County will establish policies and programs that facilitate the siting of new renewable energy generation.

- **AE-1.1 Site Designation:** The City/County will identify possible sites for production of renewable energy (such as solar, wind, small hydro, and biogas), as compatible with surrounding uses, and will protect and promote that use, including:
    - **1.1.1** Designate suitable sites to prioritize their development for renewable energy generation;
    - **1.1.2** Evaluate potential land use, environmental, economic, and other constraints on that use, and mitigate such constraints, as feasible;
    - **1.1.3** Adopt measures to protect the renewable energy use of the sites and their resources, such as utility easements, rights-of-way, and land setasides.
- **AE-1.2 Removing Barriers:** The City/County will identify and remove or otherwise address barriers to renewable energy production, including:
    - **1.2.1** Review and revise building and development codes, design guidelines, and zoning ordinances to remove such barriers;
    - **1.2.2** Work with related agencies, such as fire, water, health and others that may have policies or requirements that adversely impact the development or use of renewable energy technologies;

    - **1.2.3** Develop protocols for safe storage of renewable and alternative energy products with the potential to leak, ignite or explode, such as biodiesel, hydrogen, and/or compressed air.

- **AE-1.3 Zoning Flexibility:** The City/County will allow renewable energy projects in areas zoned for open space, where consistent with the Open Space element, and other uses and values.

Objective AE-2 The City/County will promote and require renewable energy generation, and co-generation projects where feasible and appropriate.

- **AE-2.1 On-site Renewable Energy Generation:** The City/County will require that new office/retail/commercial or industrial development, or major rehabilitation (e.g., additions of 25,000 square feet commercial, or 100,000 square feet industrial) incorporate renewable energy generation either on- or off-site to provide 15% or more of the project's energy needs.

- **AE-2.2 Co-generation Projects:** The City/County will promote and encourage cogeneration projects for commercial and industrial facilities, provided they meet all applicable air quality standards and provide a net reduction in GHG emissions associated with energy production.

- **AE-2.3 Green Utilities:** The City/County will promote and support green utilities, and will evaluate the creation of a locally or regionally owned green utility, perhaps in coordination with other regional strategies.

Objective AE-3: The City/County will promote, support, and require, as appropriate, the development of solar energy.

- **AE-3.1 Solar-ready Buildings:** The City/County will require that, where feasible, all new buildings be constructed to allow for easy, cost-effective installation of solar energy systems in the future, using such "solar-ready" features as:

    - **3.1.1** Designing the building to include optimal roof orientation (between 20 to 55 degrees from the horizontal), with sufficient south-sloped roof surface;

    - **3.1.2** Clear access without obstructions (chimneys, heating and plumbing vents, etc.) on the south sloped roof;

    - **3.1.3** Designing the roof framing to support the addition of solar panels;

    - **3.1.4** Installation of electrical conduit to accept solar electric system wiring;

    - **3.1.5** Installation of plumbing to support a solar hot water system and provision of space for a solar hot water storage tank.

- **AE-3.2 Solar Homes Partnership:** The City/County will require that residential projects of 6 units or more participate in the California Energy Commission's New Solar Homes Partnership, which provides rebates to developers who offer solar power in at least 50% of new units, or a program with similar provisions.

- **AE-3.3 Passive Solar Design:** The City/County will require that any building constructed in whole or in part with City/County funds incorporate passive solar design features, such as daylighting and passive solar heating, where feasible.

- **AE-3.4 Protection of Solar Elements:** The City/County will protect active and passive solar design elements and systems from shading by neighboring structures and trees, as consistent with existing tree shading requirements.

Objective AE-4: The City/County will pursue and provide economic incentives and creative financing for renewable energy projects, as well as other support for community members or developers seeking funding for such projects.

- **AE-4.1 Renewable Energy Incentives**: The City/County will provide, where possible, grants, rebates, and incentives for renewable energy projects, including reduced fees and expedited permit processing.

- **AE-4.2 Creative Financing**: The City/County will provide, where feasible, creative financing for renewable energy projects, including subsidized or other low-interest loans, and the option to pay for system installation through long-term assessments on individual property tax bills.

- **AE-4.3 Partnerships**: The City/County will pursue partnerships with other governmental entities and with private companies and utilities to establish incentive programs for renewable energy.

- **AE-4.4 Information and Support**: The City/County will establish and maintain a clearinghouse of information on available funding alternatives for renewable energy projects, rates of return, and other information to support developers and community members interested in pursuing renewable energy projects.

Objective AE-5: The City/County will implement measures to support the purchase and use of renewable and alternative energy.

- **AE-5.1 Green Electricity Purchasing**: The City/County will establish targets for the purchase of renewable energy, in excess of the state Renewable Portfolio Standards, using such mechanisms as green tags or renewable energy certificates.

- **AE-5.2 Community Choice Aggregation**: The City/County will evaluate the feasibility and effectiveness of using Community Choice Aggregation as a model for providing renewable energy to meet the community's electricity needs, including potential partnerships with other jurisdictions.

Conservation and Open Space Policies

Goal: Conserve natural resources such as water and open space to minimize energy used and GHG emissions and to preserve and promote the ability of such resources to remove carbon from the atmosphere.

Objective COS-1: The City/County will adopt and implement a comprehensive strategy to increase water conservation and the use of recycled water.

- **COS-1.1 Water Consumption Reduction Target**: The City/County will reduce per capita water consumption by X% by 2020.
- **COS-1.3 Recycled Water Use:** The City/County will establish programs and policies to increase the use of recycled water, including:
    - 1.3.1 Create an inventory of non-potable water uses within the jurisdiction that could be served with recycled water;
    - 1.3.2 Produce and promote the use of recycled water for agricultural, industrial, and irrigation purposes, including grey water systems for residential irrigation;
    - 1.3.3 Produce and promote the use of treated, recycled water for potable uses where GHG emissions from producing such water are lower than from other potable sources.
- **COS-1.4 Water Conservation Outreach**: The City/County will implement a public education and outreach campaign to promote water conservation, and will highlight specific water-wasting activities to discourage, such as the watering of non-vegetated surfaces and using water to clean sidewalks and driveways.

Objective COS-2: The City/County will ensure that building standards and permit approval processes promote and support water conservation.

- **COS-2.1 Water-Efficient Design**: The City/County will establish building design guidelines and criteria to promote water-efficient building design, including minimizing the amount of non-roof impervious surfaces around the building(s).
- **COS-2.2 Water-Efficient Infrastructure and Technology**: The City/County will establish menus and check-lists for developers and contractors to ensure water-efficient infrastructure and technology are used in new construction, including low-flow toilets and shower heads, moisture-sensing irrigation, and other such advances.
- **COS-2.3 Gray Water System Standards**: The City/County will establish criteria and standards to permit the safe and effective use of gray water (on-site water recycling), and will review and appropriately revise, without compromising health and safety, other building code requirements that might prevent the use of such systems.

Emeryville General Plan

- **ST-G-6** Energy conservation—Fifty percent reduction in energy consumption for all sectors—transportation, industrial/commercial, residential, and waste, over 2008 levels, by 2017.
- **ST-P-1** The City shall maintain a Climate Action Plan to achieve energy efficiency and conservation goals.

- **ST-P-6** The City shall collaborate with residents, businesses, and other members of the community, including architects, builders and contractors, to encourage private development within the City to use green building methods and practices and to achieve standards set by LEED™ for commercial buildings and the Alameda County Residential Green Building Guidelines for residential projects.

- **ST-P-8** The City shall establish incentives for energy retrofits to support implementation of photovoltaic and other renewable energy technologies that result in an energy savings of at least 20 percent when compared to consumption that would occur with traditional energy sources.

- **CSN-G-3 Water quality and conservation** – High-quality ground water and surface water resources. Improved water conservation, increased use of recycled water, and reduced per capita water consumption.

- **CSN-P-12** The City promotes use of recycled water on landscaping and other non-food source plantings.

- **CSN-P-15** The City shall consider revising plumbing and building code requirements, as necessary, to allow for graywater and rainwater harvesting systems.

- **CSN-P-16** The City will continue to support the use of recycled water in new and rehabilitation projects, through the development process

- **CSN-P-17** The City supports public education initiatives to encourage conservation of potable water.

San Jose General Plan Update

Goal MS-2 – Energy Conservation and Renewable Energy Use

Maximize the use of green building practices in new and existing development to maximize energy efficiency and conservation and to maximize the use of renewable energy sources.

Policies – Energy Conservation and Renewable Energy Use

- MS-2.1 Develop and maintain policies, zoning regulations, and guidelines that require energy conservation and use of renewable energy sources.

- MS-2.2 Maximize use of on-site generation of renewable energy for all new and existing buildings.

- MS-2.3 Utilize solar orientation, including building placement, landscaping, design and construction techniques for new construction to minimize energy consumption.

- MS-2.4 Promote energy efficient construction industry practices.

- MS-2.5 Encourage responsible forest management in wood material selections and encourage the use of rapidly renewable materials.

- MS-2.6 Promote roofing design and surface treatments that reduce the heat island effect of new and existing development.

- MS-2.7 Encourage the installation of solar panels or other clean energy power generation sources over parking areas.

Actions – Energy Conservation and Renewable Energy Use

- MS-2.9 Develop, implement, and utilize programs that help businesses and homeowners improve the energy efficiency of new and existing buildings.

- MS-2.11 Require new development to incorporate green building practices, including those required by the Green Building Ordinance, that reduce energy use through construction techniques (e.g., design of building envelopes and systems to maximize energy performance), through architectural design (e.g. design to maximize cross ventilation and interior daylight) and through site design techniques (e.g. orienting buildings on sites to maximize the effectiveness of passive solar design).

- MS-2.12 Update the Green Building Ordinance to require use of energy efficient plumbing fixtures and appliances that are WaterSense certified, Energy Star rated, or equivalent in new construction and renovation projects.

Goal MS-14 – Reduce Consumption and Increase Efficiency

Reduce per capita energy consumption by at least 50% compared to 2008 levels by 2022 and maintain or reduce net aggregate energy consumption levels equivalent to the 2022 (Green Vision) level through 2040.

Policies – Reduce Consumption and Increase Efficiency

- MS-14.3 Consistent with the California Public Utilities Commission's California Long Term Energy Efficiency Strategic Plan, as revised and as technological advances make it feasible, require all new residential construction to be designed for zero net energy use by 2020 and all new commercial construction to be designed for zero net energy use by 2030.

- MS-14.4 Implement the City's Green Building Policies (see Green Building Section) so that new construction and rehabilitation of existing buildings fully implements industry best practices, including the use of optimized energy systems, selection of materials and resources, water efficiency, sustainable site selection, and passive solar building design.

- MS-14.5 Consistent with State and Federal policies and best practices, require energy efficiency audits and retrofits prior to or at the same time as consideration of solar electric improvements.

Actions – Reduce Consumption and Increase Efficiency

- MS-14.8 Partner with the public, private organizations, and non-profit agencies to develop policies that require existing residents and businesses to undertake building and appliance energy saving retrofit improvements.

Goal MS-15 – Renewable Energy

Receive 100% of electrical power from clean renewable sources (e.g., solar, wind, hydrogen) by 2022 and to the greatest degree feasible increase generation of clean, renewable energy within the City to meet the City's energy consumption needs.

Policies – Renewable Energy

- MS-15.1 Promote removal of demand-side barriers to adoption of a diverse array of renewable energy and energy efficiency technologies. Demand-side barriers include:
    - Cost
    - Difficulty getting small-scale products to market
    - Workforce availability
    - Lack of public awareness about the need for and availability of such products and technologies
    - State and Federal policies not supporting a diverse array of technologies
- MS-15.2 Lead globally in adopting technologies that transform solid waste and biosolids (i.e., the solids that remain after wastewater treatment) into useable energy.
- MS-15.3 Facilitate the installation of at least 100,000 solar roofs in San José by 2022 and at least 200,000 solar roofs by 2040.
- MS-15.4 Promote local innovation, research, development, and deployment of renewable energy and energy efficiency technologies.
- MS-15.5 Showcase and apply innovative technologies within San José, including developments that achieve maximum energy efficiency or net zero energy, and renewable energy systems that generate energy equal to or greater than that consumed on site.
- MS-15.6 Utilize municipal facilities to showcase the application of outstanding, innovative, and locally developed energy efficiency and renewable energy technologies and practices, to demonstrate the effectiveness of these technologies and to highlight the City's energy leadership.

Actions – Renewable Energy

- MS-15.7 Host local competitions, high profile events, conferences, and symposia to promote energy efficiency and renewable energy.
- MS-15.9 Train City code enforcement and development review staff in state-of-the-art renewable energy installations, Heating, Ventilation, and Air Conditioning (HVAC) and insulation industry standards, best practices, and resources to ensure buildings are constructed in compliance with those industry standards and best practices.

Goal MS-3 – Water Conservation and Quality

Maximize the use of green building practices in new and existing development to minimize use of potable water and to reduce water pollution.

Policies – Water Conservation and Quality

- MS-3.2 Promote use of green building technology or techniques that can help reduce the depletion of the City's potable water supply as building codes permit. For example, promote the use of captured rainwater, graywater, or recycled water as the preferred source for non-potable water needs such as irrigation and building cooling, when appropriate.

Actions – Water Conservation and Quality

- MS-3.6 Develop and maintain policies, ordinances, and guidelines that require reduced use of potable water and that reduce water pollution.
- MS-3.7 Update the Green Building Ordinance to require installation of water efficient fixtures and appliances that are WaterSense certified, Energy Star rated, or equivalent during construction or renovation of bathrooms, kitchens, laundry areas, and/or other areas with water fixtures/appliances that are proposed to be replaced.

Goal MS-18 – Water Conservation

Continuously improve water conservation efforts in order to achieve best in class performance. Double the City's annual water conservation savings by 2040 and achieve half of the Water District's goal for Santa Clara County on an annual basis.

Policies – Water Conservation

- MS-18.1 Demonstrate environmental leadership by adopting citywide policies that encourage or require new and existing development to incorporate measures to reduce potable water demand and/or increase water efficiency in order to reduce the City's need for imported water.
- MS-18.2 Demonstrate environmental leadership by encouraging the creation and use of new technologies that reduce potable water demand and/or increase the efficiency of water use.
- MS-18.3 Retrofit existing development to improve water conservation.
- MS-18.4 Reduce residential per capita water consumption by 25% by 2040.
- MS-18.5 Achieve by 2040, 50 Million gallons per day of water conservation savings in San José, by reducing water use and increasing water efficiency.

Actions – Water Conservation

- MS-18.7 Encourage state legislation to improve water use efficiency through statewide mandates and appropriate regulations to encourage water efficient development (for example, plumbing code, graywater code, and the green building policy)
- MS-18.8 Partner with other agencies to incentivize water conservation by developing costsharing agreements on rebates and other incentive programs.

- MS-18.9 Partner with other agencies on education and outreach to engage the community in an ethic of efficient water use and the use of water-efficient practices and technologies.
- MS-18.10 Adopt guidelines or ordinances that encourage or require Bay-friendly, water efficient design, landscape and irrigation within San José.
- MS-18.12 Encourage graywater use when appropriate and in areas that do not impact groundwater quality as determined through coordination with local agencies.
- MS-18.13 Participate in regional efforts to develop codes and standards for stormwater capture and graywater reuse, when feasible or cost-effective, and in areas that do not impact groundwater quality as determined through coordination with local agencies.
- MS-18.14 Adopt city codes and standards and work with local, regional, state and other public and private agencies to increase water use efficiency within San José and neighboring jurisdictions.
- MS-18.15 Review and publicly report on the achievement of water conservation goals and policies on a regular basis to monitor and achieve success.
- MS-18.16 Encourage the development of new water efficiency, conservation and reuse technologies by providing opportunities for pilot testing and evaluation and incentives for early adoption of such technologies within the community.

Goal MS-19 – Water Recycling

Recycle or beneficially reuse 100% of the City's wastewater supply, including the indirect use of recycled water as part of the potable water supply.

Policies – Water Recycling

- MS-19.1 Require new development to contribute to the cost-effective expansion of the recycled water system in proportion to the extent that it receives benefit from the development of a sustainable local water supply.
- MS-19.2 Support local, regional and statewide efforts to educate the community about the benefits, reliability and quality of recycled water and the critical role it plays in our water supply.
- MS-19.3 Expand the use of recycled water to benefit the community and the environment
- MS-19.4 Require the use of recycled water where feasible and cost-effective to serve existing and new development so as to maximize the use of recycled water.

Actions – Water Recycling

- MS-19.8 Initiate and support statewide laws and policies that increase the percentage of recycled water included in the State's water portfolio, encourage safe water recycling, promote community tolerance for the use of recycled water, and provide funding for regional and local recycled water projects.

- MS-19.11 Provide technical assistance to industries and community businesses to facilitate the use of recycled water. Support recycled water research to increase understanding of all safe and viable uses for recycled water in our community.
- MS-19.12 Adopt city codes and standards and work with local, regional, state and other public and private agencies to dramatically increase use of recycled water within San José and neighboring jurisdictions.
- MS-19.13 Review and publicly report on the achievement of water recycling goals and policies on a regular basis to monitor and achieve success.

A. Appendices

A.1 Natural Gas and Electric Appendices

Table 1A – Net electric load Assessment

	Table 1A: Net Electric Load Assessment		
Land Use	Existing Demand (KW)	Developed Demand (KW)	Increase / (Decrease)
Residential			
Single-Family	-	188	188
Multi-Family	-	2,305	2,305
Townhouses	-	351	351
	-	2,844	2,844
Non-Residential			
Commercial	929	140	(788)
Industrial	1,420	-	(1,420)
Medical Office	37	-	(37)
Misc	332	-	(332)
Office	174	211	36
Parking Lot	-	-	-
Vacant	-	-	-
	2,892	351	(2,541)
Total Electric	2,892	3,195	302
			10.4%

Table 1B – Net Natural Gas Peak Load Assessment

Table 1B: Net Natural Gas Peak Load Assessment			
Land Use	Existing Demand (cf/hr)	Developed Demand (cf/hr)	Increase / (Decrease)
Residential			
Single-Family	-	311	311
Multi-Family	-	3,915	3,915
Townhouses	-	596	596
	-	4,823	4,823
Non-Residential			
Commercial	1,647	332	(1,315)
Industrial	2,014	-	(2,014)
Medical Office	65	-	(65)
Misc	589	-	(589)
Office	362	597	235
Parking Lot	-	-	-
Vacant	-	-	-
	4,678	929	(3,749)
Total Gas Consumption	4,678	5,752	1,074
			23.0%

Table 1C – Comparison of Existing vs. Developed Space

Table 1C: Comparison of Existing vs. Developed Space		
	Existing Buildout (sf)	Developed Buildout (sf)
Non-Res to Res (Table 2B)	150,508	708,300
Non-Res to Non-Res (Table 3B)	179,300	65,500
	329,808	773,800
Net Increase	443,992	
	174%	

Table 2-A: Land Use Transition to Residential and Development Demand

Table 2-A: Land Use Transistion to Residential and Development Demands

Use	Site	Sub-district	Current Use	Developed Units	Sq Ft per Unit	Development Peak Electric Demand (KW)	Development Peak Gas Demand (cf/hr)
Multi-Family							
	3	Downtown Shoreline	Industrial	272	900	918	1,559.2
	4	Downtown Shoreline	Industrial	49	900	165	280.9
	8	Downtown Neighborhood	Vacant	9	900	30	51.6
	28	Downtown Neighborhood	Vacant	12	900	41	68.8
	32	Downtown Neighborhood	Vacant	4	900	14	22.9
	9	Downtown Core	Commercial	64	900	216	366.9
	10	Downtown Core	Commercial	35	900	118	200.6
	12	Downtown Core	Commercial	9	900	30	51.6
	13	Downtown Core	Parking Lot	40	900	135	229.3
	14	Downtown Core	Vacant	14	900	47	80.3
	17	Downtown Core	Vacant	4	900	14	22.9
	19	Downtown Core	Parking Lot	4	900	14	22.9
	26	Downtown Core	Vacant	9	900	30	51.6
	27	Downtown Core	Commercial	83	900	280	475.8
	misc	Downtown Core	Misc	75	900	253	429.9
				683		2,305	3,915.2
Townhomes							
	3	Downtown Shoreline	Industrial	24	1,300	117	198.7
	6	Downtown Neighborhood	Vacant	7	1,300	34	58.0
	7	Downtown Neighborhood	Commercial	7	1,300	34	58.0
	29	Downtown Neighborhood	Office	6	1,300	29	49.7
	30	Downtown Neighborhood	Office	5	1,300	24	41.4
	15	Downtown Core	Commercial	5	1,300	24	41.4
	20	Downtown Core	Medical Office	5	1,300	24	41.4
	21	Downtown Core	Office	9	1,300	44	74.5
	22	Downtown Core	Medical Office	4	1,300	20	33.1
				72		351	596.2
Single Family							
	31	Grandview	Vacant	25	2,200	188	311.4
		Totals		**780**		**2,844**	**4,823**

Note: Electric estimates were base on a peak load use of 3.75 watts per square foot of multi-family use; 3.75 watts per square foot of Townhomes, and 4.5 watts per square foot of single family use. Gas demand was based on an average use of 491 therms per year for a single family residence, factored by square footage for multi-family and townhomes, and divided by 40 percent to estimate peak demand.

Table 2-B: Estimate of Existing Land Use

		Table 2-B: Estimate of Existing Land Use				
				Unit	Developed	Existing Building
Site	Sub-district	Current Use	Units	SQ FT	SF Area	SF Area
3	Downtown Shoreline	Industrial	272	900	244,800	16,970
4	Downtown Shoreline	Industrial	49	900	44,100	477
8	Downtown Neighborhood	Vacant	9	900	8,100	-
28	Downtown Neighborhood	Vacant	12	900	10,800	-
32	Downtown Neighborhood	Industrial	4	900	3,600	897
9	Downtown Core	Commercial	64	900	57,600	11,723
10	Downtown Core	Commercial	35	900	31,500	5,753
12	Downtown Core	Commercial	9	900	8,100	3,343
13	Downtown Core	Parking Lot	40	900	36,000	-
14	Downtown Core	Vacant	14	900	12,600	-
17	Downtown Core	Vacant	4	900	3,600	-
19	Downtown Core	Parking Lot	4	900	3,600	-
26	Downtown Core	Industrial	9	900	8,100	1,009
27	Downtown Core	Commercial	83	900	74,700	26,550
misc	Downtown Core	Misc	75	900	67,500	41,538
			683		614,700	108,260
3	Downtown Shoreline	Industrial	24	1,300	31,200	16,970
6	Downtown Neighborhood	Vacant	7	1,300	9,100	-
7	Downtown Neighborhood	Commercial	7	1,300	9,100	3,900
29	Downtown Neighborhood	Office	6	1,300	7,800	3,871
30	Downtown Neighborhood	Office	5	1,300	6,500	3,500
15	Downtown Core	Commercial	5	1,300	6,500	6,315
20	Downtown Core	Medical Office	5	1,300	6,500	1,507
21	Downtown Core	Office	9	1,300	11,700	3,082
22	Downtown Core	Medical Office	4	1,300	5,200	3,103
			72		93,600	42,248
	Totals		755		708,300	150,508

Table 2-C: Forecast of Existing Loads from Land Transitioned to Residential Use

Table 2-C: Forecast of Existing Loads From Land Transitioned to Residential Use

Land Use	Square Feet of Existing Use	Electric Usage (Watts/SF)	Electric Demand (KW)	Gas Usage (therms/sf/yr)	Gas Demand (cf/hour)
Commercial	57,584	8.0	461	49.7	816.8
Industrial	36,323	10.0	363	49.7	515.2
Medical Office	4,610	8.0	37	49.7	65.4
Miscellaneous	41,538	8.0	332	49.7	589.2
Office	10,453	8.0	84	49.7	148.3
Parking Lot	-	3.0	-	0	-
Vacant	-	0.0	-	0	-
	150,508		1,277		2,135

Table 3-A: Non-Residential Development Use

Table 3-A: Non-Residential Develoment Use

Site	Sub-district	Current Use	Future Use	Square Feet
11	Downtown Core	Industrial	Commercial	9,900
18	Downtown Core	Commercial	Commercial	6,000
24	Downtown Core	Industrial	Commercial	7,500
			Commercial Subtotal	23,400
9	Downtown Core	Commercial	Office	2,600
18	Downtown Core	Commercial	Office	6,000
24	Downtown Core	Industrial	Office	7,500
5	Downtown Shoreline	Industrial	Office (live/work)	26,000
			Office Subtotal	42,100

Table 3-B: Non-Residential Land use and Load

Table 3-B: Non-Residential Land Use and Load					
				Existing	Existing
		Electric	Gas	Electric	Gas Peak
Land Use	Existing Use (SF)	W/SF	Ave CF/H	Load (KW)	Load (cf/h)
Commercial	58,500	8	49.7	468	830
Office	15,100	6	49.7	91	214
Industrial	105,700	10	49.7	1,057	1,499
	179,300			1,616	2,543
				Developed	Developed
		Electric	Gas	Electric	Gas Peak
Land Use	Developed (SF)	W/SF	Ave CF/H	Load (KW)	Load (cf/h)
Commercial	23,400	5	49.7	140.4	331.90
Office	42,100	6	49.7	210.5	597.14
Industrial	-		49.7	-	-
	65,500			351	929

A.2 Sanitary Sewer Appendices

Figure ES-3 Capacity Deficiency Corridors Identified for Projects

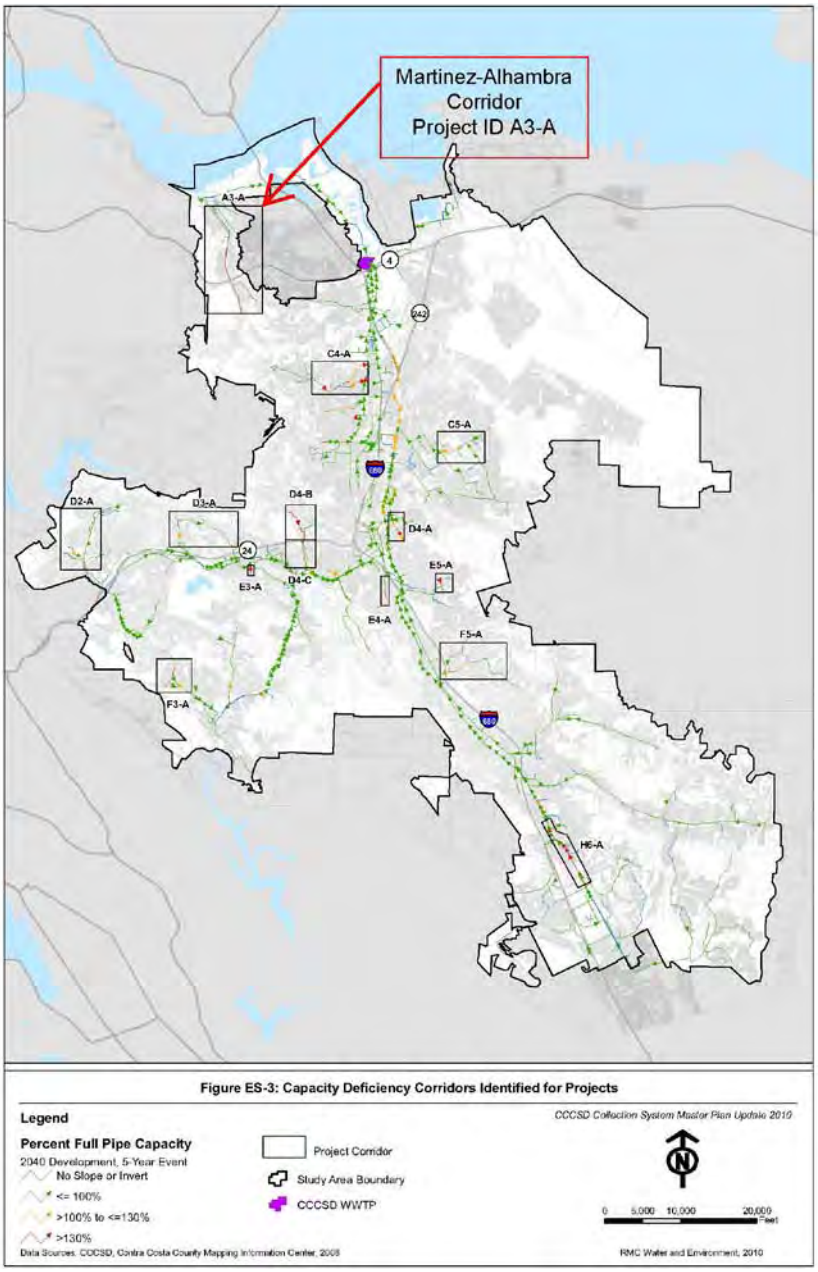

Figure 12: Capacity Deficiencies and Improvements for Corridor A3-A, CCCSD Collection System Master Plan Update Final Report-Appendices Vol. 1, dated May 2010

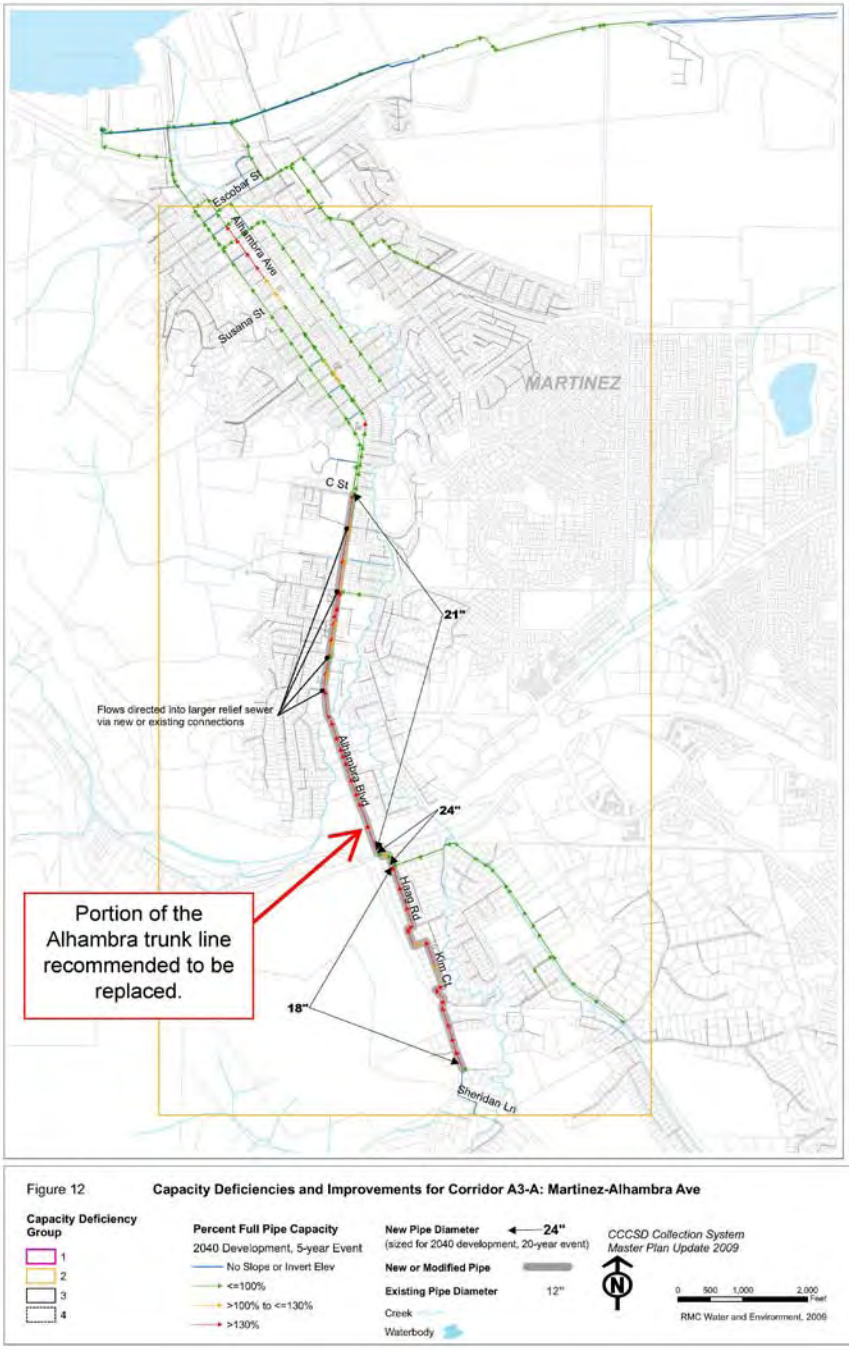
Escobar St
Alhambra Ave
Susana St
MARTINEZ
C St
21"
Flows directed into larger relief sewer via new or existing connections
Alhambra Blvd
24"
Hasp Rd
Kiln Ct
18"
Sheridan Ln
Portion of the Alhambra trunk line recommended to be replaced.
Figure 12
Capacity Deficiencies and Improvements for Corridor A3-A: Martinez-Alhambra Ave
Capacity Deficiency Group
1
2
3
4
Percent Full Pipe Capacity
2040 Development, 5-year Event
No Slope or Invert Elev
<=100%
>100% to <=130%
>130%
New Pipe Diameter
24"
(sized for 2040 development, 20-year event)
New or Modified Pipe
Existing Pipe Diameter
12"
Creek
Waterbody
CCCSD Collection System
Master Plan Update 2009
N
0 500 1,000 2,000 Feet
RMC Water and Environment, 2009

Figure 1: Foster Street between Richardson Street and Berrellesa Street

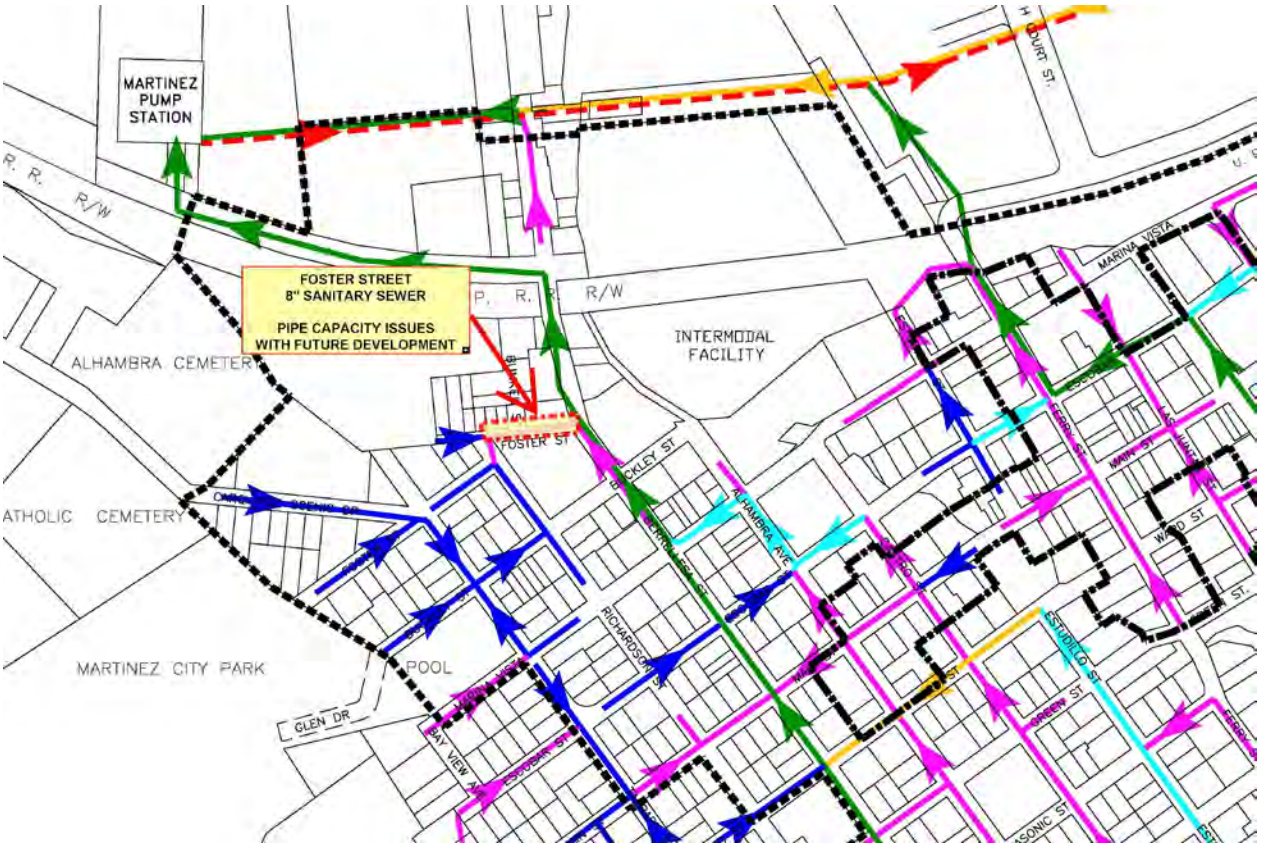

Figure 12 – Capacity Deficiencies and Improvements for Corridor A3-A

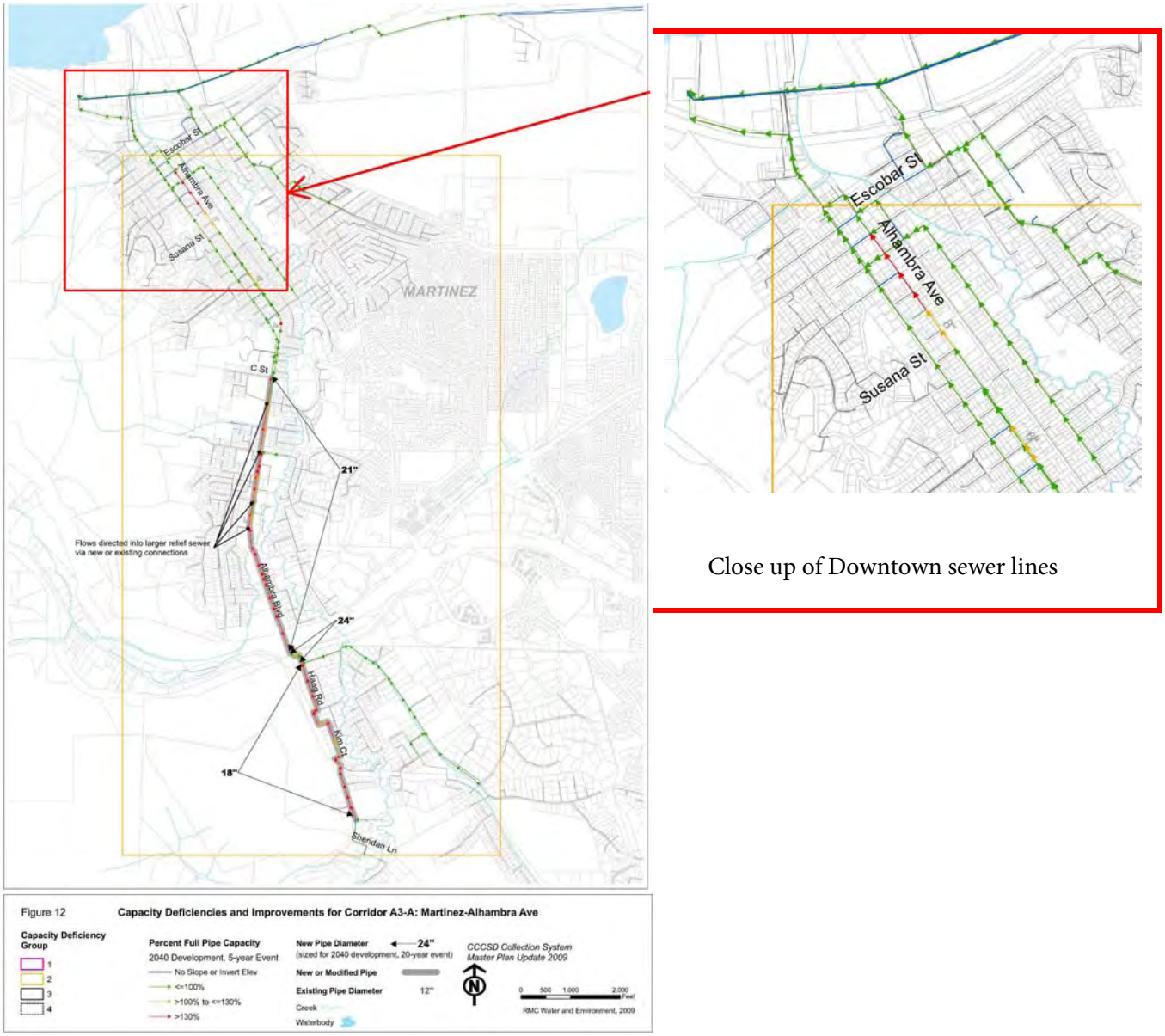

Figure ES-5: Recommended Sewer Improvement Projects by Priority Group, CCCSD Collection System Master Plan Update Final Report, dated May 2010

Table ES-5 presents the required pipe length and diameters of the recommended projects, and the estimated total project cost.

Table ES - 5: Recommended Sewer Improvement Projects by Priority Group

Project ID	Project Name	New Pipe Length[1] (feet)	New Pipe Diameter[1] (inches)	Estimated Total Project Cost[2] ($'000)
Priority Group 1 Projects				
C4-A	Pleasant Hill - Pleasant Hill Rd/Grayson Creek	9,552	18 - 24	4,155
D4-B	Lafayette - Pleasant Hill Road (Phase I – north of Hwy 24)	4,829	15 - 18	1,676
E4-A	Walnut Creek – Lancaster Road	4,067	15 - 18	1,424
H6-A	San Ramon – San Ramon Schedule C	6,628	36	3,300
	Priority Group 1 Subtotal	**25,076**		**10,555**
Priority Group 2 Projects				
A3-A	Martinez - Alhambra Ave	9,976	18 - 24	3,964
D4-A	Walnut Creek - Walnut Blvd.	2,005	18	1,901
E5-A	Walnut Creek – Palmer Road	1,026	15	350
F3-A	Orinda – Moraga Way	6,702	12 - 15	2,592
	Priority Group 2 Subtotal	**19,709**		**8,807**
Priority Group 3 Projects				
D2-A	Orinda - Miner Road/Camino Pablo	826	15	282
D3-A	Lafayette - Happy Valley Road	3,172	15 - 18	1,118
F5-A	Alamo – Stone Valley Road	8,430	15 - 27	3,483
	Priority Group 3 Subtotal	**12,428**		**4,883**
Priority Group 4 Projects				
C5-A	Walnut Creek - Contra Costa Canal Trail	4,539	24	1,820
D4-C	Lafayette – Pleasant Hill Road (Phase II – south of Hwy 24)	3,159	21	1,175
E3-A	Lafayette – Moraga Road	982	15	335
	Priority Group 4 Subtotal	**8,680**		**3,330**
			TOTAL	**27,575**

Notes:
(1) District will refine project alignments and pipe sizes during project implementation.
(2) Engineering New Record Construction Cost Index (ENR-CCI) 9781. San Francisco Bay Area, September 2009.

Water Efficiency LEED Credits, LEED Reference Guide for Green Building Design and Construction – 2009 Edition

Credit	Title
WE Prerequisite 1	Water Use Reduction
WE Credit 2	Innovative Wastewater Technologies
WE Credit 3	Water Use Reduction

*WE Credit 1 - Water Efficient Landscaping is not included as part of the design practices for reducing sanitary sewer demands

SANITARY SEWER INFRASTRUCTURE IMPROVEMENTS COST ESTIMATES

Table 1 - Pipe sizes and flows for a pipe designed at two-thirds full capacity for Main Street between Berrellesa Street and Alhambra Avenue

Table 1

Pipe Size	Min. Slope	Flow, Q (cfs)
8”	0.0077	0.85
10”	0.0057	1.29
12”	0.0022	2.47

Table 2 - Cost Estimate for Main Street (between Berrellesa Street and Alhambra Avenue)

DESCRIPTION	QTY	UNIT	UNIT COST	AMOUNT
12" VCP	258[(2)]	LF	$120	$30,9600
			Subtotal	$30,960
			20% Contingency	$6,192
			15% Design & Staking	$4,644
			5% Project Management	$1,548
			Subtotal	$12,384
			Total	**$43,344**

Table 3 - Pipe sizes and flows for a pipe designed at two-thirds full capacity for Foster Street between Richardson Street and Berrellesa Street

Table 3

Pipe Size	Min. Slope	Flow, Q (cfs)
6"	0.0050	0.32
8"	0.0050*	0.85

*Replace sewer at the same slope as original pipe size

Table 4 - Required size for the 8" line on Foster Street

Table 4

Pipe Size	Min. Slope	Flow, Q (cfs)
8"	0.0077	0.85
10"	0.0057	1.29

Table 5 - Cost Estimate for Foster Street (between Richardson and Berrellesa Street)

DESCRIPTION	QTY	UNIT	UNIT COST	AMOUNT
8" VCP	156(2)	LF	$100	$15,600
10" VCP	234(2)	LF	$115	$26,910
			Subtotal	$42,510
			20% Contingency	$8,502
			15% Design & Staking	$6,377
			5% Project Management	$2,126
			Subtotal	$17,005
			Total	**$59,515**

Table 6 -Pipe sizes and flows for a pipe designed at two-thirds full capacity for Alhambra Avenue between Escobar Street and Susana Street

Table 6

Pipe Size	Min. Slope	Flow, Q (cfs)
8”	0.0077	0.85
10”	0.0057	1.29
12”	0.0022	2.47
15”	0.0015	4.47

Table 7 - Cost Estimate for Alhambra Avenue between Escobar Street and Susana Street

DESCRIPTION	QTY	UNIT	UNIT COST	AMOUNT
10” VCP *(Escobar to Main Street)*	258[(2)]	LF	$115	$29,670
15” VCP *(Main to Susana Street)**	1,510[(2)]	LF	$130	$196,300
			Subtotal	$225,970
			20% Contingency	$45,194
			15% Design & Staking	$33,895
			5% Project Management	$11,298
			Subtotal	$90,388
			Total	**$316,358**

*Required pipe size for sewer lines between Mellus and Susana Street were assumed due to lack of future sewer flow information at this time. Further analysis of these lines is to be investigated prior to implementation of the Downtown Specific Plan.