CITY OF SIMI VALLEY

Sanitation Asset Reliability Assessment and Financial Plan

Asset Management Plan Report

Final

APRIL 2011

carollo

Engineers...Working Wonders With Water®

CITY OF
SIMI VALLEY

City of Simi Valley

SANITATION ASSET RELIABILITY ASSESSMENT AND FINANCIAL PLAN
ASSET MANAGEMENT PLAN REPORT

FINAL

April 2011

Registered Professional Engineer (Civil)
CERTIFICATE NO. 32829
DANIEL PHILIP BAKER
Date Signed.....
ARIZONA, U.S.A

REGISTERED PROFESSIONAL ENGINEER
KAUMUDI ATAPATTU
No. C74257
Exp. 06/30/11
CIVIL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
REBECCA CAROL OVERACRE
No. C74975
Exp. 12/31/11
CIVIL
STATE OF CALIFORNIA

Signed: 4/6/2011 Signed: 4/6/2011 Signed: 4/6/2011

carollo
Engineers...Working Wonders With Water®

5075 SHOREHAM PLACE • SUITE 120 • SAN DIEGO, CALIFORNIA 92122 • (858) 505-1020 • FAX (858) 505-1015

City of Simi Valley

SANITATION ASSET RELIABILITY ASSESSMENT AND FINANCIAL PLAN
ASSET MANAGEMENT PLAN REPORT

TABLE OF CONTENTS

Page No.

CHAPTER 1 - EXECUTIVE SUMMARY

1.1 ASSET MANAGEMENT VISION 1-1
1.2 ASSET INVENTORY AND ASSESSMENT 1-2
1.3 ASSET REPLACEMENT COST 1-6
1.4 R&R CAPITAL IMPROVEMENT PROGRAM 1-6
1.5 RATE IMPACT 1-7

CHAPTER 2 - ASSET MANAGEMENT VISION

2.1 ASSET MANAGEMENT OVERVIEW 2-1
2.1.1 Purpose for Asset Management Plan 2-4
2.1.2 Asset Management Methodology 2-4
2.1.3 Expected Asset Management Outcomes 2-5
2.2 CITY OF SIMI VALLEY ASSET MANAGEMENT VISION 2-5
2.2.1 Level of Service Goals 2-5
2.2.2 Asset Vulnerability and Criticality Factors 2-6
2.2.3 Proposed Performance Measures 2-7

CHAPTER 3 - ABOVEGROUND ASSET RELIABILITY ASSESSMENT

3.1 ASSET INVENTORY 3-1
3.2 RELIABILITY ASSESSMENT FINDINGS 3-1
3.2.1 Methodology 3-1
3.2.2 Headworks 3-2
3.2.3 Grit Classifiers 3-2
3.2.4 Primary Sedimentation Tanks 3-2
3.2.5 Flow Equalization Basin 3-3
3.2.6 Biological Nutrient Removal 3-3
3.2.7 Secondary Clarification 3-4
3.2.8 Filtration 3-4
3.2.9 Chlorination/Dechlorination 3-4
3.2.10 Dissolved Air Flotation Thickener 3-4
3.2.11 Digestion 3-4
3.2.12 Dewatering 3-5
3.2.13 Plant Power 3-5
3.2.14 Reclaimed Water Pump Station 3-5
3.2.15 Lift Stations 3-5
3.3 VULNERABILITY 3-6
3.3.1 Original Useful Life 3-6
3.3.2 Evaluated Remaining Useful Life 3-7
3.3.3 Economic Remaining Useful Life 3-7
3.4 CRITICALITY 3-8
3.4.1 Risk Assessment 3-8

CHAPTER 4 - BELOWGROUND ASSET RELIABILITY ASSESSMENT

4.1 ASSET INVENTORY 4-1
4.2 RELIABILITY ASSESSMENT 4-1
4.3 CRITICALITY 4-5
4.3.1 Sewer Main Criticality 4-5
4.4 VULNERABILITY 4-8
4.4.1 Useful Life of Sewer Mains 4-8
4.4.1.1 Useful Life of Sewer Manholes 4-12
4.5 RISK ASSESSMENT 4-12

CHAPTER 5 - ASSET REHABILITATION AND REPLACEMENT COST EVALUATION

5.1 GENERAL 5-1
5.2 ABOVEGROUND ASSETS 5-2
5.2.1 Cost Basis and Assumptions 5-2
5.2.2 Cost Summary 5-2
5.2.3 5- and 10-Year Capital Improvement Program Recommendations 5-4
5.3 BELOWGROUND ASSETS 5-6
5.3.1 Cost Basis and Assumptions 5-6
5.3.2 Replacement Cost Summary 5-10
5.3.3 Recommendations for 5- and 10-Year Capital Improvement Programs 5-11
5.3.4 Long-Term Belowground Asset Renewal 5-15
5.4 COMBINED ABOVEGROUND AND BELOWGROUND ASSETS 5-18
5.4.1 10-Year Rehabilitation and Replacement Capital Improvement Program Summary 5-18
5.4.2 Long-Term Capital Improvement Program Forecast 5-18

CHAPTER 6 - FINANCIAL PLAN

6.1 INTRODUCTION 6-1
6.1.1 Proposition 218 Requirements 6-1
6.2 FINANCIAL FORECAST ASSUMPTIONS 6-2
6.2.1 Forecast Horizon 6-2
6.2.2 Inflation and Interest Rates 6-2
6.2.3 Sources of Funds 6-3
6.2.3.1 Rate and Charges 6-3
6.2.3.2 Reserve Funds 6-4
6.2.3.3 Fund Transfers 6-4
6.2.3.4 Grants and Loans 6-4
6.2.3.5 Connection Fees/Developer Charges 6-5
6.2.4 Uses of Funds 6-5
6.2.4.1 R&R CIP Expenditures 6-5
6.2.4.2 Reserve Fund Maintenance 6-6
6.2.5 Customer Growth and Revenue Projection 6-6
6.3 R&R CASH FLOW FORECAST 6-9
6.3.1 Scenario 1 - No Rate Adjustment 6-9
6.3.2 Scenario 2 - Annual Rate Adjustment 6-9
6.3.3 Scenario 3- One-Time Adjustment 6-9
6.4 CONCLUSIONS 6-13

APPENDIX A Condition Assessment Results, September 14-15, 2010
APPENDIX B Aboveground Risk Summary
APPENDIX C Replacement Cost Estimates for Aboveground Assets Due for Renewal in 10 Years (Additional to Specified Near-Term Projects)
APPENDIX D 10-Year Belowground Sanitation Asset Rehabilitation CIP
APPENDIX E Asset Reliability Assessment and Financial Plan Workshop Presentations

LIST OF TABLES

Table ES.1 Highest Risk Aboveground Assets 1-2
Table ES.2 Highest Risk Belowground Sewer Assets 1-3
Table ES.3 Summary of Value for Aboveground and Belowground Assets 1-6
Table ES.4 Summary of Annual Expenditures for Recommended 10-Year R&R CIP for Aboveground and Belowground Sanitation Assets 1-7
Table ES.5 Scenario Summary 1-12

Table 2.1 Criticality Matrix 2-6
Table 2.2 Proposed Performance Measures 2-7

Table 3.1 Asset Condition Assessment Ranking 3-1
Table 3.2 Original Useful Life Based on Asset Category 3-6
Table 3.3 Asset Condition Fraction 3-7
Table 3.4 Criticality Matrix 3-9
Table 3.5 Highest Risk Aboveground Assets 3-10

Table 4.1 Belowground Criticality Matrix 4-6
Table 4.2 Expected Useful Life for Sewer Pipelines 4-9
Table 4.3 Highest Risk Belowground Sewer Assets 4-13
Table 5.2 Cost Summary for Aboveground Assets 5-2

Table 5.1 Project Cost Factors 5-3
Table 5.3 Recommended Projects for 5-Year CIP for Aboveground Assets 5-4
Table 5.4 Renewals Estimated for 5- to 10-Year CIP for Aboveground Assets 5-5
Table 5.5 Cost Modifiers and Unit Cost Factors 5-7
Table 5.6 Direct Cost Factors for Belowground Assets 5-8
Table 5.7 Unit Construction Costs for CIPP and PVC Pipe 5-10
Table 5.8 Sewer Collection System Replacement Costs by Diameter 5-11
Table 5.9 Recommended Projects for 5- Year CIP for Belowground Assets 5-12
Table 5.10 Renewals Estimated for 5- to 10-Year CIP for Belowground Assets 5-14
Table 5.11 Summary of Annual Expenditures for Recommended 10-Year R&R CIP for Aboveground and Belowground Water Assets 5-18

Table 6.1 Projected Replacement Reserve Ending Fund Balance 6-4
Table 6.2 5-Year R&R CIP Summary 6-5
Table 6.4 Number of Sanitation EDUs in FYE 2011 6-6
Table 6.3 10-Year R&R CIP Summary 6-7
Table 6.5 EDU Growth Rate 6-9
Table 6.6 Scenario 1 - No Rate Adjustment 6-10
Table 6.7 Scenario 2 - Annual Rate Adjustment 6-11
Table 6.8 Scenario 3 - Single Rate Adjustment 6-12
Table 6.9 Scenario Summary 6-15

LIST OF FIGURES

Figure ES.1 Highest Risk Sewer Pipelines 1-5
Figure ES.2 Sewer Pipeline R&R CIP for FY2011/12 to FY2020/21 1-8
Figure ES.3 Estimated Replacement Costs by Year through 2021 1-10

Figure 2.1 Examples of Water and Sewer Asset Failure from Other Utilities 2-2
Figure 2.2 Historical Belowground Infrastructure Development 2-3

Figure 4.1 Feet of Sewer Pipe by Material Type 4-2
Figure 4.2 Feet of Sewer Pipe by Installation Year 4-3
Figure 4.3 Feet of Sewer Pipe by Diameter 4-4
Figure 4.4 Criticality of Sewer Pipelines 4-7
Figure 4.5 Projected Replacement Year of Sewer Pipelines 4-10
Figure 4.6 Vulnerability of Sewer Pipelines 4-11
Figure 4.7 Risk of Sewer Pipelines 4-15

Figure 5.1 Projected Sewer Pipe Rehabilitation Length 5-16
Figure 5.2 Estimated Sewer Pipe Rehabilitation Cost 5-17
Figure 5.3 Aboveground and Belowground Sewer Assets Estimated Annual R&R Costs 5-19

Figure 6.1 10-Year R&R CIP Expenditures 6-8

EXECUTIVE SUMMARY

1.1 ASSET MANAGEMENT VISION

In the fall of 2010, the City of Simi Valley (City) initiated its Sanitation Asset Reliability and Financial Plan in order to validate the City's investments in its wastewater facilities. Through a Strategy Workshop held at the start of the project, the City refined its risk-based approach, criticality ranking, performance metrics, and determined expected outcomes of the program, or Asset Management Plan (AMP). The objectives of the AMP are to:

- Evaluate and update the City's existing asset inventory.
- Identify capital assets in need of replacement funding and determine replacement timing.
- Incorporate the results of previous planning and asset evaluation efforts into a single encompassing plan for all aboveground and belowground sanitation assets.
- Prioritize the rehabilitation and replacement (R&R) of assets through a risk-based framework - assessment of the asset's vulnerability and criticality.
- Develop policy options for rate adjustments to support the required R&R program.

During the Strategy Workshop, the City decided to review and adopt performance metrics developed by the American Water Works Association and the Water Environment Federation. As the AMP continues, the City will review these performance metrics and select those that are relevant for the City in the categories of employee efficiency and health, customer service, financial management, technical/engineering, operations and maintenance, and regulatory compliance.

The AMP methodology and work products developed throughout the visioning process can be outlined in the following three steps:

1. **Asset Reliability Assessment** - Completion of an asset inventory and asset condition assessment (including criticality, vulnerability, and prioritization of repair/replacement based on risk).
2. **Asset Valuation and Replacement Schedule** - Determination of asset values and renewal costs; development of Asset Replacement CIP for a 10-year planning period.
3. **Financial Analysis -** Calculation of the replacement schedule's impact to user rates and reserve funding requirements.

Following conclusion of the AMP, the City will consider the rate changes necessary to fund the anticipated R&R projects. This document will also serve as the Engineer's Report in support of the Proposition 218 process and requirements for rate adjustments.

1.2 ASSET INVENTORY AND ASSESSMENT

A visual condition assessment was conducted for the City's wastewater treatment plant and sewer lift stations. Belowground assets were assessed as part of a desktop exercise using GIS data and available maintenance data. The visual condition assessment included a field evaluation of key assets by a multi-discipline engineering team licensed and experienced in various fields of engineering. The team assessed the City's wastewater treatment plant and sewer lift stations. The highest risk aboveground assets are shown in Table ES.1. As can be seen in the table, the highest risk was found to be in the Ferric Containment Area, largely due to the health and safety criticality factor. Also at high risk were the electrical gear previously identified in the ArcFlash and Short Circuit Study. Remaining high risk assets vary between those with very high criticality and those with moderate criticality scores but high vulnerability due to condition or short service life. The full listing of asset criticality, vulnerability, and risk scores can be found in Appendix B.

Table ES.1 Highest Risk Aboveground Assets
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Facility	Asset	Vulnerability	Criticality	Risk
Digestion	Ferric Chloride Containment Area	0.40	5.05	2.02
Plant Power	MCC-B1, B2, C1, C2, D, E, F, G	0.33	5.95	1.98
Plant Power	Automatic Transfer Switch E	0.33	4.6	1.53
Plant Power	Switchboard GEN	0.33	3.85	1.28
Filtration	Applied Pump VFDs #1, 2, and 3	0.67	1.9	1.27
Digestion	Waste Gas Burner	0.11	5.8	0.64
Headworks	Headworks Effluent Box	0.20	2.65	0.53
Lift Stations	Arroyo Lift Station Submersible Pumps	0.16	3.25	0.52
Lift Stations	Big Sky Lift Station Submersible Pumps	0.16	3.25	0.52
Lift Stations	Wood Ranch Lift Station Submersible Pumps	0.14	3.25	0.46
Digestion	Waste Gas Burner	0.08	5.8	0.48
Plant Power	Distribution Panel DEP	0.11	3.55	0.39
Plant Power	MCC-DCC	0.06	5.95	0.33
Chlor/Dechlor	Sodium Hypochlorite Feed Pumps #1, 2, and 3	0.08	3.85	0.32
Grit Classifiers	Grit Pump #3	0.11	2.8	0.31
Plant Power	Caterpillar Generator	0.07	4	0.30
Filtration	Applied Pumps #1, 2, and 4	0.11	2.65	0.29

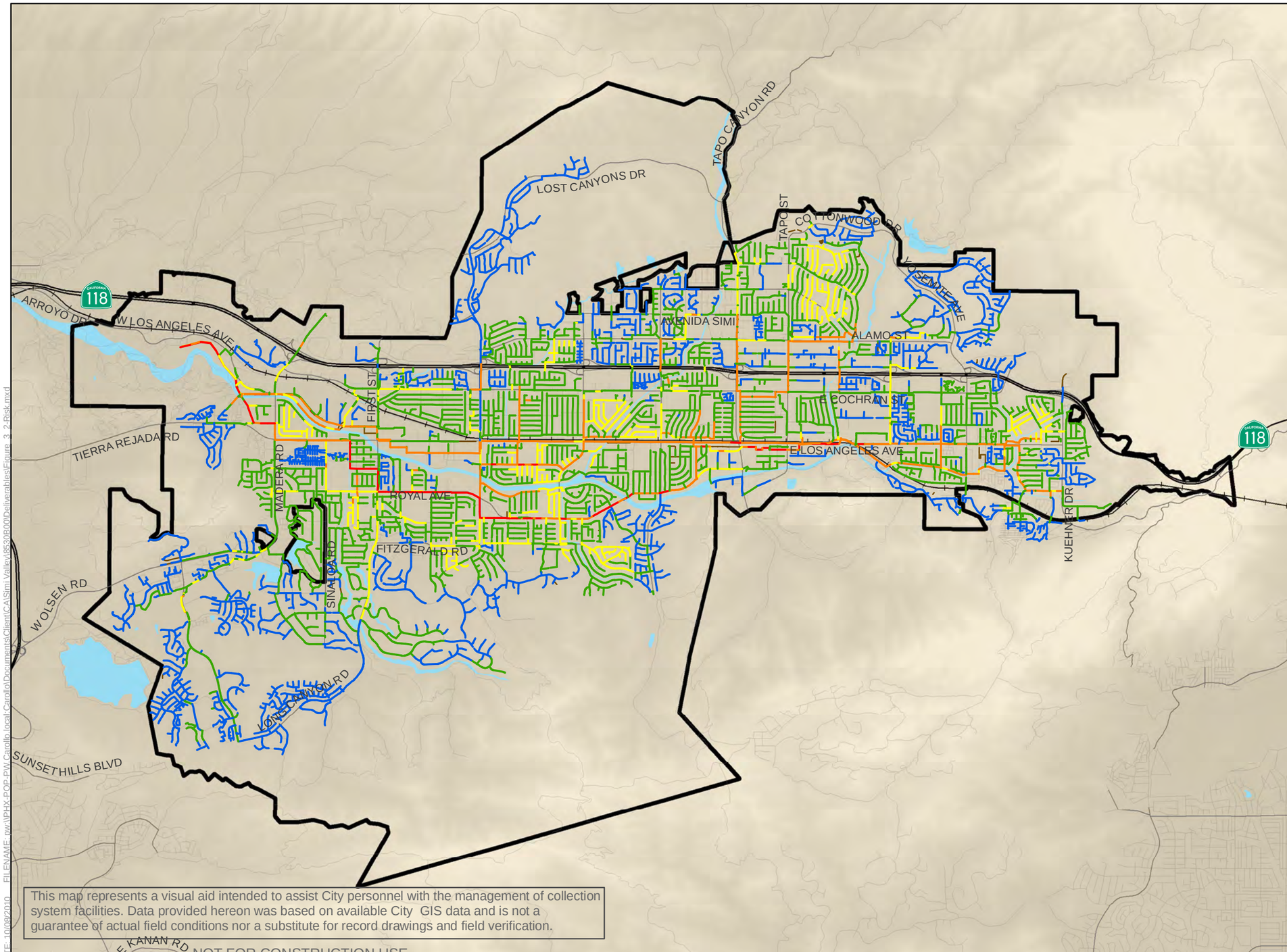
The highest risk belowground sewer assets are shown in Table ES.2 and illustrated in the map contained in Figure ES.1.

Table ES.2 Highest Risk Belowground Sewer Assets
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Feature ID	Street Name	From Manhole	To Manhole	Length (ft.)	Size (in.)	Material	Install. Year	Risk
L91047	ROYAL AVE	L9-143	L9-142	396	24	ACP	1961	9.1
L91046	ROYAL AVE	L9-172	L9-147	335	24	ACP	1961	9.1
L91045	ROYAL AVE	L9-147	L9-146	320	24	ACP	1961	9.1
L91019	ROYAL AVE	L9-171	L9-145	300	24	ACP	1961	9.1
L91012	ROYAL AVE	L9-145	L9-170	120	24	ACP	1961	9.1
L91011	ROYAL AVE	L9-144	L9-143	231	24	ACP	1961	9.1
L101054	ROYAL AVE	L10-149	L10-141	406	24	ACP	1961	9.1
L101024	ERRINGER	L10-149	L10-141	324	20	ACP	1961	9.1
L101023	ERRINGER	L10-141	L10-131	354	20	ACP	1961	9.1
L101022	ROYAL AVE	L10-131	L10-120	400	24	ACP	1961	9.1
L101021	ROYAL AVE	L10-120	L10-118	301	24	ACP	1961	9.1
L101020	ROYAL AVE	L10-118	L10-117	297	24	ACP	1961	9.1
L101019	ROYAL AVE	L10-117	L10-116	300	24	ACP	1961	9.1
L101018	ROYAL AVE	L10-116	L10-115	204	24	ACP	1961	9.1
L101002	ROYAL AVE	L10-114	L9-148	421	24	ACP	1961	9.1
O61008	UNK	BNODE	O6-124	75	33	ACP	1962	9.1
K101004	ERRINGER	K10-104	L10-149	339	20	ACP	1961	9.1
L91012	ROYAL AVE	L9-170	L9-144	52	24	ACP	1961	9.1
L91019	ROYAL AVE	L9-146	L9-171	70	24	ACP	1961	9.1
L91046	ROYAL AVE	L9-148	L9-172	10	24	ACP	1961	9.1

Table ES.2 Highest Risk Belowground Sewer Assets
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Feature ID	Street Name	From Manhole	To Manhole	Length (ft.)	Size (in.)	Material	Install. Year	Risk
N71038	E EASY ST	N7-122	N7-113	359	39	ACP	1971	8.3
M81095	5TH ST	M8-169	M8-159	376	24	ACP	1962	7.6
N71042	UNK	N7-128	N7-119	396	12	ACP	1963	6.3
M81094	5TH ST	M8-159	M8-130	366	24	ACP	1962	5.7
M81085	VENTURA	M8-172	M8-171	356	24	ACP	1962	5.7
N61030	UNK	N6-130	N6-121	406	27	ACP	1962	5.7
N61027	UNK	N6-103	N6-101	271	27	ACP	1962	5.7
O61032	UNK	O6-113	O6-108	446	33	ACP	1962	5.7
O61003	UNK	O6-124	O6-121	312	33	ACP	1962	5.7
P51004	UNK	P5-101	P5-103	543	33	ACP	1962	5.7
P61017	UNK	P6-110	P6-102	466	33	ACP	1962	5.7



LEGEND

Sewer Pipeline Segments by Risk

- 1 - Low (<0.1)
- 2 - Medium Low (0.1-0.2)
- 3 - Medium (02.-0.5)
- 4 - High (0.5 - 5.7)
- 5 - Highest Risk (>5.7)
- Not Analyzed
- Freeways
- Major Roads
- Local Roads
- Railroad
- City Limits
- Bodies of Water

N

0 0.5 1 2

Miles

Figure ES-1
Highest Risk Sewer Pipelines

Asset Reliability Assessment
and Financial Plan
City of Simi Valley

CITY OF SIMI VALLEY

carollo

DATE: 10/08/2010 FILENAME: pw:\\PHX-POP-PW.Carollo.local:Carollo\Documents\Client\CA\Simi Valley\9830B00\Deliverables\Figure_3_2-Risk.mxd

1.3 ASSET REPLACEMENT COST

The replacement values and costs presented within this report are estimates of the total project cost to purchase and install similar assets in today's dollars. Replacement values are comprised of both direct and indirect costs, which include the physical makeup of the assets as well as contingency factors, respectively. The indirect costs consisting of contingency factors, including demolition, general conditions, contractor overhead and profit, sales tax, engineering/legal/administration, construction management, and ancillary support, were applied to the direct cost to develop total project costs.

Direct costs were developed from the recent bid data from reference projects, Carollo Engineers' 3B Pipeline Model estimates, and the RS Means Construction Cost Index. These costs were adjusted and confirmed using recent construction bid data provided by the City. A summary of the total value of the City's sanitation system in 2010 dollars are shown in Table ES.3 below.

Table ES.3 Summary of Value for Aboveground and Belowground Assets
Asset Reliability Assessment and Financial Plan
City of Simi Valley

System	Value[1]
Wastewater Treatment Plant and Lift Stations	$155,500,000[2]
Sewer Collection System Pipes and Manholes	$655,296,931
Total Value of All Sanitation Assets	**$810,796,931**

Note:
1. Estimated replacement costs are presented in 2010 dollars at the 20-cities average ENR, or 8952. These costs include direct and indirect cost factors to estimate the total project cost to replace an asset in-kind. Costs are prepared in accordance with AACE International Class 4 estimates, with an expected accuracy range of -30% to +50%. Costs do not include land value.
2. Excludes costs associated with the Reclaimed Water Pump Station and system.

1.4 R&R CAPITAL IMPROVEMENT PROGRAM

Replacement costs and estimated renewal timing were used to develop a 10-year capital improvement program (CIP) focused on renewal of existing assets. Table ES.4 shows the recommended expenditures by year from FY2011/12 through FY2020/21. Figure ES.2 shows the location of the sewer pipelines recommended for rehabilitation or replacement between FY2011/12 and FY2020/21.

Table ES.4	Summary of Annual Expenditures for Recommended 10-Year R&R CIP for Aboveground and Belowground Sanitation Assets Asset Reliability Assessment and Financial Plan City of Simi Valley		
Year	**Aboveground[(1)]**	**Belowground[(1)]**	**Combined[(1)]**
11/12	$1,155,000	$3,753,000	$4,908,000
12/13	$2,433,000	$4,898,000	$7,331,000
13/14	$1,727,000	$6,366,000	$8,093,000
14/15	$1,745,000	$5,169,000	$6,914,000
15/16	$3,389,000	$5,145,000	$8,534,000
16/17	$4,073,000	$5,369,000	$9,442,000
17/18	$3,666,000	$4,175,000	$7,841,000
18/19	$1,978,000	$6,301,000	$8,279,000
19/20	$2,643,000	$6,649,000	$9,292,000
20/21	$1,241,000	$6,723,000	$7,964,000
Total	**$24,050,000**	**$54,548,000**	**$78,598,000**

Note:
1. Estimated replacement costs are presented in 2010 dollars at the 20-cities average ENR or 8952. These costs include direct and indirect cost factors to estimate the total project cost to replace an asset in-kind. Costs are prepared in accordance with AACE International Class 4 estimates, with an expected accuracy range of -30% to +50%.

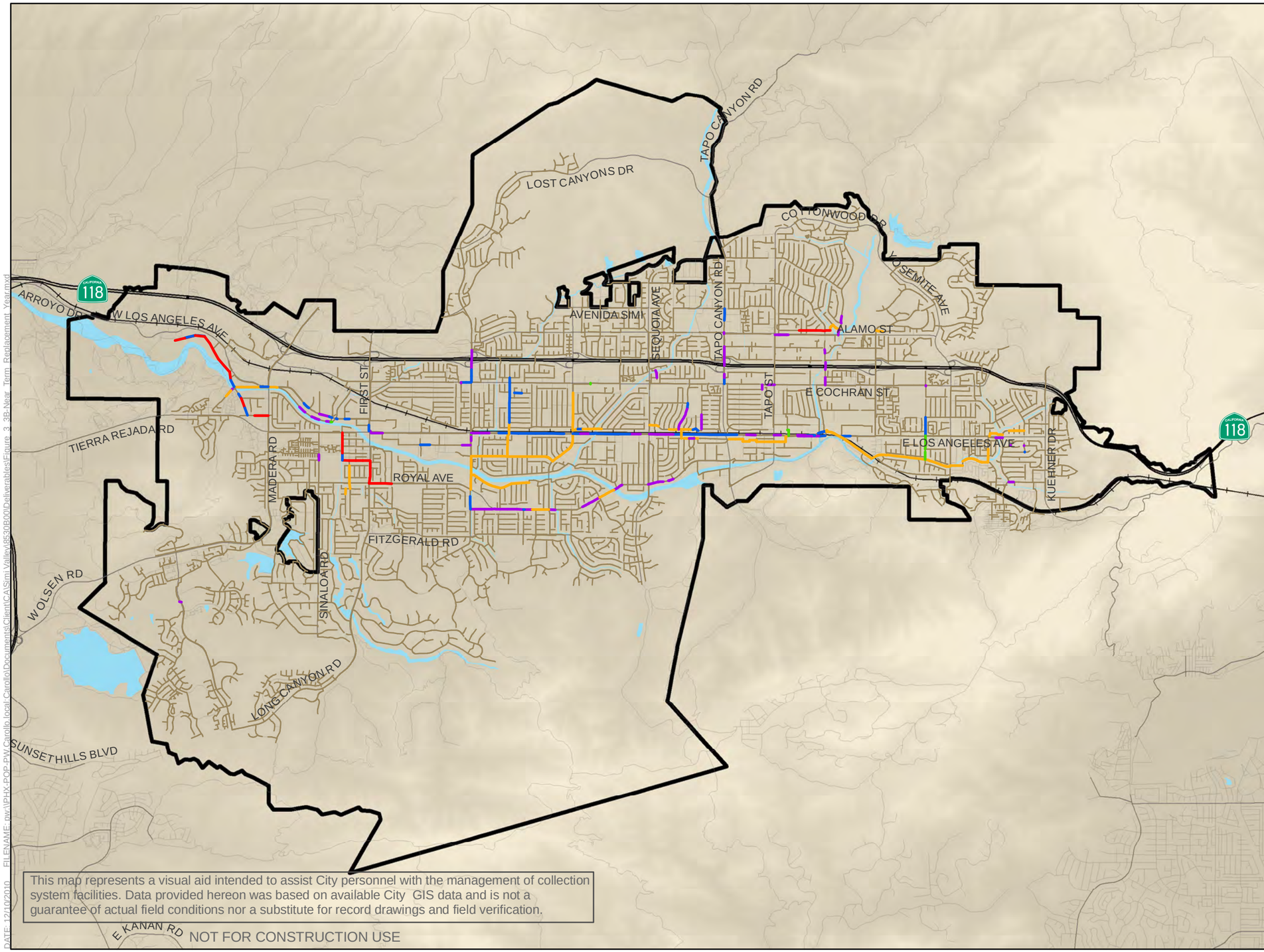
1.5 RATE IMPACT

In order to implement the necessary R&R projects, the City will need to identify financing mechanisms. The City currently utilizes a pay-as-you-go method to finance its R&R CIP using its sanitation and sewerline replacement reserves. The City anticipates continuation of this policy for the financing of its R&R needs.

The City expects that rate adjustments will be necessary to generate the revenue necessary in the near term. In order to implement a rate increase for property related services, Proposition 218 (Cal. Const., Article XIII D, Sec. 6) requires the City to:

- Inform the property owners that an increase in rates/charges is being considered.
- Clearly demonstrate the basis on which these rates/charges are calculated (the basis of costs for the R&R needs is provided in Chapter 5).
- Hold a public meeting at least 45 days after notice where the City hears all protests to the proposed rate increase.

Sewer rates are subject to “majority protest” where the rate increase cannot be implemented if a majority of the property owners impacted by the increase submit written protests objecting to the increase.



LEGEND

Sewer Pipeline Segments

by Projected Replacement Year

- Prior to 2012
- 2013/2014
- 2015/2016
- 2017/2018
- 2019/2020
- Not Analyzed or Beyond 2020
- Freeways
- Major Roads
- Local Roads
- Railroad
- City Limits
- Bodies of Water

N

0 0.5 1 2

Miles

Figure ES-2
Sewer Pipelines R&R CIP for
FY2011/12 to FY 2020/21

Asset Reliability Assessment
and Financial Plan
City of Simi Valley

CITY OF SIMI VALLEY

carollo

DATE: 12/10/2010 FILENAME: nw:\\PHX-POP-PW\Carollo\Local\Carollo\Documents\Client\CA\Simi Valley\65306900\Deliverables\Figure_3_3B-Near_Term_Replacement_Year.mxd

Rate scenario analysis were conducted to identify potential financing mechanisms and identify sewer rate impacts that may be required to finance the R&R projects needed to continue to provide adequate sewer service.

The analysis was conducted using a financial forecast for a 10-year horizon for the replacement reserve with intent of funding the necessary aboveground and belowground R&R needs over the 10-year period. Figure ES.3 presents the annual cash flow needs through the year 2021.

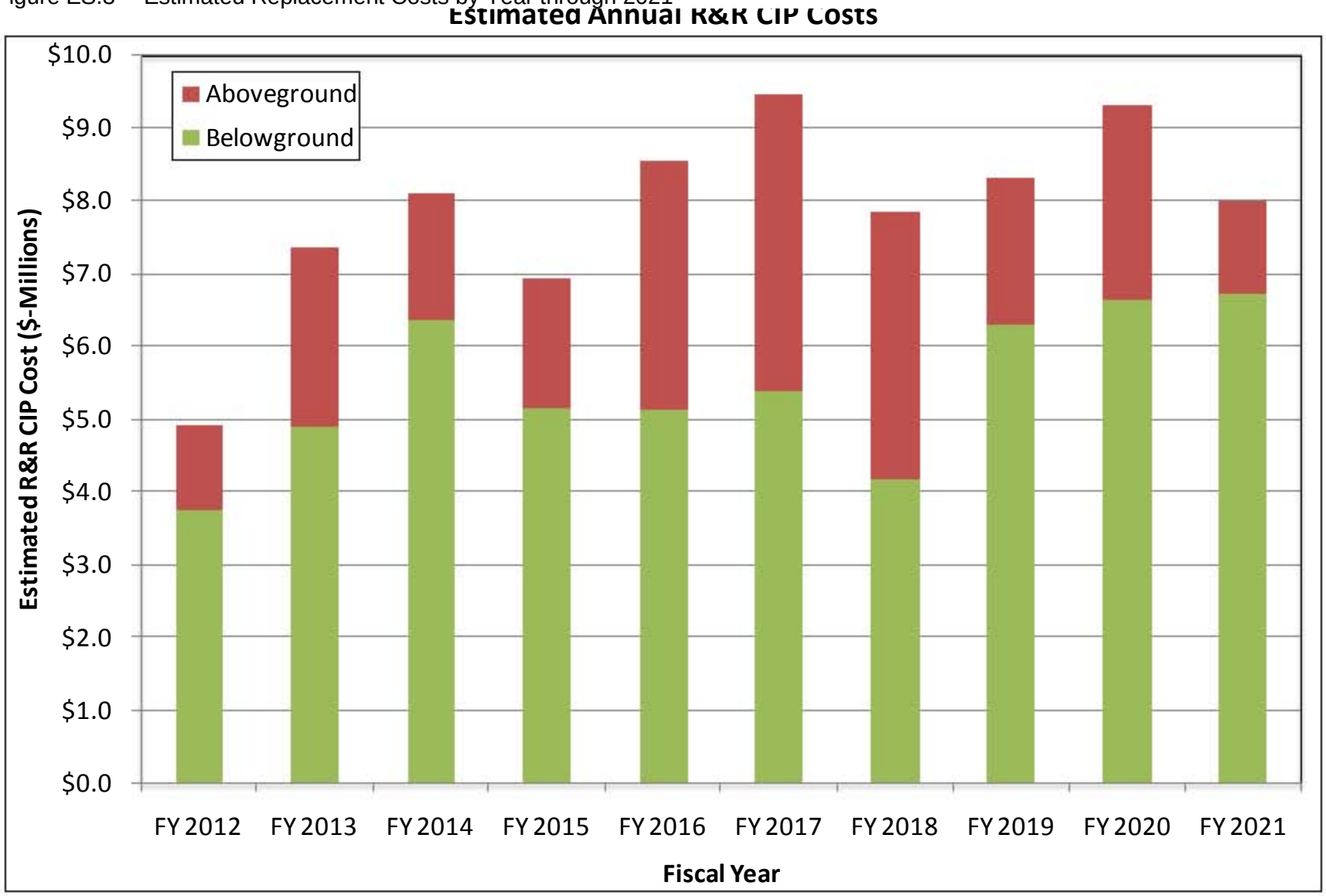
Several key assumptions were made in the development of the financial forecast. These include:

- Forecast horizon of 10 years for both the aboveground and belowground R&R CIP.
- The analysis was developed in 2011 dollars without consideration of inflationary effects, with the exception of an annual Consumer Price Index adjustment to O&M expenses of 2.5 percent.
- Zero percent interest will be generated on reserve fund balance.
- Continuation of the pay-as-you-go financing mechanism with no use of debt or other instruments for project financing.
- Continuation of annual fund transfer of $1.975 million into the sewer replacement fund.
- No use of grants, loans, developer contributions, connection fees, or other charges as a source of revenue for the replacement fund.
- No annual maximum or minimum replacement fund balance will be required.
- Replacement reserves will be used for payment of the R&R CIP only.
- All equivalent dwelling units (EDUs) currently contribute revenues equal to the monthly single family rate of $26.08.
- EDU growth will occur at a rate equivalent to the annual projected population growth for the City.
- Revenue growth will be equivalent to the compounded account growth rate and rate adjustment.

Using the above assumptions, three reserve fund scenarios were evaluated.

1. Scenario 1 – No Rate Adjustment.
2. Scenario 2 – Annual Rate Adjustment to obtain a positive fund balance by the year 2021.
3. Scenario 3 – One Time Rate Adjustment to meet CIP needs whilst minimizing fund balance.

Figure ES.3 Estimated Replacement Costs by Year through 2021



A summary of the rate adjustments and ending fund balance in Fiscal Year End (FYE) 2021 for the three rate scenarios is presented in Table ES.5 on the following page. As seen from this table, Scenario 3 results in cash financing of the necessary R&R needs while maintaining the overall lowest rate by FYE 2021.

Since the City's sanitation replacement fund is not starting with a fund balance that could support its near-term CIP needs, if the City proposes to continue to use a pay-as-you-go financing method, significant rate adjustments will be required in the near term to meet these R&R needs. Additional rate adjustments may be necessary to meet operations and other sanitation fund expenditures.

It is recommended that the City conduct a comprehensive rate study to determine the total rate adjustment needed to meet R&R and other expense needs. In the event that implementation of the rate adjustments needed for R&R projects is not viable, the City and its financial advisors should evaluate opportunities to transfer alternate unrestricted funds to the R&R reserve to meet near-term needs or utilize debt financing to smooth CIP impacts. These alternatives, coupled with gradual rate adjustments, may provide the City with the funding necessary to meet its near-term and longer-term R&R CIP needs.

Table ES.5 Scenario Summary
Asset Reliability Assessment and Financial Plan
City of Simi Valley

	FYE 2012	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021	Ending Fund Balance in FYE 2021	Single-Family Residential Rate in FYE 2021
Rate Adjustment[1]												
Scenario 1 - No Rate Adjustment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	($65,453,998)	$26.08
Scenario 2 - Annual Rate Adjustment	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	$2,603,277	$53.75
Scenario 3 - One Time Adjustment	51.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$816,065	$39.38

Notes:
1. Rate adjustment presented is that required to meet R&R CIP needs only. Additional rate adjustments may be necessary to determine increase required to meet total sanitation fund expenses.

ASSET MANAGEMENT VISION

2.1 ASSET MANAGEMENT OVERVIEW

As a utility management tool, asset management has emerged as a potential solution to help overcome the severe infrastructure deficiencies in the United States. In its Infrastructure Report Card for 2009, the American Society of Civil Engineers (ASCE) rated the nation's drinking water infrastructure and wastewater infrastructure at a "D-". This rating reflects the massive need for capital funding for water and wastewater infrastructure. In the 2002 Clean Water and Drinking Water Infrastructure Gap Analysis, the U.S. Environmental Protection Agency (EPA) estimates a capital funding gap of $224 billion through 2019.

Without effective utility management and a proactive approach to managing assets, the nation's water and wastewater infrastructure will continue to deteriorate, leading to negative consequences. The following photos in Figure 2.1 show the evidence of this deterioration from other water utilities in Southern California. In the best-case scenario, asset deterioration causes assets to become unserviceable or obsolete. In the worst case, asset failures become a threat to public health and the environment. For instance, the ASCE and EPA estimate that:

- Between 23,000 and 75,000 sanitary sewer overflow (SSO) events occur per year in the United States.
- SSOs caused by blocked or broken pipes result in the release of 10 billion gallons of raw sewage annually.
- Large utility pipeline breaks in the Midwest increased from 250 per year to 2,200 per year over 19 years.
- Leaking pipes lose approximately 7 billion gallons of clean drinking water a day.
- USGS estimates 1.7 trillion gallons of water are lost in the United States per year, at a cost of $2.6 billion.

Figure 2.2 illustrates the impending situation faced by many utilities across the country. Since a large portion of infrastructure was constructed between the years of 1950 and 1990, many of these assets will need to be rehabilitated or replaced in the next 20 to 60 years. These infrastructure needs will continue to grow if maintenance and replacement costs are deferred to future generations.

The City of Simi Valley (City) is using the development of this Asset Management Plan (AMP) as an opportunity to proactively manage its assets and overcome this nationwide trend.

Figure 2.1
EXAMPLES OF WATER AND SEWER ASSET FAILURE
ASSET MANAGEMENT PLAN
CITY OF SIMI VALLEY

ylwd410f1-8343.ai

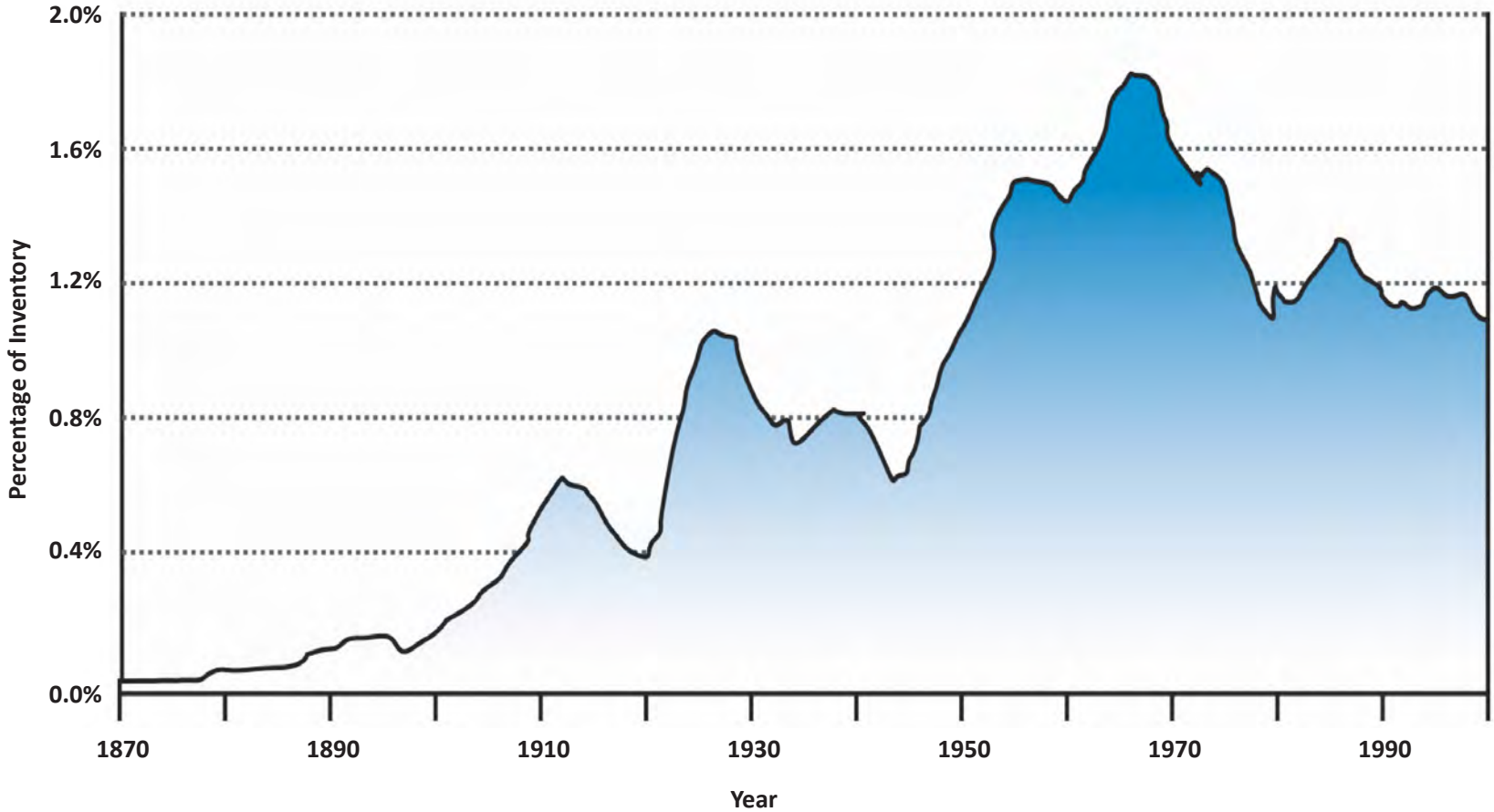


Figure 2.2
HISTORICAL WATER AND SEWER
BELOW-GROUND INFRASTRUCTURE DEVELOPMENT
ASSET MANAGEMENT PLAN
CITY OF SIMI VALLEY

ylwd410f5-8343.ai

2.1.1 Purpose for Asset Management Plan

This AMP is intended to guide the maintenance, repair, and replacement of the City's aboveground and belowground wastewater assets in a cost-effective manner, while meeting the level of service (LOS) and water quality objectives as established in its Mission Statement and as monitored by LOS performance metrics.

The City has an immediate need to further foster and develop its AMP to validate the City's investments in its wastewater facilities. Moreover, this program is intended to serve as a communication tool, conveying strong environmental and fiscal stewardship on the part of the City to its elected officials, customers, and other stakeholders. In this effort, the City has identified a need to accurately predict the cost and timing of rehabilitation and replacement (R&R) projects while minimizing the risk of failure of the City's assets. The program is also intended to provide a conduit for information sharing among City staff while capturing valuable institutional knowledge from its sanitation engineering, planning, operations, and maintenance staff.

2.1.2 Asset Management Methodology

For the preparation of this AMP, a risk-based asset renewal (or reinvestment) prioritization was developed for the City's wastewater assets. Risk corresponds to each discrete asset's potential to impact the City's LOS goals. The magnitude of asset risk potentially impacting the City is estimated (and quantified) by taking the product of two metrics: vulnerability and criticality.

Initially, the risk determinations associated with the City's aboveground assets have been based on the results of the site visits and visual condition assessments. This effort was intended to evaluate general asset condition, need for asset replacement, and the initial risk priority. Only a portion of the City's belowground sewer pipelines have been visually assessed, so the risk-based priorities and renewal needs for the entire wastewater collections system were developed from pipe age information as provided through GIS data, available repair history, and City input.

Based on the results of the AMP, the City will need to budget the necessary capital dollars for near-term rehabilitation and replacement projects, and adjust annual contributions to R&R reserve funds to support longer term needs. Final implementation and timing of the Asset Renewal CIP projects will be confirmed by City management through detailed asset investigations, coordination with other Public Works Department capital needs, and priority-based scheduling of projects.

The estimated project costs presented in Chapter 5 were based on the assumption that each asset will be used until rehabilitation or replacement is needed to prevent a failure. This approach is conservative because there may be situations where an asset could be maintained for a lower cost that would extend the asset's useful life beyond the current

estimates. However, the technologies that are currently available today for ongoing maintenance and structural repairs of wastewater assets are still evolving and better techniques are expected to be available in the future. Thus, the suggested budgeting approach is for asset rehabilitation or replacement with the realization that asset useful life could be optimized with enhanced maintenance and repair practices. As such, there may be an opportunity for the City to maintain assets at a lower cost by applying maintenance and repair techniques that extend the useful life of the City's wastewater assets.

2.1.3 Expected Asset Management Outcomes

The goal of the AMP is to provide the City with an established program to help manage its assets from installation through disposal in a cost-effective manner while ensuring that the City's LOS goals are met. The objectives of the AMP are:

- To evaluate and update the City's existing asset inventory.
- Determine the service lives, evaluated remaining useful lives, and economic remaining useful lives of the assets.
- Identify capital assets in need of replacement funding.
- Develop a timeline of asset replacement years based on the condition assessment.
- Establish the replacement costs of the assets under existing conditions.
- Prioritize the R&R of assets through a risk framework – assessment of the asset's vulnerability and criticality – applied to the wastewater systems.
- Generate asset data to be integrated into the City's maintenance management system, GIS, and other electronic management systems.
- Develop a financial plan and engineer's report that will support a rate increase and associated Proposition 218 process to fund the City's capital renewal needs for the wastewater system.

2.2 CITY OF SIMI VALLEY ASSET MANAGEMENT VISION

An Asset Management Strategy Workshop was held at the City's sanitation offices on August 12, 2010. Level-of-Service Goals, Asset Vulnerability and Criticality Factors, and Performance Measures were proposed during this workshop to guide the development of the AMP. It was determined that the City will follow guidelines developed by the American Water Works Association (AWWA) and Water Environment Federation (WEF) in setting LOS goals and associated performance measures.

2.2.1 Level of Service Goals

A utility's asset management strategy is often developed or refined as a result of the organization's LOS goals. In many cases, departments or groups within a utility have specific LOS goals related to its operations (organizational, financial, and technical).

Ultimately, the performance metrics that will be developed by the City for the monitoring of the AMP should be aligned with the LOS goals as well as the utility's vision and mission statements.

The City's LOS goals for wastewater assets have been based on several criteria, including customer service expectations, regulatory requirements, and the City Public Works Department's mission statement and philosophy. Meeting LOS goals requires the following actions: 1) assessing risks associated with failure or inability of assets to meet their intended function or overall levels of service, 2) making decisions based on risk minimization through proactive planning, and 3) implementing projects that ultimately provide the highest value to its users. In order to implement an effective AMP, the City must minimize life-cycle costs while meeting LOS goals. This involves effectively managing asset vulnerability (i.e., the likelihood of failure), criticality (i.e., the consequence of failure), and risk.

2.2.2 Asset Vulnerability and Criticality Factors

During the Strategy Workshop, the City developed a criticality matrix for scoring the consequence of failure of assets. The criticality matrix is shown in Table 2.1.

Table 2.1 Criticality Matrix
Asset Reliability Assessment and Financial Plan
City of Simi Valley

LOS/Criticality Category	Weight	Negligible = 1	Low = 4	Moderate = 7	Severe = 10
Health and Safety for Public and Employees	25%	No injuries or adverse health effects	No lost-time injuries or medical attention	Lost-time injury or medical attention	Loss of life
Financial Impact	20%	Absorbed within budget line item < $10,000	Requires Purchasing Agent approval $10,000 to $25,000	Requires City Manager approval $25,000 to $100,000	Requires Council approval, new borrowing, or impacts rates > $100,000
Impact on Environment or Regulatory Compliance	10%	100% compliance with permits and no impact on environment	Violation but no enforcement action and/or minor impact on environment	Violation with minor enforcement action and/or moderate impact on environment	Enforcement action with fines and/or major impact on environment
Effect on Service to Customers	30%	No impacts on service delivery or customers	Minor disruption	Short-term impact and/or substantial disruption	Long-term impact and/or area-wide disruption

Table 2.1	Criticality Matrix Asset Reliability Assessment and Financial Plan City of Simi Valley				
LOS/Criticality Category	**Weight**	**Negligible = 1**	**Low = 4**	**Moderate = 7**	**Severe = 10**
Ability to Respond and Return Asset to Service	15%	Redundant asset available or service restored in <2 hours	Service restored in 2 to 8 hours	Service restored in 8 to 24 hours	Not able to restore service for >24 hours

Vulnerability factors were discussed during the Strategy Workshop as being reflective of the current condition, and the likelihood of failure, of each asset. It was agreed to utilize a rating scale of 1 (high-new condition) through 5 (low-unserviceable condition) which is based on industry standards such as the International Infrastructure Management Manual (IIMM) and the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) ratings.

2.2.3 Proposed Performance Measures

During the AMP Strategy Workshop, City staff elected to use performance measures developed by AWWA QualServe as a baseline for developing asset management-related metrics and for consideration in a future Public Works Department-wide performance management program. Several potential performance measures for the asset management activities of the City are shown in Table 2.2. For implementation, a mathematical expression will be developed for each performance metric. For example, the system renewal and replacement rate can be calculated using the following equation:

System Renewal and Replacement Rate (%) =

100 x (Total actual expenditures for renewal and replacement for each asset class/ total present worth for renewal and replacement needs for each asset group)[1].

Table 2.2	Proposed Performance Measures Asset Reliability Assessment and Financial Plan City of Simi Valley
Category	**Metric**
Employee Efficiency and Health	Employee Health and Severity Rate, Training Hours per Employee, Wastewater Treated per Employee
Customer Service	Customer Service Complaints, Customer Service Cost per Account, Billing Accuracy

[1] AWWA, "Benchmarking, Performance Indicators for Water and Wastewater Utilities: Survey Data Analyses Report", 2005

Table 2.2 Proposed Performance Measures Asset Reliability Assessment and Financial Plan City of Simi Valley	
Category	**Metric**
Financial Management	Debt Ratio, Return on Assets, Residential Cost of Sewer Service
Technical/Engineering	Disruptions of Sewer Service, Collection System Integrity
Operations and Maintenance	System Renewal and Replacement Rate, O&M Cost per Account, Sewer Overflow Rate
Regulatory	Wastewater Treatment Effectiveness Rate
Source: AWWA, "Benchmarking, Performance Indicators for Water and Wastewater Utilities: Survey Data Analyses Report", 2005.	

The AMP presents several of the baseline results for these performance measures throughout this report. Over time, the City should continue to track, report, and analyze its performance in these areas to determine areas where improvement is needed and focused efforts should be applied. In addition, the QualServe and Effective Utility Management programs developed by water industry organizations, such as AWWA and WEF, provide benchmarks for the City's performance as compared to other water utilities of similar size and composition. The establishment of a long-term program of Asset Management Vision, LOS Goals, and related Performance Measures will support the continued successful operation, and prevent the deterioration, of the City's vital wastewater assets.

ABOVEGROUND ASSET RELIABILITY ASSESSMENT

3.1 ASSET INVENTORY

The term “aboveground asset” refers to any structure, equipment, or sitework owned and operated by the City of Simi Valley (City), i.e., all assets other than pipes and appurtenances. A draft asset inventory was developed from drawings and an export from the City’s maintenance management system. The inventory objective was to build a data repository at a suitable level of detail for capital-level rehabilitation and replacement (R&R) planning. The inventory was based on a hierarchy of facility, process, and asset. An “asset” was generally defined as a complete physical component of a facility that enables service to be provided, is critical to plant operation, and/or has a value greater than $10,000.

3.2 RELIABILITY ASSESSMENT FINDINGS

3.2.1 Methodology

Carollo Engineers, Inc. (Carollo) conducted a visual condition assessment of aboveground assets on September 14 and 15, 2010. The field effort consisted of a multi-disciplinary engineering team from Carollo led by City staff members Donald Cloud, Randy Alan, Paul Henkey, Jason Denison, and Michael Mantor. In addition, Steve Potter of SRP Engineering was present to relay findings of the ArcFlash and short circuit studies recently conducted.

The discipline engineers evaluated the condition of each asset on a one-through-five ranking scale, based on the International Infrastructure Management Manual (IIMM). In the IIMM, condition is expressed in terms of the amount of repair needed to bring an asset to like-new condition. The definitions for the one-through-five condition ranking system from the IIMM are shown in Table 3.1. The assessments were visual assessments only and did not include diagnostic testing or entry into confined spaces. The Carollo team inquired on anecdotal maintenance and performance history and documented design criteria, installation date, and typical condition parameters that could be used to standardize the procedure for future assessments. Photographs were taken of each asset.

Table 3.1 Asset Condition Assessment Ranking
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Score[1]	Description[1]	Required Repair Percentage[1][2]
1	Very Good Condition	0%
2	Minor Defects	1-10%
3	Maintenance Required to Return to Accepted Level of Service	11-20%
4	Requires Rehabilitation	21-50%

Table 3.1	Asset Condition Assessment Ranking Asset Reliability Assessment and Financial Plan City of Simi Valley	
Score[1]	**Description[1]**	**Required Repair Percentage[1][2]**
5	Asset Unserviceable	>50%

Notes:
1. Adapted from the International Infrastructure Management Manual.
2. Percentage of asset requiring repair: The percentage of the asset value needed to return the asset to a condition ranking of one.

The following sections present the key observations made during the condition assessment. Additional details, including installation year and condition rankings for each asset, can be found in Appendix A.

3.2.2 Headworks

The Bar Screen Building is in need of seismic evaluation for adequate wall anchorage to the wood-framed roof. The roof is in need of replacement. The Odor Control Tower does not work as designed, but it has not been necessary. There is a need, however, for improved ventilation to prevent hydrogen sulfide gases from accumulating in the building overnight and accelerating corrosion. The roll-up doors are typically left open during the day to provide ventilation.

The bar screens require frequent maintenance, and there have been issues with misalignment. The augers on the screenings compactors tend to bind and shear, and plant staff must rebuild them often. Many screenings pass through the Headworks into downstream processes. This is addressed downstream with a rotary screen for sludge, but improvements in the Headworks screening would eliminate the need for the rotary screen and would generally benefit downstream processes. Bar screens with 1/4-inch spacing and combined screenings/compactor units are recommended to replace existing equipment.

3.2.3 Grit Classifiers

The grit chamber exhibits moderate corrosion, with exposed aggregate and spalling noted in places. The grit classifiers function as intended but are aging. Two of the four grit pumps were recently replaced.

3.2.4 Primary Sedimentation Tanks

Advanced deterioration was noted in the Primary Influent Channel. Corrosion was noted in structure and members of the primary sedimentation basins. Primary Sedimentation Basin 3 is scheduled for rehabilitation in 2011. Staff has kept old equipment functional, but the original equipment, now approaching 25 years of age, should be annually evaluated for replacement. The Primary Sludge Pumps are becoming expensive to maintain.

3.2.5 Flow Equalization Basin

Minor corrosion was noted at the Flow Equalization Basins (FEBs). Because the corrosion is similar to that at the Backwash Pond, this may be due to concrete mix. There are numerous superficial cracks that are currently repaired with sealant, and pump bases have spalling concrete. The FEB pumps need rebuilding twice per year and are inefficient. The problems noted here with plastic bag clogs would be alleviated with finer bar screens.

3.2.6 Biological Nutrient Removal

The equipment and structures associated with the Biological Nutrient Removal (BNR) process were generally in good condition, given that major work in this area was conducted in 2005 and 2008. The Flygt submersible mixers have been problematic since installation, each having to be rebuilt three or four times. This issue is expected to be addressed by the manufacturer; therefore, the R&R capital improvement program (CIP) will include phased replacements with the improved model. Surging issues were reported to occur when switching from the Turblex, Inc. (Turblex) blowers to the Spencer Turbine Company (Spencer) blowers, but these issues are also expected to be addressed shortly by the designer. Because the Turblex blowers offer more control and efficiency, all future blower replacements are desired to be of this manufacturer.

The East Blower Building is a former primary sedimentation basin, with aluminum covers and framing added. There is a crack in the electrical room ceiling repaired with epoxy injection, and leaking occurs at conduit penetrations. Leaking also occurs in the warehouse room, which is also part of the former primary sedimentation basin. The warehouse room was observed to be damp and unsuitable for storage of belts and other equipment.

Although the East Blower Building and warehouse room are not continuously occupied facilities, there is intermittent use by plant staff. It is not clear whether these facilities contain adequate egress in the event of a fire or earthquake. Furthermore, the seismic loads on the basin walls can present a hazard to staff. The structure has concrete walkways to tie the basin walls together transversely. Given the age of the facility, the design likely did not incorporate hydrodynamic analysis, which was not a design standard prior to the mid-1980s. Consequently, concrete walkways introduce significant local restraint at the tops of the basin walls that can lead to excessive cracking and potentially localized failure of the wall and/or walkway where a detailed design for this restraint condition has not been provided.

Additionally, water that overtops the adjacent basin walls during an earthquake could create electrical hazards and excessive exposure to pathogenic microorganisms. Conversion of a sedimentation basin into an operational building should, as a minimum, meet the safety, egress, fire, and seismic design requirements of the local building code. These code provisions are adopted and enforced to help secure the life safety of the occupants and/or users of a facility. A study of the use of these facilities should be conducted to ensure that the intent of the building code is met.

3.2.7 Secondary Clarification

Normal wear and corrosion was noted in the Secondary Clarifiers. The return activated sludge (RAS pumps) were recently rebuilt, but there was some concern regarding corrosion in the RAS header. The waste activated sludge (WAS) pumps will need replacement or rehabilitation within the next few years.

3.2.8 Filtration

The Filtration Building exhibited structural damage. A heaving slab and significant cracking was noted an expansion joint. The northwest corner slab has been replaced twice due to settlement. There is a leak at the north end of the structure. The gates are problematic.

The Filter Applied Water Pumps 1, 2, and 4 have undergone many rehabilitations and can no longer be rebuilt. The variable frequency drives (VFDs) for these pumps are obsolete, the motors are not inverter-duty, and they run very hot.

3.2.9 Chlorination/Dechlorination

Seismic evaluation should be conduced on the Chorine Building to ensure adequate wall anchorage. A leaking 3-water line under the slab of the old chlorine contact basin. Slab settlement is occurring at the east side. In the new chlorine contact basin, the sealant has failed at all gates. Welding has failed at the west gate frame brace. Several T-bar panels were blown out with wind and have not been replaced. The chemical feed pumps require frequent rebuilds. Given the critical service of these pumps, they should be replaced with better suited models.

3.2.10 Dissolved Air Flotation Thickener

The dissolved air flotation thickener (DAFT) structures were well-painted and had been rehabilitated with plastic panels. Evidence of leakage was noted on the exterior wall of DAFT 1. A more major crack was noted on DAFT 2, and there was cracking at the pump base. Minor exposed aggregate was observed on the inside perimeter of DAFT 2. Annual inspections are recommended for the structures and equipment in this area.

3.2.11 Digestion

Anaerobic Digesters 1 and 2 have been out of service for many years. Anaerobic Digesters 3 and 4 exhibited cracks and wear on the roof, with possible methane gas leaks to the atmosphere. In several areas on the top slab, a thin layer of concrete had delaminated. Cracking was observed at pump and pipe support pads. The internal piping condition is unknown.

The ferric chemical containment area appeared to be inadequately sized for the tank volume, should the contents spill. The walls were built of concrete masonry blocks without

adequate coating for chemical containment. To maintain plant safety, a project to evaluate and possibly rebuild this is highly recommended.

The sludge circulation pumps and gas circulation compressors have been recently rebuilt. The boiler system has had past failures, and the condition is difficult to monitor. The heat exchanger hot water pumps are nearing the end of their service life. Struvite problems were reported, especially near the screened sludge transfer pumps. This is expected to be addressed as part of an ongoing program to replace affected pipe with glass-lined pipe.

The sludge holding tank exhibited exposed aggregate and roof corrosion beyond repair. The asphalt top should be replaced with concrete. The grout at the cover curbs is in poor condition.

3.2.12 Dewatering

The Belt Filter Presses are functional but aging. A phased replacement schedule is recommended for these, which will allow parts from the early replacements to be used to keep older presses working. The conveyors are showing signs of metal fatigue and should be evaluated annually.

3.2.13 Plant Power

The ArcFlash and Short Circuit studies revealed life safety concerns with many of the switchgear and motor control centers (MCCs). At present, maintenance personnel must shut down an entire bank of equipment in order to work on one piece of equipment. This creates a large coordination effort with regard to both staff and plant process. The main breakers are highly critical, as failure of one could cause extensive shutdowns. Rather than replacing the equipment directly, a preliminary design study should be conducted to evaluate consolidation and relocation of MCCs. The VFD technology should also be reviewed. Motor sizes 50 hp and up will dictate newer 18-pulse VFDs. The current electrical rooms will not support the larger equipment.

3.2.14 Reclaimed Water Pump Station

Because the Reclaimed Water Pump Station is jointly owned, its renewal needs were not included in this CIP. It was noted that the tanks cannot operate with full redundancy with the current configuration. Upgrades to piping, valving, and electronic controls are recommended.

3.2.15 Lift Stations

The Arroyo and Big Sky lift stations were in very good condition. The Wood Ranch lift station was under construction at the time of assessment. The expected useful life of each of the submersible sewer lift pumps is less than 10 years, even when well maintained.

3.3 VULNERABILITY

The vulnerability metric reflects the "likelihood of asset failure." Failure can occur from physical failure, performance failure, or technological obsolescence. The vulnerability assessment considered physical failure only, i.e., asset mortality. The vulnerability of an asset is calculated as the inverse of the Evaluated Remaining Useful Life (EvRUL), described below. For example, an asset with many years EvRUL has a low vulnerability and vice versa. While vulnerability is calculated based on EvRUL, the Economic Remaining Useful Life (EcRUL), also described below, was used to develop CIP projects and timing.

3.3.1 Original Useful Life

Original Useful Life is the number of years an asset is expected to be in service as a function of asset type (i.e., mechanical, structural, electrical, instrumentation and control). Original Useful Life is used to develop different estimates of remaining useful life, described below. The Original Useful Life estimates for different types of assets are presented in Table 3.2.

Table 3.2 Original Useful Life Based on Asset Category
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Asset Category	Original Useful Life[1]
Civil/Sitework	50
Structural	
General	50
Concrete	50
Fiberglass	25
Steel	25
Plastic	10
Mechanical	
General/Other	20
Valves	35
Pumps – Water	20
Pumps – Wastewater	15
Chemical Equipment	15
Coolers/ACs/Fans	15
Electrical	30
Instrumentation	15

Notes:
1. These defaults are based on values from the International Infrastructure Management Manual (IIMM), Edition 2006, USEPA guides, other industry references, and Carollo project experience.

3.3.2 Evaluated Remaining Useful Life

The EvRUL is based on the current condition of the asset and is the estimated remaining number of years until the physical failure of the asset. EvRUL does not take into account the actual age of the asset; rather it reflects an estimate of remaining useful life based on the observed condition alone. EvRUL was calculated as:

$$(1 - \text{Condition Fraction}) \times \text{Original Useful Life}$$

Condition fractions are shown in Table 3.3. The relationship between condition ranking and condition fraction reflects the logic that once an asset deteriorates to a below-average condition, its probability of failure increases and its remaining years in service decline more rapidly than for assets that are maintained in good condition.

Table 3.3 Asset Condition Fraction
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Condition as Defined in Table 3.1	Condition Fraction
1	0
2	0.10
3	0.20
4	0.40
5	0.90

3.3.3 Economic Remaining Useful Life

The Economic Remaining Useful Life (EcRUL) parameter aims to indicate the cost-based optimum time to rehabilitate an asset. EcRUL is an estimate of the point in an asset's service life before the maintenance costs and the likelihood of failure substantially increase, when the asset could still be restored to like-new condition with reasonable reinvestment or be replaced with a newer model offering improved efficiency. For example, a concrete structure in average condition can often be rehabilitated with crack sealing and coating, but if the structure is allowed to deteriorate too far, corrosion may extend to its members and require a rehabilitation effort with costs similar to that of a new building.

Based on Carollo observation of utilities and the management/reinvestments in assets, this period of time often occurs after the asset value reaches approximately half of its original value, when the cost for maintenance or rehabilitation of the asset begins to increase considerably. EcRUL is therefore calculated in from the following equation, which begins with half of the original useful life:

$$(\text{Original Useful Life}/2) - (\text{Original Useful Life} \times \text{Condition Fraction})$$

The precise optimum time for reinvestment or asset renewal cannot be predicted for any asset. EcRUL provides the City with a "trigger point" to conduct a rehabilitation versus replacement analysis (prior to incurring the actual expenses), as well as a trigger point for intervention before the likelihood of failure increases substantially.

3.4 CRITICALITY

During the Strategic Visioning Workshop, the City developed a criticality matrix for scoring the consequence of failure of assets. The criticality scoring system divides probable "consequences of failure" into five categories:

- Health and Safety for Public and Employees.
- Financial Impact.
- Impact on Environment or Regulatory Compliance.
- Service Delivery and Effect on Customers/Public Confidence.
- Ability to Respond and Return Asset to Service.

The criticality matrix is shown in Table 3.4. This scale is adopted from the International Infrastructure Management Manual, New Zealand National Asset Management Steering Group, and the Institute of Public Works Engineering of Australia (2006). The category weighting, consequence criteria, and scores were customized during the Strategic Visioning Workshop to meet City mission and objectives. The criticality of an asset is the sum of the individual rankings in each of the five categories multiplied by their respective weighting factor.

3.4.1 Risk Assessment

Risk of an asset is a measure of the impact of asset failure on the overall system. By quantifying and assessing the risk of failure or inability of an asset to meet its intended function or achieve its LOCK-OUT-STOP (LOS goals), R&R projects can be selected and implemented to mitigate the risk.

Just as risk is expressed economically as the product of cost and chance, risk is calculated in this analysis as the product of the consequence of failure and the likelihood of failure, or:

$$\text{RISK} = \text{Criticality} \times \text{Vulnerability}$$

At a minimum, assets with higher risk ratings must be closely monitored and targeted for corrective or preventative action, including maintenance, rehabilitation, or replacement.

Table 3.4 Criticality Matrix
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Level of Service/ Criticality Category	Weight	Negligible=1	Low=4	Moderate=7	Severe=10
Health and Safety for Public and Employees	25%	No injuries or adverse health effects	No lost-time injuries or medical attention	Lost-time injury or medical attention	Loss of life
Financial Impact	20%	Absorbed within budget line item < $10,000	Requires Purchasing Agent approval $10,000 to $25,000	Requires City Manager approval $25,000 to $100,000	Requires Council approval, new borrowing, or impacts rates > $100,000
Impact on Environment or Regulatory Compliance	10%	100% compliance with permits and no impact on environment	Violation but no enforcement action and/or minor impact on environment	Violation with minor enforcement action and/or moderate impact on environment	Enforcement action with fines and/or major impact on environment
Effect on Service to Customers	30%	No impacts on service delivery or customers	Minor disruption	Short-term impact and/or substantial disruption	Long-term impact and/or area-wide disruption
Ability to Respond and Return Asset to Service	15%	Redundant asset available or service restored in < 2 hours	Service restored in 2 to 8 hours	Service restored in 8 to 24 hours	Not able to restore service for > 24 hours

Table 3.5 shows the highest risk aboveground assets. As can be seen in the table, the highest risk was found to be in the ferric containment area, largely due to the health and safety criticality factor. Also at high risk were the electrical gear previously identified in the ArcFlash and short circuit study. Remaining high risk assets vary between those with very high criticality and those with moderate criticality scores but high vulnerability due to condition or short service life. The full listing of asset criticality, vulnerability, and risk scores can be found in Appendix B.

Table 3.5 Highest Risk Aboveground Assets
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Process	Asset	Vulnerability	Criticality	Risk
Digestion	Ferric Chloride Containment Area	0.40	5.05	2.02
Plant Power	MCC-B1, B2, C1, C2, D, E, F, G	0.33	5.95	1.98
Plant Power	Automatic Transfer Switch E	0.33	4.6	1.53
Plant Power	Switchboard GEN	0.33	3.85	1.28
Filtration	Applied Pump VFD Nos. 1, 2, and 3	0.67	1.9	1.27
Digestion	Waste Gas Burner	0.11	5.8	0.64
Headworks	Headworks Effluent Box	0.20	2.65	0.53
Lift Stations	Arroyo Lift Station Submersible Pumps	0.16	3.25	0.52
Lift Stations	Big Sky Lift Station Submersible Pumps	0.16	3.25	0.52
Lift Stations	Wood Ranch Lift Station Submersible Pumps	0.14	3.25	0.46
Digestion	Waste Gas Burner	0.08	5.8	0.48
Plant Power	Distribution Panel DEP	0.11	3.55	0.39
Plant Power	MCC-DCC	0.06	5.95	0.33
Chlor/Dechlor	Sodium Hypochlorite Feed Pump Nos. 1, 2, and 3	0.08	3.85	0.32
Grit Classifiers	Grit Pump No. 3	0.11	2.8	0.31
Plant Power	Caterpillar Generator	0.07	4	0.30
Filtration	Applied Pumps #1, 2, and 4	0.11	2.65	0.29

BELOWGROUND ASSET RELIABILITY ASSESSMENT

4.1 ASSET INVENTORY

The general principles of asset management for aboveground assets apply equally to belowground infrastructure assets, also known as buried or linear assets. However, the implementation of asset management for belowground infrastructure is unique because of the physical characteristics of the assets themselves, the data repositories and data quality that is available, and the degree to which the condition of buried assets can be determined.

The methodologies that were used to evaluate the City of Simi Valley's (City's) belowground sewer infrastructure are based on literature reviews and represent current practices that are commonly applied within wastewater asset management programs. The methodologies described below are consistent with those used to evaluate aboveground assets to assist the City in comparing different asset groups when allocating renewal funds.

Belowground asset data on sewer pipelines and manholes was obtained from the City's geographic information system (GIS) database as well as spreadsheets developed in previous projects conducted by the City. For pipelines, the attributes of diameter, material, and age are the most useful for a desktop analysis of pipeline condition, so wherever possible, this information was populated using the information available from the City. City staff assisted in completing and correcting sewer pipeline data as much as possible to develop a complete analysis of the belowground assets. Several data gaps still exist in pipe diameters, material types, and installation years that will continue to be refined and corrected by City staff over time.

A summary of existing sewer pipeline information is presented on Figures 4.1, 4.2, and 4.3 by material type, installation year, and pipe diameter.

4.2 RELIABILITY ASSESSMENT

The City performed an inspection and condition assessment of nearly 50 miles of sewer pipelines in 2008 as part of the "Sewer Collection System Asset Evaluation and Rehabilitation Plan" conducted by Kennedy Jenks. Additional condition assessment was not performed on the belowground assets during this project due to the extent of this recent trunk sewer study and the limited time available to complete the analysis. For sewer pipelines, the condition assessment is usually performed with closed circuit television (CCTV) cameras that inspect the interior of the pipes and rate structural and operations and maintenance (O&M) defects based on the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP). The City's current process of cleaning all of its sewer pipes approximately every 3 years, and CCTV recording as needed, provides valuable condition assessment information that can be utilized in the future for updating and refining the asset condition ratings. Condition ratings

Figure 4.1 Feet of Sewer Pipe by Material Type

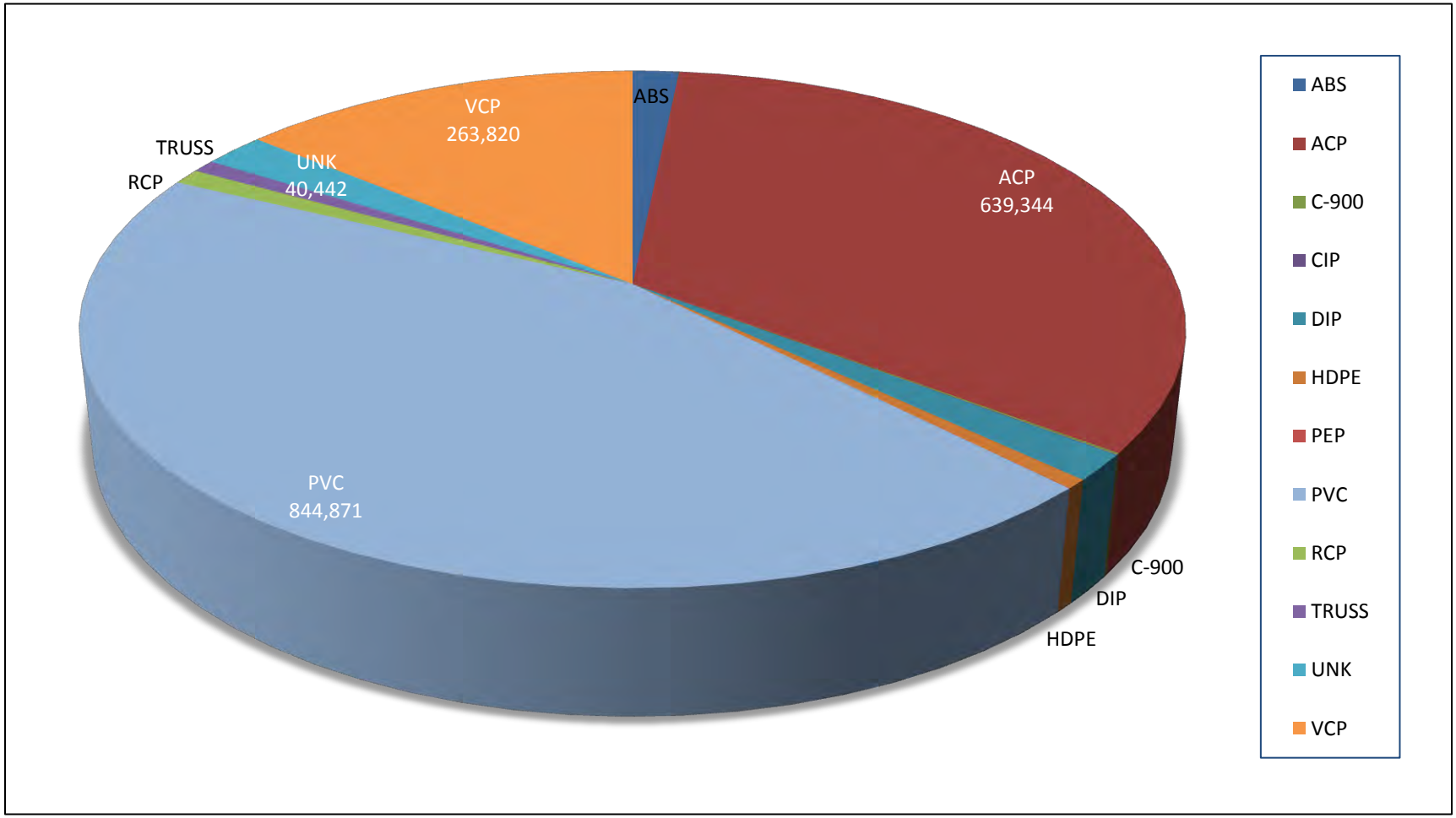


Figure 4.2 Feet of Sewer Pipe by Installation Year

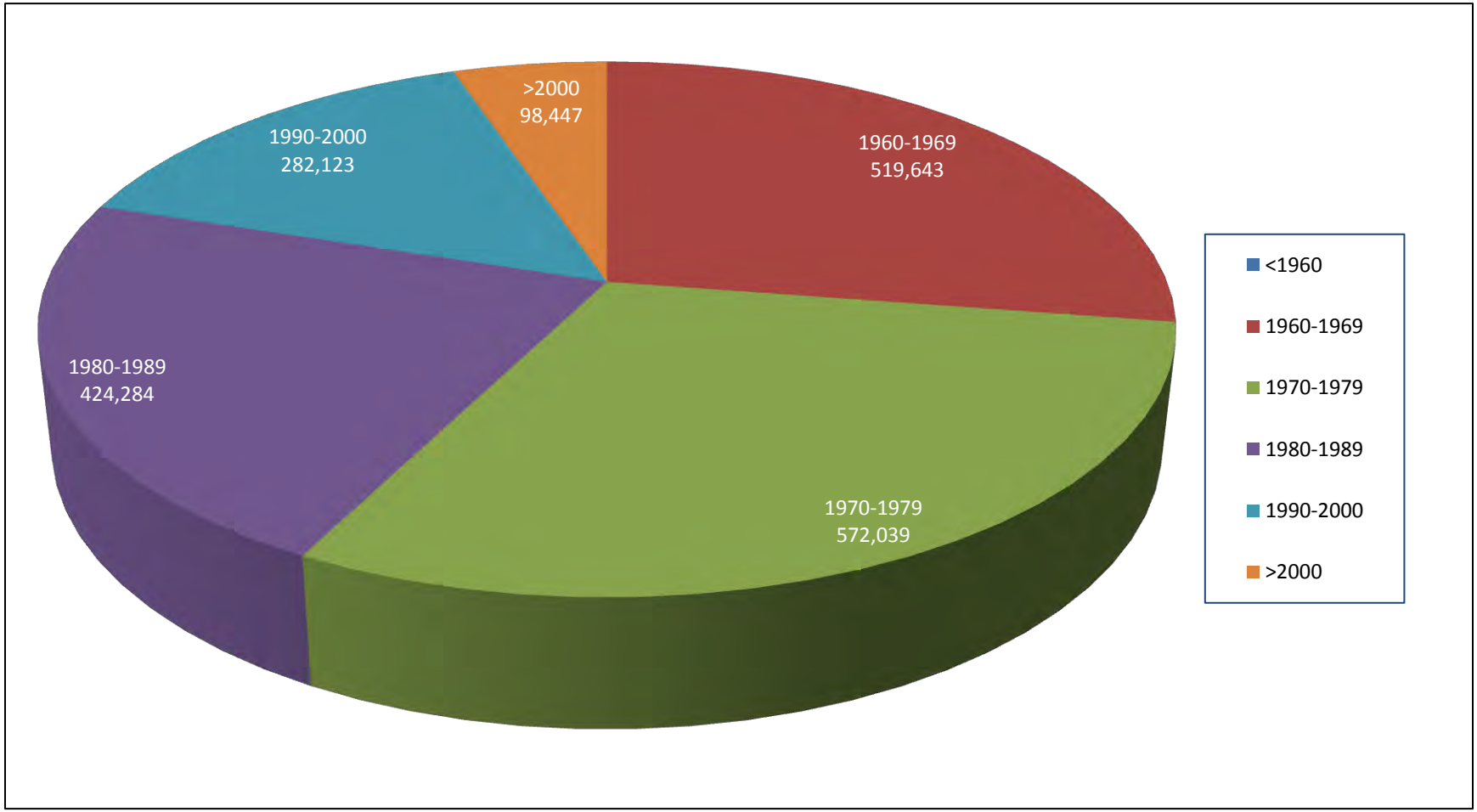
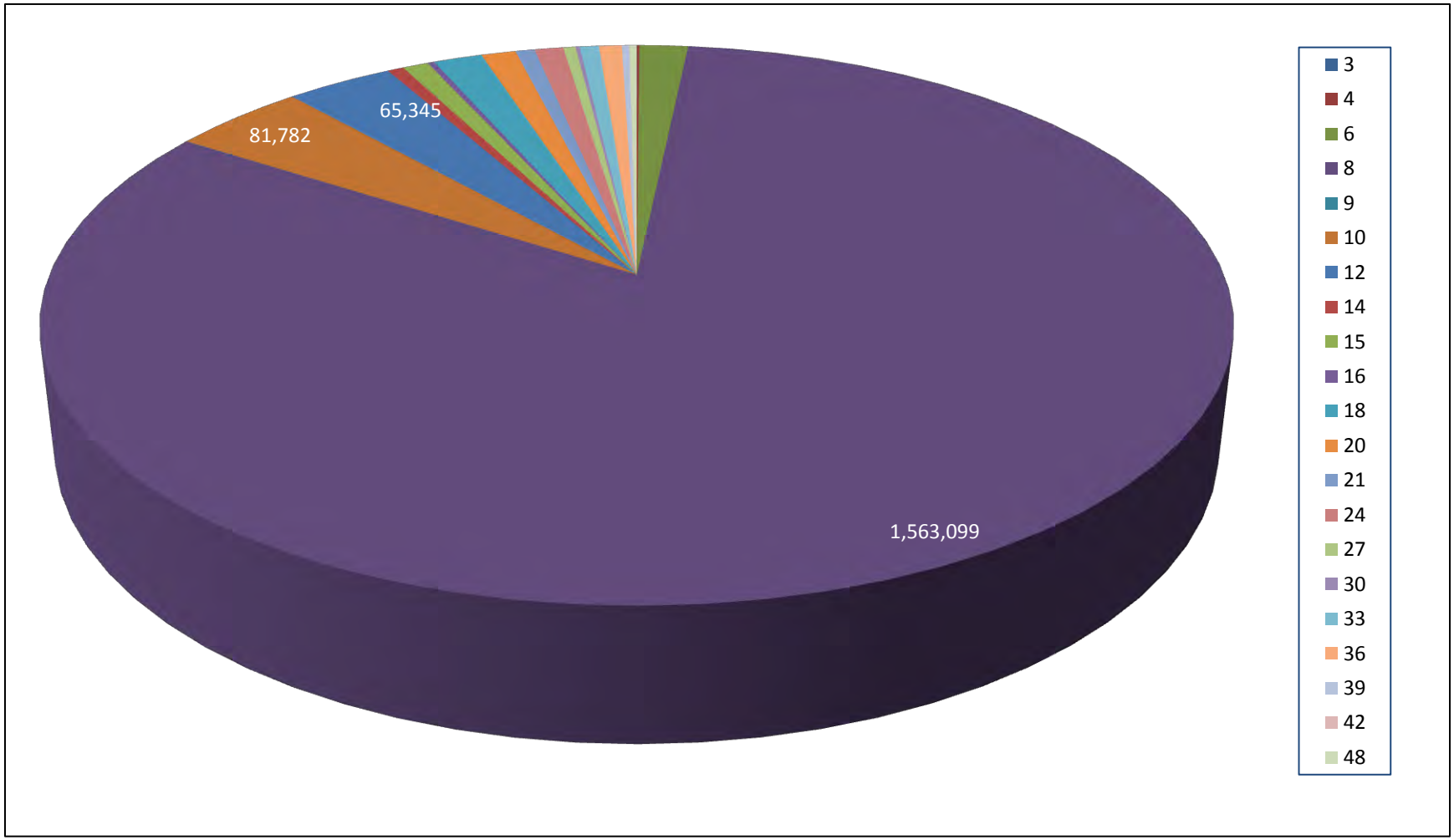


Figure 4.3 Feet of Sewer Pipe by Diameter



should also be further refined based on the available repair and failure history that should be tracked in a CMMS or other maintenance management system.

4.3 CRITICALITY

Criticality describes the "consequence of failure," and is a measure of the resulting outcome when a particular asset fails to meet its intended purpose. Criticality rankings were assigned to the City's linear assets based on the methodology described below. While the criticality scoring system was structured similar to that used for aboveground assets, specific criteria were developed for each of the belowground asset systems. Pipe criticality rankings can be established based on a variety of the following factors:

- Number of customers served (measured indirectly by the capacity of the pipeline).
- Significance of customers served (such as one of the customers on the City's critical customer list).
- Level of redundancy that is available as backup for the asset.
- Environmental consequence of failure.
- Social/economic consequence of failure.

The factors that affect criticality can be grouped into the four areas listed below. Adjustments to the rankings were established in collaboration with City staff during a Strategy Workshop to assign priorities and weightings for each category:

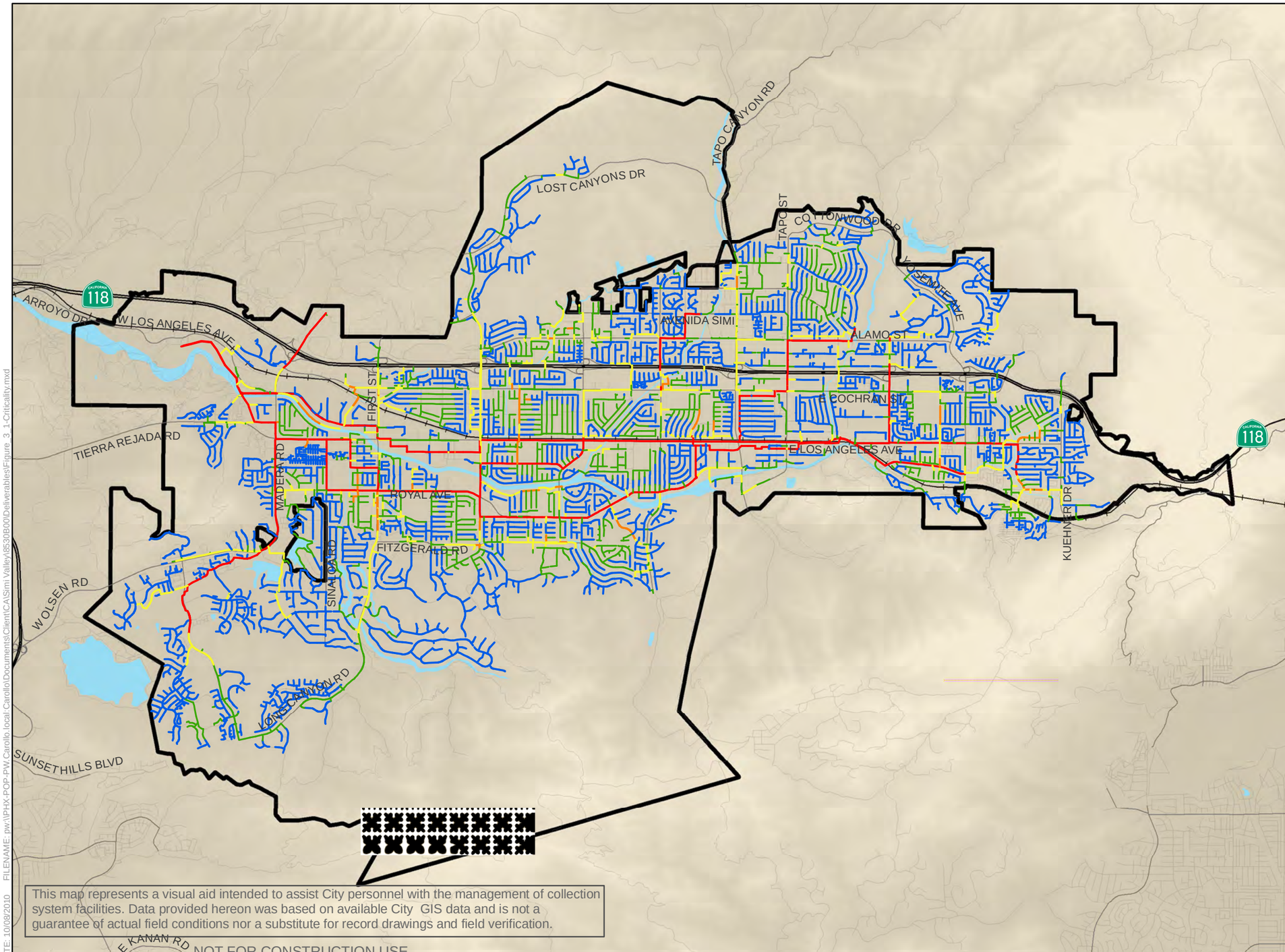
- Public Health and Safety.
- Effect on Customers.
- Environmental.
- Cost of Repair.

4.3.1 Sewer Main Criticality

Criticality for belowground assets was determined using a similar matrix of categories, weights, and factors as was applied for aboveground assets. However, it was determined during the Strategic Visioning Workshop that for sewer pipelines, the category of "Ability to Respond and Return Asset to Service" was identical to "Service Delivery and Effect on Customers" and, accordingly, the category was removed. Breakpoints between the scoring factors were determined based on pipeline sizes, proximity to railroads or major roads, distance to major stormwater drainage areas, and other factors that could be calculated for all pipes using available GIS data. The criticality matrix for belowground assets is shown in Table 4.1 and a map of sewer pipeline criticality is shown on Figure 4.4.

Table 4.1 Belowground Criticality Matrix
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Level of Service/ Criticality Category	Weight	Negligible=1	Low=4	Moderate=7	Severe=10
Health and Safety for Public and Employees	30%	Pipes 6 inches and smaller	Pipes 12 inches and smaller	Pipes larger than 12 inches or within 1,000 feet of critical facilities	No pipes
Financial Impact	25%	No pipes	Pipes 12 inches and smaller	Pipes 18 inches and smaller	Pipes larger than 18 inches
Impact on Environment or Regulatory Compliance	15%	No pipes	Pipes 8 inches and smaller	Pipes 12 inches and smaller or within 100 feet of stormwater drainage area	Pipes larger than 12 inches
Effect on Service to Customers	30%	No pipes	Pipes 8” and smaller	Pipes 12 inches and smaller or within 50 feet of railroads or major roads	Pipes larger than 12 inches



This map represents a visual aid intended to assist City personnel with the management of collection system facilities. Data provided hereon was based on available City GIS data and is not a guarantee of actual field conditions nor a substitute for record drawings and field verification.

NOT FOR CONSTRUCTION USE

DATE: 10/08/2010 FILENAME: pw:\\PHX-POP-PW.Carollo.local:Carollo\Documents\Client\CA\Simi Valley\9530B00\Deliverables\Figure_3_1-Criticality.mxd

LEGEND

Sewer Pipeline Segments

- 1 - Low (<4)
- 2 - Medium Low (4 - 5)
- 3 - Medium (5 - 6)
- 4 - High (6 - 8)
- 5 - Severe (>8)
- Freeways
- Major Roads
- Local Roads
- Railroad
- City Limits
- Bodies of Water

N

0 0.5 1 2

Miles

Figure 4.4
Criticality

Asset Reliability Assessment
and Financial Plan
City of Simi Valley

CITY OF SIMI VALLEY

carollo Engineers...Working Wonders With Water™

4.4 VULNERABILITY

The vulnerability metric reflects the “likelihood of asset failure.” Failure can occur from physical failure, performance failure, or technological obsolescence. The vulnerability assessment considered physical failure only of belowground assets, i.e., asset mortality. The vulnerability of an asset is calculated as the inverse of the remaining useful life. For example, an asset with many years of remaining useful life has a low vulnerability and vice versa.

The useful life of pipes varies based on several factors other than pipe age and material, but these other factors are often difficult to quantify. Other factors affecting pipe failures include:

- Pipe bedding that is substandard.
- Loading from traffic above pipes in the street.
- High groundwater levels.
- Freeze and thaw action of surrounding soils.
- Soil conditions and corrosivity.
- Construction methods, primarily poor quality work.
- Pipe lining issues.
- Level of and need for cathodic protection.
- Operating beyond recommended limitations of material.

Because the useful life of a pipeline asset depends upon a large variety of factors that are often not well defined (or understood), pipeline age is often used as an indicator of condition and therefore remaining life.

4.4.1 Useful Life of Sewer Mains

Table 4.2 lists the useful life and replacement period for the material types of sewer pipe in the City’s system based on industry-reported estimated life expectancies and City experience. The useful life is a measure of the number of years expected until a failure may occur and the pipe needs to be rehabilitated or replaced. Generally, the useful life indicates a timeframe in which 50 percent of pipelines would need to be rehabilitated or replaced prior to this length of time and 50 percent would need rehabilitation afterwards.

Table 4.2 Expected Useful Life for Sewer Pipelines Asset Reliability Assessment and Financial Plan City of Simi Valley	
Pipe Material	**Useful Life (years)**
Acrylonitrile Butadiene Styrene Plastic (ABS)	70
Asbestos Cement Pipe (ACP)	50
Asbestos Cement Pipe (ACP) for Pipe 8-inch diameter or less	70
Cast Iron Pipe (CIP)	40
Ductile Iron Pipe (DIP)	75
Polyvinyl Chloride Plastic (PVC)	70
Reinforced Concrete Pipe (RCP)	60
Vitrified Clay Pipe (VCP)	75
High Density Polyethylene (HDPE)	70
Plastic Truss Pipe (TRUSS)	70
C-900 PVC Pipe (C-900)	70
Polyethylene Pipe (PEP)	70
Unknown Material (UNK)	70

The useful life estimates selected for the City were based on industry research from AWWA, WEF, and the Water Research Foundation (WRF). Additional information and research from other Carollo asset management clients and other utilities, such as the Los Angeles Department of Water and Power, that have published the useful life estimates they have used in their asset management programs. These useful life estimates should be updated and refined over time as additional information is collected on the actual performance of the City's sewer pipelines. For example, based on CCTV inspections and condition assessment performed during the Sewer Collection System Asset Evaluation and Rehabilitation Plan, it was determined that the City's large diameter asbestos cement pipes (ACP) have been deteriorating rapidly and their useful life is estimated at 50 years. However, smaller diameter ACP pipes (8-inch diameter or less) have not been deteriorating as rapidly, and were therefore given an expected useful life of 70 years. For sewer pipes of unknown material, the useful life for polyvinyl chloride (PVC) was assumed because this was the most common pipe material in the system.

Figure 4.5 shows the projected replacement year of sewer pipelines based on the calculation of estimated remaining useful life. Figure 4.6 illustrates the vulnerability of sewer pipelines as calculated based on the inverse of the remaining useful life.

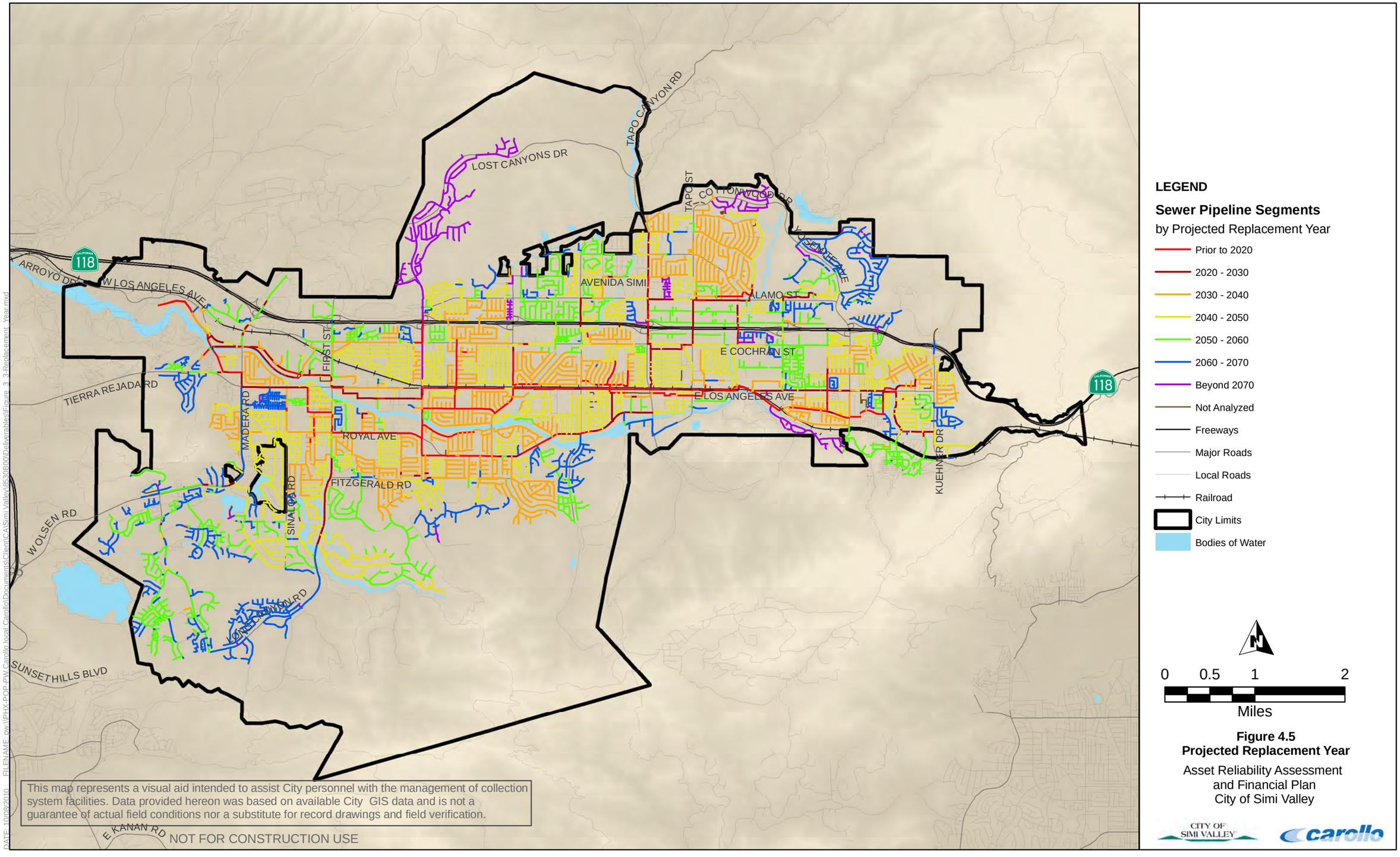


Figure 4.5
Projected Replacement Year

Asset Reliability Assessment
and Financial Plan
City of Simi Valley

CITY OF SIMI VALLEY
carollo

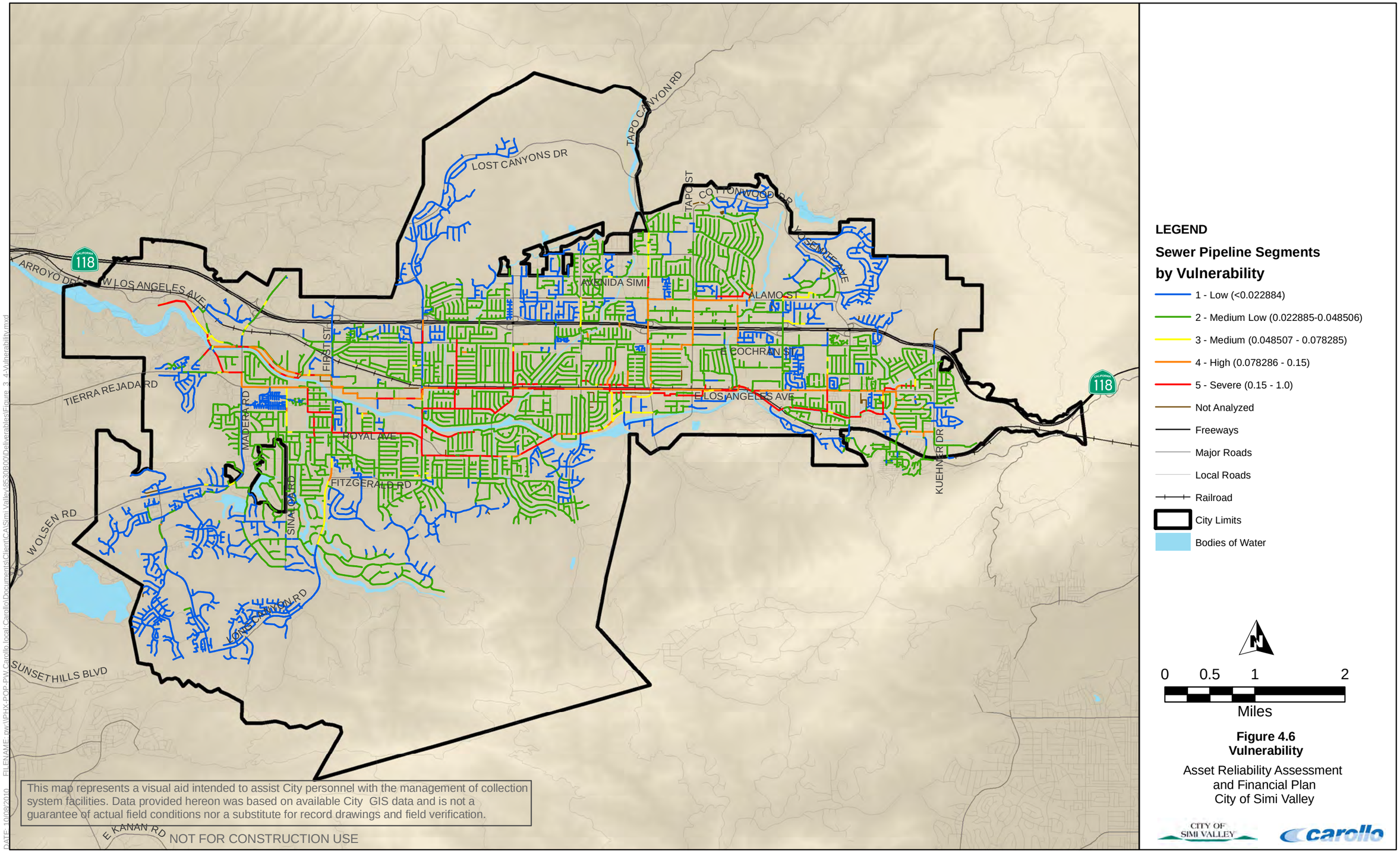


Figure 4.6
Vulnerability

Asset Reliability Assessment
and Financial Plan
City of Simi Valley

DATE: 10/08/2010 FILENAME: pw:\\PHX-POP-PW.Carollo.local:Carollo\Documents\Client\CA\Simi Valley\65308000\Deliverables\Figure_3_4-Vulnerability.mxd

4.4.1.1 Useful Life of Sewer Manholes

The useful life of sewer manholes is generally longer than the useful life of sewer mains. This can also be affected by the materials used in the construction of the manholes. Because the City's GIS does not contain specific information on the manhole materials, linings, construction techniques, etc., a single original useful life of 75 years was used for all manholes. As recommended for sewer pipe useful life estimates, the City should continue to adjust and refine this estimate as additional information becomes available.

4.5 RISK ASSESSMENT

Risk is the product of the vulnerability and criticality rankings. The vulnerability and criticality values were calculated for buried assets utilize the same methodology that is being used for aboveground assets. By using the same methodology, the City can better evaluate the risk of pipeline-related assets as compared to treatment or other remote facility assets.

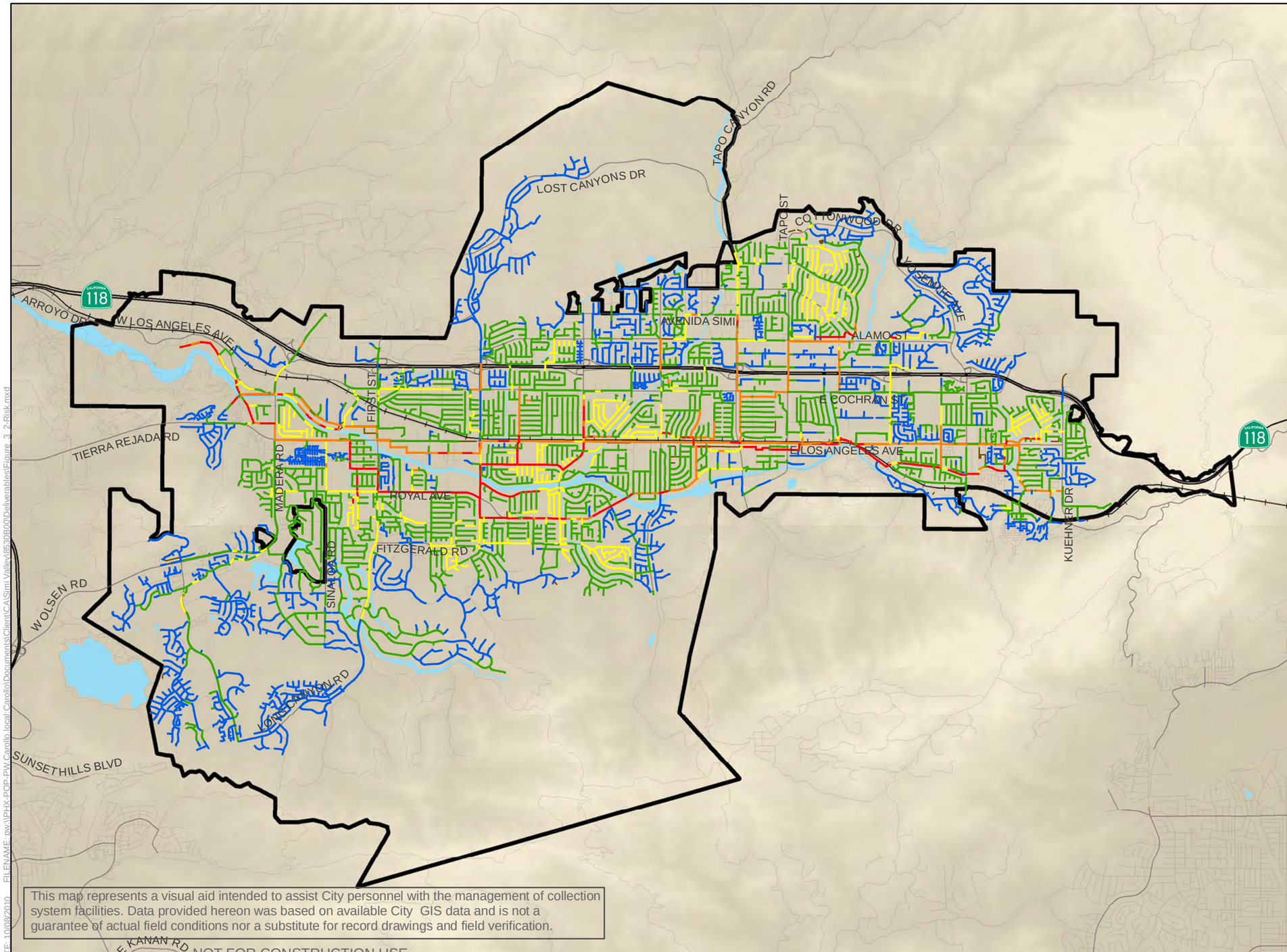
The vulnerability, criticality, and overall risk values were quantified in a relative risk scale of one, representing the lowest risk assets, and five, representing the highest risk. Figure 4.7 is a map of the City with the pipes color-coded to show the assets with the greatest potential risk of failure. These assets with the highest risk should be targeted for further inspection, repair, or replacement. The highest risk belowground sewer assets are shown in Tables 4.3.

Table 4.3 Highest Risk Belowground Sewer Assets
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Feature ID	Street Name	From Manhole	To Manhole	Length (ft.)	Size (in.)	Material	Install. Year	Risk
L91047	ROYAL AVE	L9-143	L9-142	396	24	ACP	1961	9.1
L91046	ROYAL AVE	L9-172	L9-147	335	24	ACP	1961	9.1
L91045	ROYAL AVE	L9-147	L9-146	320	24	ACP	1961	9.1
L91019	ROYAL AVE	L9-171	L9-145	300	24	ACP	1961	9.1
L91012	ROYAL AVE	L9-145	L9-170	120	24	ACP	1961	9.1
L91011	ROYAL AVE	L9-144	L9-143	231	24	ACP	1961	9.1
L101054	ROYAL AVE	L10-149	L10-141	406	24	ACP	1961	9.1
L101024	ERRINGER	L10-149	L10-141	324	20	ACP	1961	9.1
L101023	ERRINGER	L10-141	L10-131	354	20	ACP	1961	9.1
L101022	ROYAL AVE	L10-131	L10-120	400	24	ACP	1961	9.1
L101021	ROYAL AVE	L10-120	L10-118	301	24	ACP	1961	9.1
L101020	ROYAL AVE	L10-118	L10-117	297	24	ACP	1961	9.1
L101019	ROYAL AVE	L10-117	L10-116	300	24	ACP	1961	9.1
L101018	ROYAL AVE	L10-116	L10-115	204	24	ACP	1961	9.1
L101002	ROYAL AVE	L10-114	L9-148	421	24	ACP	1961	9.1
O61008	UNK	BNODE	O6-124	75	33	ACP	1962	9.1
K101004	ERRINGER	K10-104	L10-149	339	20	ACP	1961	9.1
L91012	ROYAL AVE	L9-170	L9-144	52	24	ACP	1961	9.1
L91019	ROYAL AVE	L9-146	L9-171	70	24	ACP	1961	9.1
L91046	ROYAL AVE	L9-148	L9-172	10	24	ACP	1961	9.1
N71038	E EASY ST	N7-122	N7-113	359	39	ACP	1971	8.3

Table 4.3 Highest Risk Belowground Sewer Assets
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Feature ID	Street Name	From Manhole	To Manhole	Length (ft.)	Size (in.)	Material	Install. Year	Risk
M81095	5TH ST	M8-169	M8-159	376	24	ACP	1962	7.6
N71042	UNK	N7-128	N7-119	396	12	ACP	1963	6.3
M81094	5TH ST	M8-159	M8-130	366	24	ACP	1962	5.7
M81085	VENTURA	M8-172	M8-171	356	24	ACP	1962	5.7
N61030	UNK	N6-130	N6-121	406	27	ACP	1962	5.7
N61027	UNK	N6-103	N6-101	271	27	ACP	1962	5.7
O61032	UNK	O6-113	O6-108	446	33	ACP	1962	5.7
O61003	UNK	O6-124	O6-121	312	33	ACP	1962	5.7
P51004	UNK	P5-101	P5-103	543	33	ACP	1962	5.7
P61017	UNK	P6-110	P6-102	466	33	ACP	1962	5.7



LEGEND

Sewer Pipeline Segments by Risk

- 1 - Low (<0.1)
- 2 - Medium Low (0.1-0.2)
- 3 - Medium (0.2-0.5)
- 4 - High (0.5-2.0)
- 5 - Severe (2.0-10.0)
- Not Analyzed
- Freeways
- Major Roads
- Local Roads
- Railroad
- City Limits
- Bodies of Water

N

0 0.5 1 2

Miles

Figure 4-7
Risk

Asset Reliability Assessment
and Financial Plan
City of Simi Valley

CITY OF SIMI VALLEY

carollo

DATE: 10/08/2010 FILENAME: pw:\\PHX-POP-PW.Carollo.local:Carollo\Documents\Client\CA\Simi Valley\9830B00\Deliverables\Figure_3_2-Risk.mxd

Chapter 5

ASSET REHABILITATION AND REPLACEMENT COST EVALUATION

5.1 GENERAL

The replacement values/costs presented within this report are estimates of the total project cost to purchase and install similar assets in today's dollars. Final replacement project costs will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, renewal schedules, and other variable factors. Consequently, the final replacement cost may vary from the estimates presented within this document. It is recommended that the City of Simi Valley (City) confirm the estimated project costs during preliminary and final engineering for all projects.

The following assumptions were used for the replacement cost estimates:

- The costs are presented as present value based on an Engineering News Record Construction Cost Index (ENR CCI) number of 8952 (20-Cities Average Index, December 2010).
- The opinion of probable cost was prepared in accordance with the guidelines of the AACE International (the Association for the Advancement of Cost Engineering) for a Class 4 estimate. According to the definitions of AACE International, the "Class 4 Estimate" is defined as:

  "CLASS 4 ESTIMATE. Generally prepared based on limited information and subsequently have fairly wide accuracy ranges. They are typically used for project screening, determination of feasibility, conceptual evaluation, and preliminary budget approval. Typically, engineering is from 1 to 15 percent complete. Class 4 estimates are prepared for a number of purposes, such as but not limited to detailed strategic planning,…confirmation of economic and/or technical feasibility, and preliminary budget approval or approval to proceed to next stage. The typical expected accuracy range for this class estimate is -15 percent to -30 percent on the low side and +30 percent to +50 percent on the high side."

Replacement costs for both aboveground and belowground assets are comprised of both direct and indirect costs. These factors and assumptions are described in the following sections.

When rehabilitation is an option for an asset, the cost of rehabilitation may be less than the stated replacement costs. However, replacement costs provide the City with an upper benchmark for setting the Asset Renewal capital improvement program (CIP) budget. Rehabilitation costs, in addition to replacement costs, have been estimated for all sewer pipelines due to the materials used in the City's current sewer collection system that would be cost prohibitive to replace and unnecessarily inflate the projected rehabilitation and replacement (R&R) CIP costs. In either case, the renewal strategy (e.g., rehabilitation

versus replacement) for both belowground and aboveground wastewater assets should be further optimized as the asset management program (AMP) develops and the City matures in its risk-based asset management planning process.

5.2 ABOVEGROUND ASSETS

5.2.1 Cost Basis and Assumptions

Replacement values are comprised of both direct and indirect costs. Descriptions of each contingency and its associated factor are presented in Table 5.1 on the following page. Direct costs were assembled from a variety of sources and are the costs directly attributed to the physical make-up of the assets (e.g., site development, materials, site dewatering, facilities, equipment, piping, electrical/instrumentation/controls, installation and labor, etc.). Because the asset inventory is comprised only of the important and/or high cost assets, remaining components are accounted for in a factor termed “ancillary support.” This factor encompasses items such as sump pumps, seal water pumps, small valves, service-air piping, hoses, etc. The lumped value of these assets is adjusted according to best professional judgment and usually amounts to approximately 20 percent of the sum of the itemized asset costs; therefore, a 20-percent ancillary cost factor is applied to each asset. Indirect costs were then applied, including demolition, general conditions, contractor overhead and profit, sales tax, engineering/legal/administration, and construction management.

5.2.2 Cost Summary

Table 5.2 presents the overall cost valuation for aboveground assets. The total shown is the sum of the individual asset replacement costs for all aboveground assets in the AMP asset inventory and does not include land value. This total is not the same as the recommended CIP expenditures because not all of the assets are due for renewal during the CIP planning timeframe.

Table 5.2 Cost Summary for Aboveground Assets
Asset Management Plan
City of Simi Valley

Facility	Estimated Total Replacement Cost(1)
Wastewater Treatment Plant and Lift Stations	$155,500,000

Notes:
(1) Estimated replacement costs are presented in 2010 dollars at the 20-cities average ENR of 8952. These costs include direct and indirect cost factors to estimate the total project cost to replace an asset in-kind. Costs are prepared in accordance with AACE International Class 4 estimates, with an expected accuracy range of -30% to 50%.

Table 5.1 Project Cost Factors
Asset Management Plan
City of Simi Valley

Factor	Description	Internal Project	External Simple	Project Complex
Demolition	Destruction and removal of existing asset.	0%	5%	10%
Ancillary Support	Lumped cost of low value items not included as assets such as sump pumps, seal water pumps, small valves, service-air piping, hoses, etc.	20%	20%	20%
Construction and Estimating Contingency	Unforeseen or unanticipated project costs involved in the design details and installation of the new asset.	10%	10%	15%
	Subtotal	**30%**	**35%**	**45%**
General Conditions	All items contained within Division 01 of most project specifications including: mobilization and demobilization, contractor temporary facilities, contractor's field supervision, and bonds and insurance.	0%	10%	15%
	Subtotal	**30%**	**49%**	**67%**
Contractor Overhead and Profit Margin	This value includes general contractor home office overheads and profit.	0%	12%	12%
	TOTAL DIRECT COST FACTOR	**30%**	**67%**	**87%**
Sales Tax Rate	Sales tax of 9.75 percent applied to half of direct cost.	5%	5%	5%
Engineering, Legal, Administrative, and Project Contingencies	Engineering (design and services during construction), legal, and administrative costs reflect assistance with permitting and financing.	0%	0%	40%
	TOTAL INDIRECT COST FACTOR	5%	5%	45%
	TOTAL DIRECT AND INDIRECT MULTIPLIERS (COMPOUNDED)	1.37	1.75	2.71

5.2.3 5- and 10-Year Capital Improvement Program Recommendations

Projects recommended for the 5-year timeframe were packaged into likely undertakings and are shown in Table 5.3. Assets due for replacement in the 5- to 10-year timeframe were tabulated based on the estimated year due but were not packaged into specific projects. The annual totals for assets estimated to need replacement in the 5- to 10-year timeframe are shown in Table 5.4. Details on which assets are included in each fiscal year can be found in Appendix C.

Table 5.3 Recommended Projects for 5-Year CIP for Aboveground Assets
Asset Management Plan
City of Simi Valley

Fiscal Year	Recommended Project	Total Estimated Project Cost[1]
11/12	Preliminary Design Study for Electrical Project	$136,000
	Structural Rehabilitation of Filter Gallery	$173,000
	Structural Rehabilitation of Sludge Holding Tank	$166,000
	Rebuild of Ferric Containment Area and New Pump	$180,000
	Digester Rehabilitation (preliminary work)[2]	$500,000
	Fiscal Year 11/12 Total	**$1,155,000**
12/13	MCCs A, B1, B2, C1, C2, D, E, F, and G (initial year)	$1,625,000[3]
	Seismic Retrofit of Bar Screen Building	24,000
	Seismic Retrofit of Operations Building	$281,000
	Seismic Retrofit of 1971 Chlorination Building	$33,000
	Seismic Retrofit of 1985 Chlorination Building	$21,000
	Seismic Retrofit of Westside Electrical Building	$14,000
	Seismic Retrofit of Digester Control Building	$6,000
	Applied Water VFDs and Pumps	$387,000
	Chlorine Feed Pumps	$42,000
	Fiscal Year 12/13 Total	**$2,433,000**
13/14	MCCs A, B1, B2, C1, C2, D, E, F, and G (continued)	$1,625,000[3]
	WAS Pump Nos. 1 and 2	$102,000
	Fiscal Year 13/14 Total	**$1,727,000**
14/15	MCCs A, B1, B2, C1, C2, D, E, F, and G (continued)	$1,625,000[3]
	BNR Mixer Nos. 1A – 2C	$96,000
	Filtrate Return Pumps	$24,000
	Fiscal Year 14/15 Total	**$1,745,000**
15/16	MCCs A, B1, B2, C1, C2, D, E, F, and G (continued)	$1,625,000[3]
	Digester Rehabilitation (initial year)	$500,000[4]
	Headworks Improvement Project (initial year)	$1,000,000[5]
	BNR Mixer Nos. 3A – 4C	$96,000

Table 5.3	Recommended Projects for 5-Year CIP for Aboveground Assets Asset Management Plan City of Simi Valley	
Fiscal Year	**Recommended Project**	**Total Estimated Project Cost[1]**
	Arroyo Pump Station PLC Cabinet and Programming	$43,000
	Asset Reliability Assessment and Financial Plan Update	$125,000
	Fiscal Year 15/16 Total	**$3,389,000**
	FISCAL YEARS 11/12 TO 15/16 TOTAL	**$10,449,000**

Notes:

(1) Estimated replacement costs are presented in 2010 dollars at the 20-cities average ENR of 8952. These costs include direct and indirect cost factors to estimate the total project cost to replace an asset in-kind. Costs are prepared in accordance with AACE International Class 4 estimates, with an expected accuracy range of -30% to 50%.

(2) Preliminary digester rehabilitation efforts will include addressing leaks and conducting other structural rehabilitation likely to be recommended in the pre-design study previously funded and anticipated to occur within Fiscal Year 11/12.

(3) Electrical Project costs will be refined following the pre-design study scheduled for Fiscal Year 11/12. For planning purposes, a budgetary cost estimate of $6,500,000 was spread over 4 years.

(4) Digestion Project costs will be refined following the pre-design study previously funded and anticipated to occur within Fiscal Year 11/12. For planning purposes, a budgetary cost estimate of $2,000,000 was spread over 4 years.

(5) Planning level costs for 1/4-inch step-style bar screens and new washer compactors to replace aging equipment and improve screenings capture. Also includes costs for improved ventilation. Additional costs for channel reconfiguration may or may not be required, depending on hydraulics. As with all cost estimates shown, costs should be refined in pre-design study.

Table 5.4	Renewals Estimated for 5- to 10-Year CIP for Aboveground Assets Asset Management Plan City of Simi Valley	
Fiscal Year	**Assets Included in Rehabilitation and Replacement Costs**	**Total Estimated Project Cost[1]**
16/17	Headworks Improvements Project continued[2], BNR Mixer Nos. 3A - 4C, chlor/dechlor pumps, Digester Rehabilitation Project continued[3], Dewatered Cake Conveyor No. 1, hot water boilers, FEB pumps, flowmeters, grit pumps, generator switchboard and automatic transfer switch, primary sludge pumps, and secondary sludge collector and skimmer pumps, Arroyo Pump Station Sewer Lift Pump Nos. 1 and 2, Belt Filter Press No. 1, Booster Pump, Polymer Pump	$4,073,000

Table 5.4	Renewals Estimated for 5- to 10-Year CIP for Aboveground Assets Asset Management Plan City of Simi Valley	
Fiscal Year	**Assets Included in Rehabilitation and Replacement Costs**	**Total Estimated Project Cost(1)**
17/18	BNR recycle pumps, Belt Filter Press No. 2 and booster pump, Digester Rehabilitation Project continued(3), sludge feed pumps, backwash underdrain pumps, waste backwash water pumps, water pumps, primary sedimentation basin gates, Ferric Pump No. 1	$3,666,000
18/19	West Side BNR Blower Nos. 1 and 2, chlorine analyzers, TWAS pumps, polymer transfer pumps, heat exchanger pumps, sludge recirculation pumps, grit classifiers, primary skimmers, Secondary Sludge Collector No. 1, and RAS and WAS VFDs	$1,978,000
19/20	BNR blowers, backwash blowers, Belt Filter Press No. 3 and booster pump, sludge feed pump VFDs, and switchboard MSB	$2,643,000
20/21	DAFT collector drive, DAFT polymer mixing tank, MCC-J, Asset Reliability Assessment and Financial Plan Update	$1,241,000
	Fiscal Years 16/17 to 20/21 Total	**$13,601,000**

Notes:
(1) Estimated replacement costs are presented in 2010 dollars at the 20-cities average ENR of 8952. These costs include direct and indirect cost factors to estimate the total project cost to replace an asset in-kind. Costs are prepared in accordance with AACE International Class 4 estimates, with an expected accuracy range of -30% to 50%.
(2) Planning level costs for 1/4-inch step-style bar screens and new washer compactors to replace aging equipment and improve screenings capture. Also includes costs for improved ventilation. Additional costs for channel reconfiguration may or may not be required, depending on hydraulics. As with all cost estimates shown, costs should be refined in pre-design study.
(3) Digestion Project costs will be refined following the pre-design study previously funded and anticipated to occur within Fiscal Year 11/12. For planning purposes, a budgetary cost estimate of $2,000,000 was spread over 4 years.

5.3 BELOWGROUND ASSETS

5.3.1 Cost Basis and Assumptions

For belowground sewer collection system assets, a slightly different approach was taken than for aboveground assets. For sewer pipelines, it was assumed that all capital renewal projects would be for pipeline rehabilitation, not replacement. The main reason for this approach is that it is cost prohibitive for the City to replace pipes due to the large presence of asbestos cement pipe materials which would require hazardous materials handling, the high groundwater areas that would need extensive dewatering, and the depth of pipes which would require expensive trenching and shoring. However, replacement costs were also estimated in order to provide a measure of the total asset value of the belowground sewer assets, including all pipelines and manholes.

A method similar to the one used in the Sewer Collection System Asset Evaluation and Rehabilitation Plan was applied to calculate cost modifiers on base material costs. Cost modifiers were included for the following factors, which were determined using geographic information system (GIS) and data collected from previous CCTV inspections, where available:

- Bypass Pumping:
  Varies based on pipe diameter.
- Traffic Control:
  Based on street designation of major (M) or typical (T) derived from GIS analysis.
- Dewatering:
  Based on areas of high groundwater within the City and derived from GIS analysis.
- Various Risk Factors:
  Based on the same criteria included for calculating asset criticality and derived from GIS. Includes the following factors:
  - Environmental: Proximity to drainage and wetland areas in the City.
  - Railroad: Proximity to railroads.
  - Streets: Proximity to classification of major and minor streets.
  - School/Hospital: Proximity to schools and hospital locations.
  - Groundwater: Proximity to areas of high groundwater in the City.

Table 5.5 presents the unit cost factors and percentages used for these cost modifiers.

Table 5.5 Cost Modifiers and Unit Cost Factors
Asset Management Plan
City of Simi Valley

	CIPP Rehab		PVC Replace	Bypass		Traffic Control		Groundwater		Risk				
Pipe Size	Install Cost ($/in. dia./LF)	Base Install Unit Cost	Base Install Unit Cost	Major Street	Typical Street	Major Street	Typical Street	Yes	No	1 - Env	2 - RR	3 - Street	4 - School/ Hospital	5 - GW
3	$5	$50	$131	15%	10%	15%	5%	10%	0%	25%	37%	50%	65%	65%
4	$5	$50	$131	15%	10%	15%	5%	10%	0%	25%	37%	50%	65%	65%
6	$5	$50	$131	15%	10%	15%	5%	10%	0%	25%	37%	50%	65%	65%
8	$5	$50	$131	15%	10%	15%	5%	10%	0%	25%	37%	50%	65%	65%
9	$5	$60	$136	15%	10%	15%	5%	10%	0%	25%	37%	50%	65%	65%
10	$5	$60	$141	15%	10%	15%	5%	10%	0%	25%	37%	50%	65%	65%
12	$5	$65	$154	15%	10%	15%	5%	10%	0%	25%	37%	50%	65%	65%
14	$5	$112	$159	30%	20%	15%	5%	10%	0%	25%	37%	50%	65%	65%
15	$5	$120	$162	30%	20%	15%	5%	10%	0%	20%	30%	40%	50%	50%

Table 5.5 Cost Modifiers and Unit Cost Factors
Asset Management Plan
City of Simi Valley

	CIPP Rehab		PVC Replace	Bypass		Traffic Control		Groundwater		Risk				
Pipe Size	**Install Cost ($/in. dia./LF)**	**Base Install Unit Cost**	**Base Install Unit Cost**	**Major Street**	**Typical Street**	**Major Street**	**Typical Street**	**Yes**	**No**	**1 - Env**	**2 - RR**	**3 - Street**	**4 - School/ Hospital**	**5 - GW**
16	$7	$128	$166	30%	20%	15%	5%	10%	0%	20%	30%	40%	50%	50%
18	$7	$144	$171	60%	40%	15%	5%	10%	0%	18%	25%	30%	35%	35%
20	$7	$160	$186	60%	40%	15%	5%	10%	0%	18%	25%	30%	35%	35%
21	$7	$168	$194	60%	40%	15%	5%	10%	0%	18%	25%	30%	35%	35%
24	$7	$192	$207	60%	40%	15%	5%	10%	0%	18%	25%	30%	35%	35%
27	$7	$216	$229	70%	40%	15%	5%	10%	0%	15%	18%	20%	25%	25%
30	$7	$240	$253	70%	40%	15%	5%	10%	0%	15%	18%	20%	25%	25%
33	$8	$264	$296	80%	50%	15%	5%	10%	0%	15%	18%	20%	25%	25%
36	$10	$360	$320	80%	50%	15%	5%	10%	0%	13%	15%	18%	20%	20%
39	$10	$390	$339	80%	50%	15%	5%	10%	0%	13%	15%	18%	20%	20%
42	$10	$420	$361	80%	50%	15%	5%	10%	0%	13%	15%	18%	20%	20%
48	$10	$480	$405	80%	50%	15%	5%	10%	0%	13%	15%	18%	20%	20%

As with aboveground assets, the rehabilitation and replacement costs/values presented within this Summary Report for belowground assets are in-kind estimates of the total project cost to purchase and install or rehabilitate assets in today's dollars. Costs are not escalated in future years. Unit costs for the belowground assets were developed from the Carollo 3B Pipeline Model and the RS Means Construction Cost Index. These costs were adjusted and confirmed using recent construction bid data provided by the City. Construction costs were estimated by developing pipe unit costs, then applying indirect multipliers to estimate the total project costs. The following indirect/contingency multipliers shown in Table 5.6 were used to calculate the total project cost based on the estimated construction cost for both rehabilitation and replacement of the sewer collection system.

Table 5.6 Direct Cost Factors for Belowground Assets
Asset Management Plan
City of Simi Valley

Factor	Description	All Projects
General Conditions	Includes all items contained within Division 00 and 01 of most project specifications including: mobilization and demobilization, contractor temporary facilities, contractor's field supervision, and bonds and insurance.	15%
	Subtotal	**15%**

Table 5.6 Direct Cost Factors for Belowground Assets Asset Management Plan City of Simi Valley		
Factor	**Description**	**All Projects**
Construction and Estimating Contingency	Items that are known but not quantified during the cost estimate, as well as unforeseen or unanticipated project costs involved in the installation of the new asset.	20%
	Subtotal	**38%**
Contractor Overhead and Profit Margin	This value includes general contractor home office overhead and profit.	12%
	TOTAL DIRECT COST FACTOR:	**55%**
Engineering, Legal, Administrative, Contingencies	Engineering (design and services during construction), legal, and administrative costs reflect assistance with permitting and financing.	20%
	TOTAL INDIRECT COST FACTOR	**20%**
	TOTAL DIRECT AND INDIRECT MULTIPLIERS (COMPOUNDED)	**85%**

The following are the assumptions for the rehabilitation cost estimates:

- All sewer pipelines will be rehabilitated with cured-in-place-pipe (CIPP) such as Insituform CIPP.

The following are the assumptions for the replacement cost estimates:

- All sewer pipe materials will be replaced with PVC.
- Existing sewer pipelines with diameter less than 8 inches will be replaced with 8-inch PVC pipeline.
- Pipe depth is assumed to be 12 feet.
- Vertical shoring is required.
- Pavement replaced is assumed to be 3-inch AC on 6-inch ABC.
- Trench width is pipeline outer diameter plus 8 inches each side for 30-inch diameter pipe and less, and pipeline outer diameter plus 12 inches each side for greater than 30-inch diameter pipe.
- Pipe base is 4 inches for 10-inch outer diameter and less, 6 inches for 12-inch outer diameter and greater.
- No corrosion protection is included.
- Sales tax at 8.75 percent is included in material cost for pipe and earthwork.

The unit costs for wastewater collection system replacements also include associated trenching and bedding, pavement replacement, manhole placements, and other related structures such as connections for sewer laterals.

The pipe unit construction costs in Table 5.7 were used to calculate the asset rehabilitation and replacement cost estimates for the wastewater collection system. These unit costs were confirmed with previous cost estimates for sewer pipelines and recent bid estimates that the City has received on pipeline rehabilitation projects for 2010.

Table 5.7 Unit Construction Costs for CIPP and PVC Pipe
Asset Management Plan
City of Simi Valley

Diameter (inches)	CIPP Rehabilitation Pipe Unit Cost ($/linear foot)	PVC Replacement Pipe Unit Cost ($/linear foot)
8	$50	$131
9	$60	$136
10	$60	$141
12	$65	$154
14	$112	$159
15	$120	$162
16	$128	$166
18	$144	$171
20	$160	$186
21	$168	$194
24	$192	$207
27	$216	$229
30	$240	$253
33	$264	$296
36	$360	$320
39	$390	$339
42	$420	$361
48	$480	$405

Assumptions:
(1) Excavation and backfill assumed to be 12 feet deep for pipe replacement.
(2) Unit costs include sales tax (8.75%).
(3) Costs do not include pavement replacement, contractor overhead and profit, contractor contingency, general conditions, and engineering/legal/administrative direct and indirect costs.
(4) Unit costs based on ENR CCI = 8952, December 2010.

5.3.2 Replacement Cost Summary

Table 5.8 presents the overall cost valuation for belowground assets. The total shown is the sum of the individual asset replacement costs for all belowground assets in the AMP asset inventory and developed from the City's GIS. This total is not the same as the recommended CIP expenditures because replacement costs, not rehabilitation, have been used to represent a true value of the sewer collection system.

Table 5.8 Sewer Collection System Replacement Costs by Diameter Asset Management Plan City of Simi Valley	
Diameter (inches)	**Total Replacement Cost**
8 and less	$432,100,000
9	$56,000
10	$24,746,000
12	$22,697,000
14	$4,188,000
15	$6,829,000
16	$1,903,000
18	$16,501,000
20	$12,413,000
21	$7,089,000
24	$13,046,000
27	$6,076,000
30	$2,336,000
33	$10,979,000
36	$17,349,000
39	$5,829,000
42	$171,000
48	$5,174,000
Manholes(3)	$64,923,000
Total	**$654,405,000**

Assumptions:
(1) Costs include pavement replacement, general conditions (15%), construction contingency (20%), contractor overhead and profit (12%), and engineering/legal/administrative costs (20%).
(2) Unit costs based on ENR CCI = 8952.
(3) Number of manholes was 6,365. Estimated replacement cost was $10,200 for each manhole including direct and indirect costs.

5.3.3 Recommendations for 5- and 10-Year Capital Improvement Programs

Belowground sewer collection system projects recommended for the 5-year timeframe confirmed the sanitation pipeline projects that were included in the City's current CIP. An additional project was placed in each year to conduct CCTV inspection of the sewer pipelines that were not inspected under the Sewer Collection System Asset Evaluation and Rehabilitation Plan and are planned for rehabilitation. It is recommended that the City conduct CCTV inspections and condition assessment of its entire sewer collection system every 5 years. This ongoing CCTV program will provide confirmation of the need for pipeline rehabilitation or replacement, and verify the cost estimates for the upcoming CIP.

A summary of the 5-year CIP for belowground assets is shown in Table 5.9. Assets due for replacement in the 5- to 10-year timeframe were tabulated based on the estimated year due but were not packaged into specific projects. The annual totals for assets estimated to need rehabilitation in the 5- to 10-year timeframe are shown in Table 5.10. Details on which assets are included in each fiscal year can be found in Appendix D.

Table 5.9 Recommended Projects for 5- Year CIP for Belowground Assets
Asset Management Plan
City of Simi Valley

Fiscal Year	Recommended Project	Total Estimated Project Cost[1]
11/12	Project No. 8:	$720,000
	• 14-inch ACP pipe on Los Angeles Ave.	
	• 12-inch ACP pipe on Beaumont St. and Williams Way	
	• 10-inch ACP pipe on Beaumont St.	
	Project No. 9:	$1,327,000
	• 33-inch ACP pipe on W. Los Angeles Ave.	
	Project No. 10:	$1,606,000
	• 20-inch ACP pipe on Shopping Ln.	
	• 15-inch ACP pipe on Sinaloa Rd.	
	Sewer Pipe Condition Assessment:	$100,000
	• CCTV inspection and assessment of ~100,000 LF of pipe	
	Fiscal Year 11/12 Total	**$3,753,000**
12/13	Project No. 11:	$675,000
	• 14- and 12-inch ACP pipe on Sycamore Dr.	
	Project No. 12:	$1,069,000
	• 12-inch ACP pipe on Tapo Canyon Rd.	
	• 10-inch VCP pipe on Sorrel St.	
	Project No. 13:	$3,055,000
	• 36-, 30-, 24-, and 18-inch ACP pipe on E. Los Angeles Ave.	
	• 18-inch ACP pipe on Texas Ave.	
	Sewer Pipe Condition Assessment:	$100,000
	• CCTV inspection and assessment of ~100,000 LF of pipe	
	Fiscal Year 12/13 Total	**$4,898,000**
13/14	Project No. 14:	$6,266,000
	• 36- and 33-inch ACP pipe on E. Los Angeles Ave.	
	• 33-inch ACP pipe on Patricia Ave.	
	• 12-inch ACP pipe on Erringer Rd.	
	Sewer Pipe Condition Assessment:	$100,000
	• CCTV inspection and assessment of ~100,000 LF of pipe	
	Fiscal Year 13/14 Total	**$6,366,000**

Table 5.9	Recommended Projects for 5- Year CIP for Belowground Assets Asset Management Plan City of Simi Valley	
Fiscal Year	**Recommended Project**	**Total Estimated Project Cost[(1)]**
14/15	Project No. 15:	$2,252,000
	• 48- and 20-inch ACP pipe along the Arroyo Simi	
	• 36-inch ACP pipe on W. Easy St.	
	Project No. 16:	$1,835,000
	• 20-inch ACP pipe on Royal Ave.	
	Project No. 17:	$982,000
	• 36- and 33-inch ACP pipe on E. Easy St.	
	• 24-inch ACP pipe on 5th St. and Ventura Ave.	
	Sewer Pipe Condition Assessment:	$100,000
	• CCTV inspection and assessment of ~100,000 LF of pipe	
	Fiscal Year 14/15 Total	**$5,169,000**
15/16	Project No. FY15/16 A:	$2,996,000
	• 24-inch ACP pipe on Royal Ave.	
	Project No. FY15/16 B:	$963,000
	• 24-inch ACP pipe on First St.	
	• 20-inch ACP pipe on Buyers St.	
	• 18-, 14-, and 12-inch ACP on E. Los Angeles Ave.	
	• 18-inch ACP pipe on Marlin Dr.	
	• 12-inch ACP pipe on Tapo St.	
	• 12-inch ACP pipe on Williams Way and Ysrella Ave.	
	• 10-inch ACP pipe on 4th St. and Bryson Ave.	
	Project No. FY15/16 C:	$1,086,000
	• 20- and 10-inch ACP pipe on Erringer Rd.	
	• 14-inch ACP pipe on Heywood St.	
	• 12-inch ACP pipe on Bolivar Ct.	
	• 12-inch DIP and 10-inch ACP pipe on Cochran St.	
	• 10-inch ACP pipe on Elizondo Ave. and Rosalie St.	
	Sewer Pipe Condition Assessment:	$100,000
	• CCTV inspection and assessment of ~100,000 LF of pipe	
	Fiscal Year 15/16 Total	**$5,145,000**
	FISCAL YEARS 11/12 TO 15/16 TOTAL	**$25,331,000**

Notes

(1) Estimated replacement costs are presented in 2010 dollars at the 20-cities average ENR of 8952. These costs include direct and indirect cost factors to estimate the total project cost. Costs are prepared in accordance with AACE International Class 4 estimates, with an expected accuracy range of -30% to +50%.

Table 5.10 Renewals Estimated for 5- to 10-Year CIP for Belowground Assets
Asset Management Plan
City of Simi Valley

Fiscal Year	Assets Included in Rehabilitation and Replacement Costs	Total Estimated Project Cost[1]
16/17	• 24-inch ACP pipe on 5th St., First St., Royal Ave. and Ventura Ave. • 27-inch ACP pipe on Strathearn Pl. • 14-inch ACP pipe on Heywood St. • 10-inch ACP pipe on Beaumont St. • Sewer Pipe Condition Assessment	$5,369,000
17/18	• 20-inch ACP pipe on Royal Ave. and Erringer Rd. • 16-inch ACP pipe on Erringer Rd. and Heywood St. • 15-inch ACP pipe on E Los Angeles Ave. • 14-inch ACP pipe on Heywood St. • 12-inch ACP pipe on E. Easy St., Katherine Rd., and Ysrella Ave. • 10-inch ACP pipe on Birchfield St., Elizondo Ave., N. Justin Ave., Stow St., and Tracy Ave. • Sewer Pipe Condition Assessment	$4,175,000
18/19	• 36-inch ACP pipe on E. Easy St. • 33-inch ACP pipe on Patricia Ave. • 24-inch ACP pipe on E. Los Angeles Ave. • 18-inch ACP pipe on Alamo St. and E. Los Angeles Ave. • 14-inch ACP pipe on Heywood St. and Yosemite Ave. • 12 inch ACP pipe on Sycamore Dr. and Williams Way • 10-inch ACP pipe on Christine Ave., Elizondo Ave., Hilldale Ave., N. Justin Ave., N. Vera Ct., and Stow St. • Sewer Pipe Condition Assessment	$6,301,000
19/20	• 36-inch ACP pipe on E. Easy St. and E. Los Angeles Ave. • 33-inch ACP pipe on E. Los Angeles Ave. • 18-inch ACP pipe on Alamo St. and Cochran St. • 16-inch CIP pipe on N. Wood Ranch Pkwy • 15-inch ACP pipe on Alamo St. • 12 inch ACP pipe on Erringer Rd., and Tapo Canyon Rd. • 10-inch ACP pipe on E. Los Angeles Ave., Erringer Rd., First St., Hietter Ave., Kadota St., Marvel Ave., Stow St., and Tracy Ave. • 8-inch CIP pipe on Alscot Ave and Cory St. • Sewer Pipe Condition Assessment	$6,649,000
20/21	• 39-inch ACP pipe on E. Easy St. and E. Los Angeles Ave. • 36-inch ACP pipe on E. Easy St. • 27-inch ACP pipe on E. Los Angeles Ave. • 21-inch ACP pipe on Angela St.	$6,723,000

Table 5.10	Renewals Estimated for 5- to 10-Year CIP for Belowground Assets Asset Management Plan City of Simi Valley	
Fiscal Year	**Assets Included in Rehabilitation and Replacement Costs**	**Total Estimated Project Cost(1)**
	• 20-inch ACP pipe on Royal Ave. • Sewer Pipe Condition Assessment	
	Fiscal Years 16/17 to 20/21 Total	**$29,217,000**

Notes
(1) Estimated replacement costs are presented in 2010 dollars at the 20-cities average ENR of 8952. These costs include direct and indirect cost factors to estimate the total project cost. Costs are prepared in accordance with AACE International Class 4 estimates, with an expected accuracy range of -30% to +50%.

5.3.4 Long-Term Belowground Asset Renewal

In addition to developing a 5- and 10-year R&R CIP renewal program, the belowground assets were also analyzed for the long-term renewals through at least one cycle of rehabilitation. The purpose of this analysis was to understand the long-term needs for belowground assets to use for strategic planning purposes. These strategic planning estimates are not recommended to be used for setting rates and establishing replacement reserve funds because there are too many variables to ensure a completely accurate cost estimate and more information should be gathered to determine whether the estimated useful lives of various classes of belowground assets reflect the actual conditions.
Figure 5.1 shows the projected pipe rehabilitation length by year and material type, and Figure 5.2 illustrates the estimate sewer pipe rehabilitation costs by year and material type.

Figure 5.1 Projected Sewer Pipe Rehabilitation Length

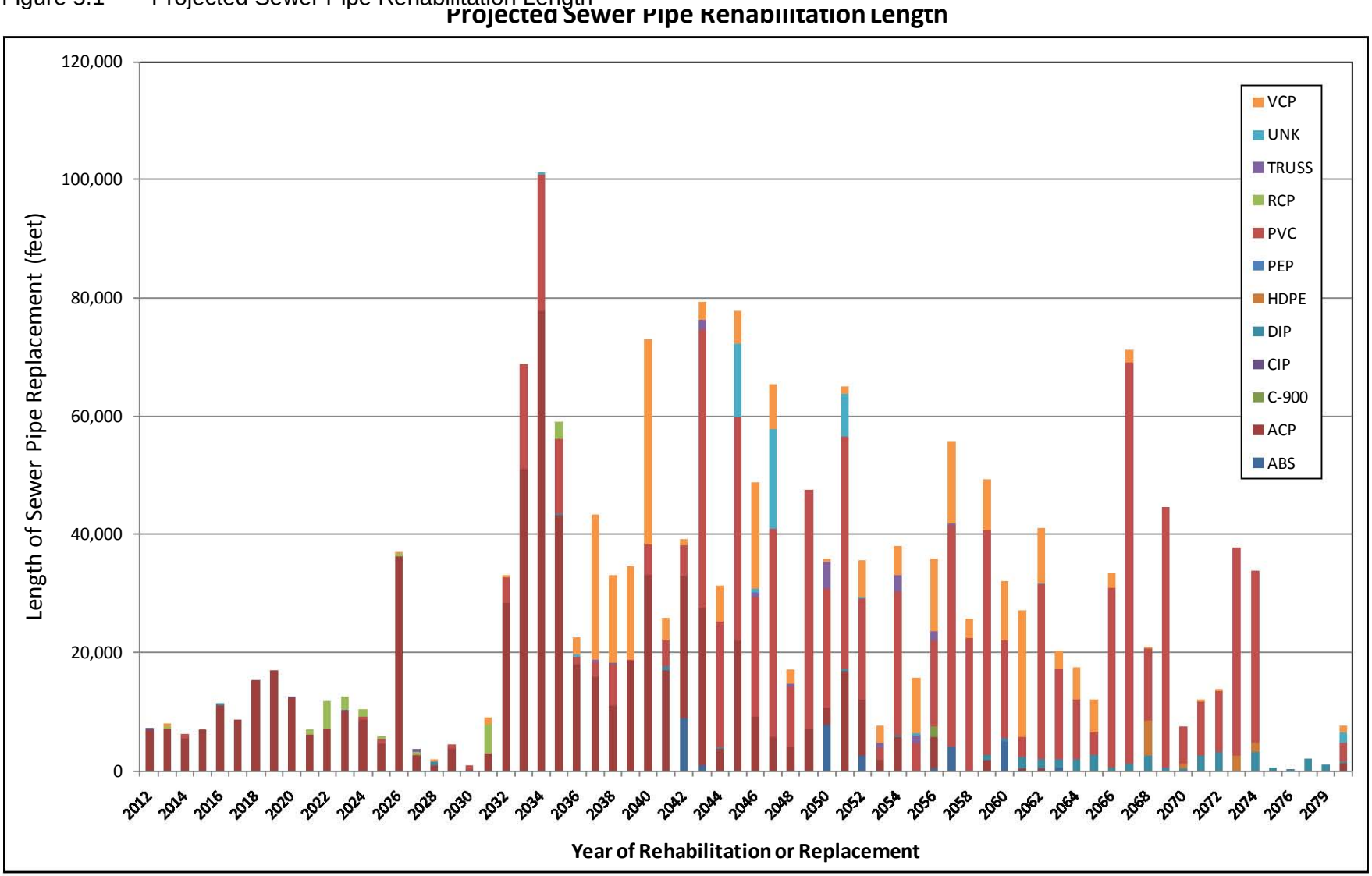
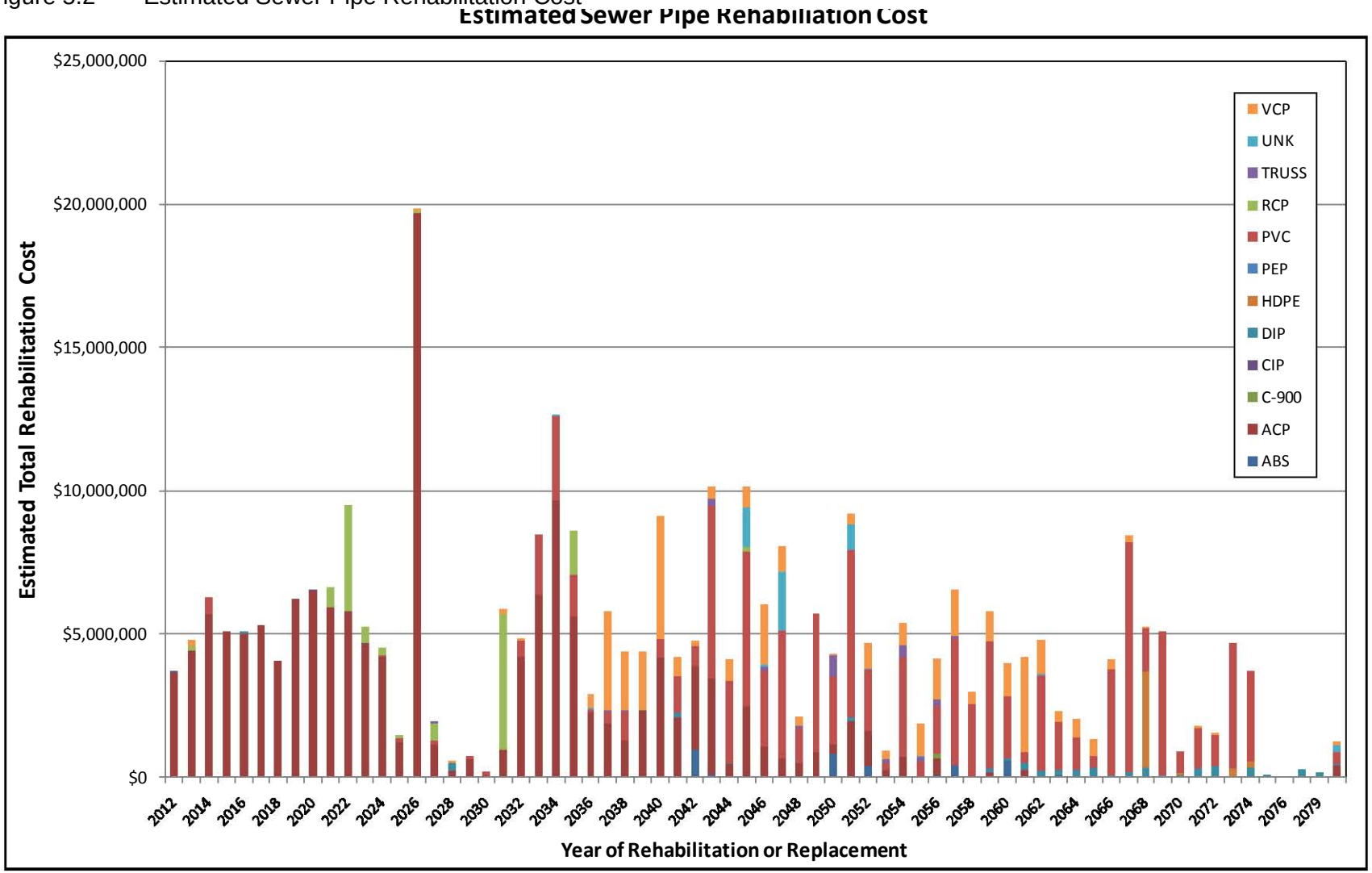


Figure 5.2 Estimated Sewer Pipe Rehabilitation Cost



5.4 COMBINED ABOVEGROUND AND BELOWGROUND ASSETS

5.4.1 10-Year Rehabilitation and Replacement Capital Improvement Program Summary

Table 5.11 shows the combined annual expenditures for the recommended 10-year R&R CIP for aboveground and belowground water assets.

Table 5.11 Summary of Annual Expenditures for Recommended 10-Year R&R CIP for Aboveground and Belowground Water Assets
Asset Management Plan
City of Simi Valley

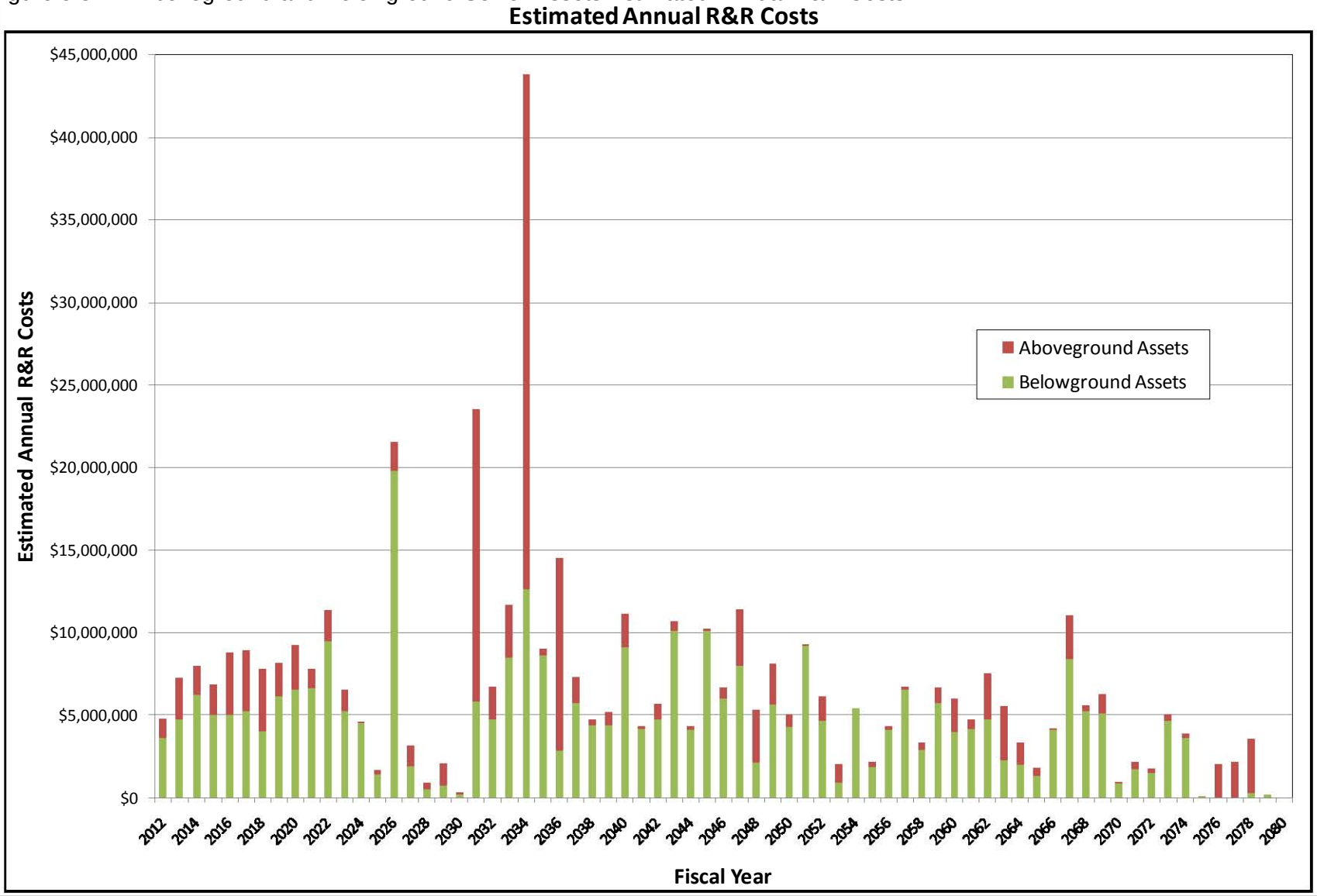
Year	Aboveground(1)	Belowground(1)	Combined(1)
11/12	$1,155,000	$3,753,000	$7,521,000
12/13	$2,433,000	$4,898,000	$7,331,000
13/14	$1,727,000	$6,366,000	$8,093,000
14/15	$1,745,000	$5,169,000	$6,914,000
15/16	$3,389,000	$5,145,000	$8,534,000
16/17	$4,073,000	$5,369,000	$9,442,000
17/18	$3,666,000	$4,175,000	$7,841,000
18/19	$1,978,000	$6,301,000	$8,279,000
19/20	$2,643,000	$6,649,000	$9,292,000
20/21	$1,241,000	$6,723,000	$7,964,000
Total	**$24,050,000**	**$54,548,000**	**$78,598,000**

Note:
(1) Estimated replacement costs are presented in 2010 dollars at the 20-cities average ENR or 8952. These costs include direct and indirect cost factors to estimate the total project cost to replace an asset in-kind. Costs are prepared in accordance with AACE International Class 4 estimates, with an expected accuracy range of -30% to 50%.

5.4.2 Long-Term Capital Improvement Program Forecast

Figure 5.3 show the rehabilitation and replacement needs of the aboveground and belowground sewer assets through the year 2080, also in 2010 dollars. This extended timeframe can be used to evaluate the future spikes in R&R needs as the City's longest lived assets reach the end of their useful lives. One area of concern is the large increase in estimated R&R needs for the years of 2026, 2031, and 2034. These are in large part due to major R&R needs for structures at the wastewater treatment plant such as primary sedimentation basins, secondary clarifiers, and the chlorine building and chlorine contact basins. As these years enter into the 10-year planning horizon, they should be evaluated in more detail to confirm the timing, cost, and potential impact to sanitation rates.

Figure 5.3 Aboveground and Belowground Sewer Assets Estimated Annual R&R Costs



FINANCIAL PLAN

6.1 INTRODUCTION

The preceding chapters have identified the needs for aboveground and belowground asset renewals and the associated costs of the recommended rehabilitation and replacement (R&R) program. The purpose of this chapter is to develop a financing plan to provide necessary funds to rehabilitate and replace assets as needed. This chapter also identifies the nexus between the cost and the service provided as required by Proposition 218.

It is the intent of this chapter to develop a financing plan for the recovery of cost associated with the recommended R&R program. This chapter is not intended to serve as a comprehensive rate study.

6.1.1 Proposition 218 Requirements

In order to implement a rate increase for property related services, Proposition 218 (Cal. Const., Article XIII D, Sec. 6) requires the City of Simi Valley (City) to:

- Inform the property owners that an increase in rates/charges is being considered.
- Clearly demonstrate the basis on which these rates/charges are calculated (the basis of costs for the R&R needs was provided in Chapter 5).
- Hold a public meeting at least 45 days after notice where the City hears all protests to the proposed rate increase.

Sewer rates are subject to “majority protest” where the rate increase cannot be implemented if a majority of the property owners impacted by the increase submit written protest objecting to the increase.

Additionally, Proposition 218 states the following regarding the recovery of costs associated with the service provided:

1. Revenues derived from the fee or charge shall not exceed the funds required to provide the property related service.
2. Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.
3. The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the parcel.
4. No fee or charge may be imposed for a service unless that service is actually used by, or immediately available to, the owner of the property in question.
5. No fee or charge may be imposed for general governmental services.

This chapter will demonstrate the funds required to meet the R&R needs and continue to provide adequate sewer service, that the recovered cost will not exceed the cost of service, and that the service is immediately available to impacted property owners.

6.2 FINANCIAL FORECAST ASSUMPTIONS

The City's financial forecast for the R&R capital improvement plan (CIP) was developed using several assumptions in the following categories:

- Forecast Horizon.
- Inflation and Interest Rates.
- Sources of Funds.
- Uses of Funds.
- Customer Growth and Revenue Projection.

Each of these assumption categories are discussed in further detail in subsequent sections.

6.2.1 Forecast Horizon

As discussed in Chapters 3 through 5, the R&R needs and annual cost estimates for aboveground and belowground assets were identified over one complete replacement cycle. Although the annual needs were identified for a duration exceeding 75 years, the financial forecast was only developed for a 10-year horizon, which was determined to provide the best balance of long-term planning and confidence level for cost estimating purposes.

A 10-year horizon was determined to be the appropriate forecast horizon. A forecast period lower than or exceeding this time period is deemed impractical for the following reasons:

- A shorter horizon may require repeated rate study and rate adjustments.
- The CIP needs within the 10-year period are clearly identified and unlikely to significantly vary from that presented.
- Technological advances may require update of the CIP in the longer term to replace currently planned improvements with better, lower cost options.
- Current customers are less likely to bear the full burden of R&R that may also benefit future users.

6.2.2 Inflation and Interest Rates

Cost inflation is expected to occur over the forecast horizon. However, due to the current economic and construction climate and uncertainty associated with future inflation expectations, all capital cost calculations were developed in present value dollars. O&M cost calculations assume a 2.5-percent inflationary increase per year over the next 5 years.

Due to the current economic climate, the interest rate on the City's reserves is at an all time low. Due to uncertainty associated with future interest rates, no interest was assumed in the financial forecast for the City's reserve fund balance.

6.2.3 Sources of Funds

Typically utilized sources of funds for sanitation projects include:

- Rates and Charges.
- Reserves.
- Connection Fees/Development Charges.
- General Fund.
- Grants and Loans.

The City's Sanitation Enterprise Fund (SEF) is the primary source of funds for the financing of the R&R program. The City's Budget and Fiscal Policy states that the SEF must be self-supporting such that the fees for operating services will be maintained at a level adequate to cover all operating expenses. In addition, there are four specific policies regarding rates and charges:

1. To establish an equitable basis for costing services to the public.
2. To accommodate special requests for services, while ensuring that the public-at-large does not incur the cost.
3. To provide for reasonable cost recovery for providing these services, including the direct cost of providing each service and the indirect costs as identified in the City's Cost Allocation Plan.
4. To ensure that fees do not exceed the cost of providing services.

6.2.3.1 <u>Rate and Charges</u>

The City's current R&R financing strategy is based on a pay-as-you go financing method. Pay-as-you-go financing involves periodic collection of capital charges or assessments from customers within the City's jurisdiction for funding current and future capital improvements. These revenues are accumulated in a capital reserve fund and are used for capital projects in future years. Pay-as-you-go financing can be used to finance 100 percent or only a portion of a given project.

One of the primary advantages of pay-as-you-go financing is that it avoids the transaction costs (e.g., legal fees, underwriters' discounts, etc.) associated with debt financing alternatives, such as revenue bonds. Common disadvantages associated with this include that it is difficult to raise the required capital within the allowable time without charging existing users elevated rates.

This analysis has been developed with the assumption that the City will continue to utilize a pay-as-you go financing method. In the event that the rate increase associated with a

pay-as-you-go method is determined unviable, alternate funding mechanisms will need to be evaluated.

6.2.3.2 Reserve Funds

The City utilizes R&R reserves to house the funds dedicated for R&R projects. The three primary reserve funds available to the City's sanitation funds include:

1. Vehicle Replacement Reserve.
2. Sanitation Replacement Reserve.
3. Sewerline Replacement Reserve.

In addition to the above reserves, the City maintains a sanitation system expansion/upgrade reserve. This reserve is primarily utilized for capacity upgrade and expansion and thus is not relied upon for R&R needs. Table 6.1 presents a summary of the projected ending fund balance for Fiscal Year End (FYE) 2011 for the above three funds.

Table 6.1 Projected Replacement Reserve Ending Fund Balance
Asset Reliability Assessment and Financial Plan
City of Simi Valley

Fund	Projected Ending Fund Balance in FY 2010-2011
Beginning Working Capital:	$9,206,059
Vehicle Replacement Reserve	$1,118,690
Sanitation Replacement Reserve	$3,342,903
Sewerline Replacement Reserve	$(5,445,326)
Ending Working Capital:	$8,222,326

Source: *Preliminary Base Budget, Fiscal Year 2010-2011, City of Simi Valley.*

Only the sanitation replacement and sewerline replacement reserves are used in the R&R CIP financial projections. As currently projected, the net balance in the sanitation and sewerline replacement reserve is projected to be less than zero. However, a starting reserve balance of zero was assumed for the financial forecast. The City may determine that a transfer to the replacement funds is desired in order to provide a positive starting point for projection of necessary rate adjustments.

6.2.3.3 Fund Transfers

Fund balances not earmarked by law for a specific purpose are available for transfer into the sanitation and sewerline replacement fund. Typically, the City transfers $1,975,000 from other funds to their replacement reserve funds. These transfers are assumed to continue annually over the duration of the planning horizon.

6.2.3.4 Grants and Loans

Grants and loans represent federal, state, and other contributions that can be used to offset the cost associated with the R&R CIP. No such grants, loans, or developer contributions are anticipated in the planning horizon.

6.2.3.5 Connection Fees/Developer Charges

Connection fees and developer charges are collected to recover the cost incurred to provide future users treatment and collection system capacity. As the R&R projects are not expected to increase system capacity, connection fees and developer charges are not expected to offset the cost of projects. No use of connection fees or developer charges, or the sewer expansion and upgrade reserve is relied upon as a source of funds in this cash flow projection.

6.2.4 Uses of Funds

The City's uses of funds for the sanitation and sewerline replacement reserves include the R&R CIP projects only. As this analysis is a source and use analysis for the sanitation and sewerline replacement reserve only, no other sanitation fund uses of funds is considered. For example, uses do not include vehicle replacements, operations and maintenance needs, or any other sanitation fund expenditures.

6.2.4.1 R&R CIP Expenditures

R&R CIP schedules and costs were developed for both aboveground and belowground assets as described in Chapters 3, 4, and 5. Using the R&R schedules and costs, 5-year and 10-year CIPs were developed for financial planning purposes.

6.2.4.1.1 *5-Year R&R CIP*

The 5-year CIP addresses the treatment and collection needs in the immediate term. All tactical aboveground projects are included in the 5-year CIP. Projects within the 5-year CIP include wastewater treatment plant electrical/instrumentation replacement, digester rehabilitation, and approximately $25 million in sewer collection system R&R. This CIP is intended to supersede the City's current 5-year CIP for sanitation projects for Fiscal Years (FYs) 2010-11 to 2014-15, and is inclusive of all planned sewer collection system and wastewater treatment plant projects for FYs 2011-12 to 2015-16.

Table 6.2 summarizes the annual 5-year CIP expenditures.

Table 6.2 5-Year R&R CIP Summary
Asset Reliability Assessment and Financial Plan
City of Simi Valley

	FYE 2012	FYE 2013	FYE 2014	FYE 2015	FYE 2016	Total
Aboveground	$1,155,000	$2,433,000	$1,727,000	$1,745,000	$3,389,000	$10,449,000
Belowground	$3,753,000	$4,898,000	$6,366,000	$5,169,000	$5,145,000	$25,331,000
Total	**$4,908,000**	**$7,331,000**	**$8,093,000**	**$6,914,000**	**$8,534,000**	**$35,780,000**

6.2.4.1.2 *10 Year R&R CIP*

The 10-year CIP addresses needs on the longer horizon. All aboveground projects in the CIP for the 5- to 10-year range are strategic projects. Example wastewater treatment plant projects in the 10-year CIP include DAFT repair, secondary clarification repair, and filtration equipment replacement. The 10-year CIP includes additional sewer collection system rehabilitation projects totaling $29 million between FYs 2016-17 and 2020-21.

Table 6.3, on the following page, summarizes the annual 10-year CIP expenditures. The annual expenditures required for the 10-year CIP are presented in Figure 6.1.

6.2.4.2 Reserve Fund Maintenance

The City's reserve fund does not have a minimum fund balance policy for its sanitation and sewerline replacement funds. As such, rate impacts to maintain a minimum fund balance were not considered in the development of the rate model.

Similarly, the City does not maintain a policy on maximum allowable reserves. The objective of this analysis was to determine the rate impacts while maintaining minimal fund balances in the forecasting horizon. Therefore, a maximum ending fund balance was also not defined.

6.2.5 Customer Growth and Revenue Projection

The number of City equivalent residential dwelling units (EDUs) was utilized in developing the revenue projections for the reserve funds. The existing number of EDUs were developed by using the number of accounts, the EDU multiple, and City-provided data. Table 6.4 summarizes the existing number of EDUs.

Table 6.4 Number of Sanitation EDUs in FYE 2011
Asset Reliability Assessment and Financial Plan
City of Simi Valley

	Number	EDU Multiple	Total EDUs in FYE 2011
Single-Family Residential	32,212	1.00	32,212
Multi-family Residential	3,241	0.75	2,431
Industrial/Commercial(1)	1,018	-	6,185
		Total EDUs	**40,828**

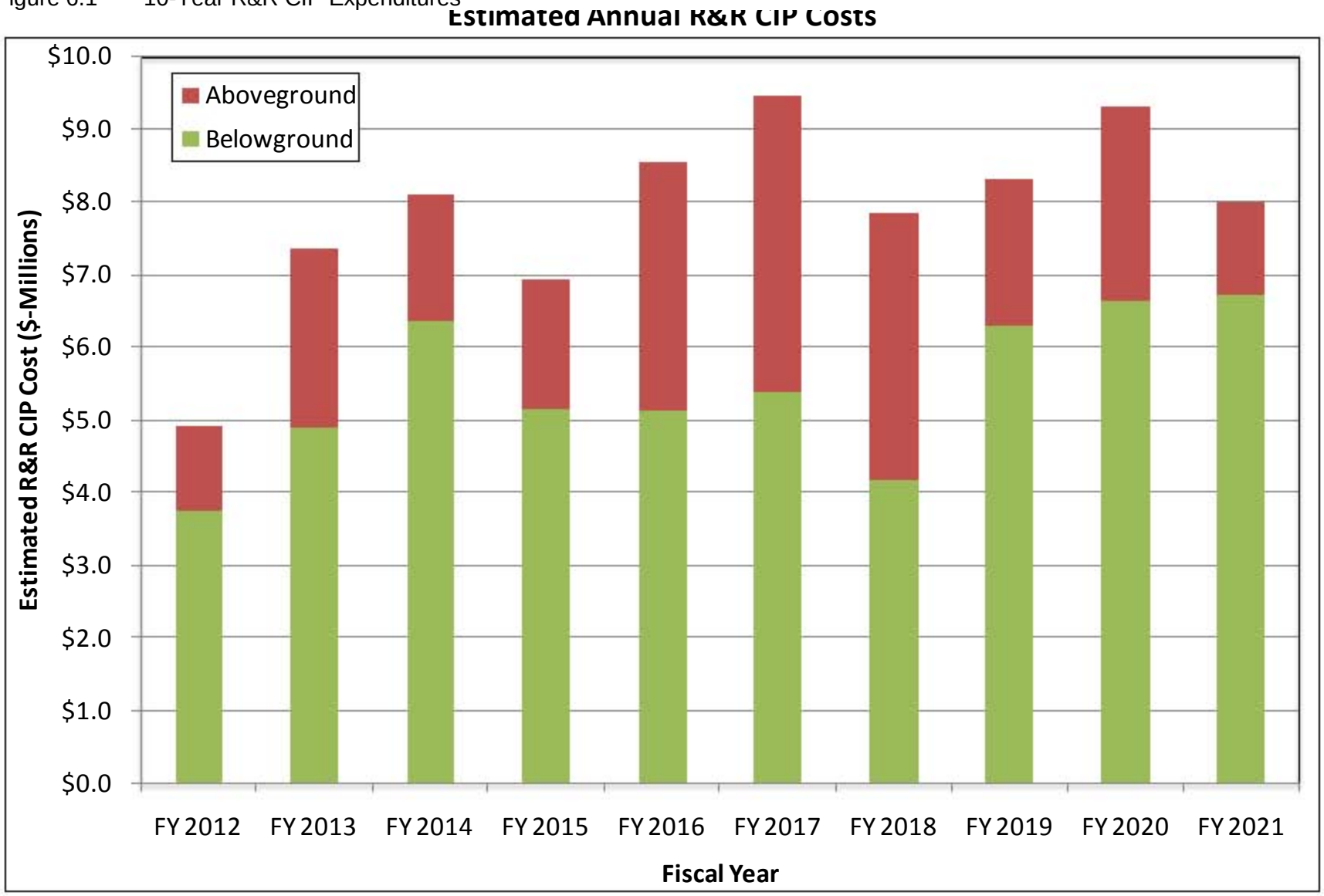
Notes:
1. The number of industrial/commercial accounts was developed by City staff using the revenue generated from industrial/commercial accounts and the single family residential billing rate.

Source: *City Public Works Department*

Table 6.3 10-Year R&R CIP Summary
Asset Reliability Assessment and Financial Plan
City of Simi Valley

	FYE 2012	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021	Total
Aboveground	$1,155,000	$2,433,000	$1,727,000	$1,745,000	$3,389,000	$4,073,000	$3,666,000	$1,978,000	$2,643,000	$1,241,000	$24,050,000
Belowground	$3,753,000	$4,898,000	$6,366,000	$5,169,000	$5,145,000	$5,369,000	$4,175,000	$6,301,000	$6,649,000	$6,723,000	$54,548,000
Total	**$4,908,000**	**$7,331,000**	**$8,093,000**	**$6,914,000**	**$8,534,000**	**$9,442,000**	**$7,841,000**	**$8,279,000**	**$9,292,000**	**$7,964,000**	**$78,598,000**

Figure 6.1 10-Year R&R CIP Expenditures



The growth in the City's sanitation account customer growth was assumed to occur at the same rate as the City's projected population growth. The projected growth rates used in the financial forecast are summarized in Table 6.5.

Table 6.5	**EDU Growth Rate Asset Reliability Assessment and Financial Plan City of Simi Valley**					
	2010 - 2015	**2015- 2020**	**2020 - 2025**	**2025 - 2030**	**2030 - 2035**	**2035+**
Account Growth	0.34%	0.32%	0.21%	0.17%	0.15%	0.05%
Source: *City Public Works Department*						

The City's monthly sanitation charge for a single-family residential unit in FY 2012 is $26.08. All revenue projections were developed with the assumption that the current revenue developed per EDU per month is $26.08 or $313.00 per EDU per year.

6.3 R&R CASH FLOW FORECAST

Using the assumptions discussed above, a financial forecast was developed for the sources and uses for the combined sanitation and sewerline replacement reserve. Several forecast scenarios were evaluated over the 10-year period from FYE 2012 to FYE 2021 to identify recommended rate adjustments.

6.3.1 Scenario 1 - No Rate Adjustment

A scenario where no rate adjustment is implemented in the forecast horizon was evaluated to determine the worst-case scenario. Table 6.6 summarizes the cash flow forecast without any rate increase. As seen from Table 6.6, with no rate adjustment, the R&R reserve fund balance is expected to be at a deficit of more than $65 million in the forecast horizon.

6.3.2 Scenario 2 - Annual Rate Adjustment

Gradual annual increases of 7.5 percent over 10 years were evaluated to meet the annual revenue needs and to limit the ending fund balance in FYE 2021 to approximately $2.6 million. This analysis is presented in Table 6.7. As seen from Table 6.7, the annual rate adjustment approach results in negative R&R reserve fund balances for 9 out of the 10 years. This prolonged negative reserve balance could be limited or avoided by a transfer from alternate unrestricted funds for FYE 2012 or continued transfers of alternate unrestricted reserves.

6.3.3 Scenario 3- One-Time Adjustment

A rate adjustment scenario where a large one-time upfront adjustment with no follow on rate adjustment was evaluated. The result of this scenario is summarized in Table 6.8. If a one-time initial rate adjustment is implemented instead of annual rate increase, a 51-percent rate increase is required in FYE 2012 to provide the necessary R&R reserve

Table 6.6 Scenario 1 - No Rate Adjustment
Asset Reliability Assessment and Financial Plan
City of Simi Valley

	FYE 2012	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021
Operating Fund										
Operating Fund Revenues	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500
Revenue from Rate Increase	0	0	0	0	0	0	0	0	0	0
Less: Operating Fund Expense	(12,480,605)	(12,792,620)	(13,112,436)	(13,440,247)	(13,776,253)	(14,120,659)	(14,473,675)	(14,835,517)	(15,206,405)	(15,586,565)
Gross Operating Fund Cash Flow	**2,441,895**	**2,129,880**	**1,810,064**	**1,482,253**	**1,146,247**	**801,841**	**448,825**	**86,983**	**(283,905)**	**(664,065)**
Less: Operating Fund Cash Flow	(76,101)	(78,004)	(79,954)	(81,953)	(84,002)	(86,102)	(88,254)	(90,460)	(92,722)	(95,040)
Net Operating Fund Cash Flow	**2,365,794**	**2,051,876**	**1,730,110**	**1,400,301**	**1,062,246**	**715,739**	**360,570**	**(3,478)**	**(376,627)**	**(759,105)**
R&R Fund										
Beginning R&R Fund Balance	4,596,576	2,054,370	(3,224,754)	(9,587,644)	(15,101,343)	(22,573,097)	(31,299,358)	(38,779,787)	(47,062,265)	(56,730,892)
Transfers from Operating Fund	2,365,794	2,051,876	1,730,110	1,400,301	1,062,246	715,739	360,570	(3,478)	(376,627)	(759,105)
Total Working Capital	**6,962,370**	**4,106,246**	**(1,494,644)**	**(8,187,343)**	**(14,039,097)**	**(21,857,358)**	**(30,938,787)**	**(38,783,265)**	**(47,438,892)**	**(57,489,998)**
Less: Cash Financed R&R	(4,908,000)	(7,331,000)	(8,093,000)	(6,914,000)	(8,534,000)	(9,442,000)	(7,841,000)	(8,279,000)	(9,292,000)	(7,964,000)
Ending R&R Fund Balance	**2,054,370**	**(3,224,754)**	**(9,587,644)**	**(15,101,343)**	**(22,573,097)**	**(31,299,358)**	**(38,779,787)**	**(47,062,265)**	**(56,730,892)**	**(65,453,998)**
Proposed Rate Increase	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Avg. Monthly Bill at Start of FY	**$26.08**	**$26.08**	**$26.08**	**$26.08**	**$26.08**	**$26.08**	**$26.08**	**$26.08**	**$26.08**	**$26.08**

Table 6.7 Scenario 2 - Annual Rate Adjustment
Asset Reliability Assessment and Financial Plan
City of Simi Valley

	FYE 2012	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021
Operating Fund										
Operating Fund Revenues	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500
Revenue from Rate Increase	959,958	1,998,771	3,122,655	4,338,316	5,652,429	7,072,377	8,606,939	10,265,122	12,056,637	13,984,070
Less: Operating Fund Expense	(12,480,605)	(12,792,620)	(13,112,436)	(13,440,247)	(13,776,253)	(14,120,659)	(14,473,675)	(14,835,517)	(15,206,405)	(15,586,565)
Gross Operating Fund Cash Flow	**3,401,853**	**4,128,651**	**4,932,719**	**5,820,570**	**6,798,677**	**7,874,218**	**9,055,764**	**10,352,104**	**11,772,732**	**13,320,004**
Less: Operating Fund Cash Flow	(76,101)	(78,004)	(79,954)	(81,953)	(84,002)	(86,102)	(88,254)	(90,460)	(92,722)	(95,040)
Net Operating Fund Cash Flow	**3,325,752**	**4,050,647**	**4,852,765**	**5,738,617**	**6,714,675**	**7,788,117**	**8,967,510**	**10,261,644**	**11,680,010**	**13,224,964**
R&R Fund										
Beginning R&R Fund Balance	4,596,576	3,014,328	(266,025)	(3,506,260)	(4,681,643)	(6,500,967)	(8,154,851)	(7,028,341)	(5,045,697)	(2,657,687)
Transfers from Operating Fund	3,325,752	4,050,647	4,852,765	5,738,617	6,714,675	7,788,117	8,967,510	10,261,644	11,680,010	13,224,964
Total Working Capital	**7,922,328**	**7,064,975**	**4,586,740**	**2,232,357**	**2,033,033**	**1,287,149**	**812,659**	**3,233,303**	**6,634,313**	**10,567,277**
Less: Cash Financed R&R	(4,908,000)	(7,331,000)	(8,093,000)	(6,914,000)	(8,534,000)	(9,442,000)	(7,841,000)	(8,279,000)	(9,292,000)	(7,964,000)
Ending R&R Fund Balance	**3,014,328**	**(266,025)**	**(3,506,260)**	**(4,681,643)**	**(6,500,967)**	**(8,154,851)**	**(7,028,341)**	**(5,045,697)**	**(2,657,687)**	**2,603,277**
Proposed Rate Increase	**7.5%**	**7.5%**	**7.5%**	**7.5%**	**7.5%**	**7.5%**	**7.5%**	**7.5%**	**7.5%**	**7.5%**
Avg. Monthly Bill at Start of FY	**$28.04**	**$30.14**	**$32.40**	**$34.83**	**$37.44**	**$40.25**	**$43.27**	**$46.51**	**$50.00**	**$53.75**

Table 6.8 Scenario 3 - Single Rate Adjustment
Asset Reliability Assessment and Financial Plan
City of Simi Valley

	FYE 2012	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021
Operating Fund										
Operating Fund Revenues	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500	14,922,500
Revenue from Rate Increase	6,527,717	6,550,189	6,572,738	6,595,365	6,617,413	6,638,878	6,660,412	6,682,017	6,703,692	6,721,643
Less: Operating Fund Expense	(12,480,605)	(12,792,620)	(13,112,436)	(13,440,247)	(13,776,253)	(14,120,659)	(14,473,675)	(14,835,517)	(15,206,405)	(15,586,565)
Gross Operating Fund Cash Flow	**8,969,612**	**8,680,069**	**8,382,802**	**8,077,618**	**7,763,660**	**7,440,719**	**7,109,237**	**6,769,000**	**6,419,786**	**6,057,578**
Less: Operating Fund Cash Flow	(76,101)	(78,004)	(79,954)	(81,953)	(84,002)	(86,102)	(88,254)	(90,460)	(92,722)	(95,040)
Net Operating Fund Cash Flow	**8,893,511**	**8,602,065**	**8,302,849**	**7,995,665**	**7,679,658**	**7,354,617**	**7,020,983**	**6,678,539**	**6,327,064**	**5,962,538**
R&R Fund										
Beginning R&R Fund Balance	4,596,576	8,582,087	9,853,152	10,063,001	11,144,666	10,290,325	8,202,942	7,382,924	5,782,464	2,817,528
Transfers from Operating Fund	8,893,511	8,602,065	8,302,849	7,995,665	7,679,658	7,354,617	7,020,983	6,678,539	6,327,064	5,962,538
Total Working Capital	**13,490,087**	**17,184,152**	**18,156,001**	**18,058,666**	**18,824,325**	**17,644,942**	**15,223,924**	**14,061,464**	**12,109,528**	**8,780,065**
Less: Cash Financed R&R	(4,908,000)	(7,331,000)	(8,093,000)	(6,914,000)	(8,534,000)	(9,442,000)	(7,841,000)	(8,279,000)	(9,292,000)	(7,964,000)
Ending R&R Fund Balance	**8,582,087**	**9,853,152**	**10,063,001**	**11,144,666**	**10,290,325**	**8,202,942**	**7,382,924**	**5,782,464**	**2,817,528**	**816,065**
Proposed Rate Increase	**51.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Avg. Monthly Bill at Start of FY	**$39.38**	**$39.38**	**$39.38**	**$39.38**	**$39.38**	**$39.38**	**$39.38**	**$39.38**	**$39.38**	**$39.38**

fund balance for upcoming project needs. However, as seen from the table, this rate scenario results in the lowest monthly rate in the forecast horizon and achieves positive R&R reserve fund balances in all 10 years.

6.4 CONCLUSIONS

The City of Simi Valley utilizes a pay-as-you-go method to finance its R&R CIP using its sanitation and sewerline replacement reserves. A financial forecast was developed for a 10-year horizon for the replacement reserve to determine the rate impacts of funding the necessary aboveground and belowground R&R needs over the 10-year period.

Several key assumptions were made in the development of the financial forecast. These include:

- Forecast horizon of 10 years for both the aboveground and belowground R&R CIP.
- The analysis was developed in 2011 dollars without consideration of inflationary effects, except for an assumed 2.5 percent annual increase in O&M costs.
- Zero-percent interest will be generated on reserve fund balance.
- Continuation of the pay-as-you-go financing mechanism with no use of debt or other instruments for project financing.
- Continuation of annual fund transfer of $1.975 million into the sewer replacement fund.
- No use of grants, loans, developer contributions, connection fees, or other charges as a source of revenue for the replacement fund.
- No annual maximum or minimum replacement fund balance will be required.
- Replacement reserves will be used for payment of the R&R CIP only.
- All EDUs will contribute revenues equivalent to the current monthly single-family residential rate of $26.08 in FY 2011.
- EDU growth will occur at a rate equivalent to the annual projected population growth for the City.
- Revenue growth will be equivalent to the compounded account growth rate and rate adjustment.

Using the above assumptions, three reserve fund scenarios were evaluated:

1. Scenario 1 - No Rate Adjustment.
2. Scenario 2 - Annual Rate Adjustment to obtain a positive fund balance by the year 2021.
3. Scenario 3 - One-Time Rate Adjustment to meet R&R CIP needs while minimizing the fund balance.

A summary of the rate adjustments and ending fund balance in FYE 2021 for the three rate scenarios is presented in Table 6.9.

Since the City sanitation replacement fund is not starting with a fund balance that could support its near term CIP needs, if the City proposes to continue to use a pay-as-you-go financing method, significant rate adjustments are required in the near term to meet these R&R needs. Additional rate adjustments may be necessary to meet operations and other sanitation fund expenditures.

It is recommended that the City conduct a comprehensive rate study to determine the total rate adjustment needed to meet R&R and other expense needs. In the event that implementation of the rate adjustments needed for R&R projects is not viable, the City and its financial advisors should evaluate opportunities to transfer alternate unrestricted funds to the R&R reserve to meet near-term needs or utilize debt financing to smooth CIP impacts. These alternatives, coupled with gradual rate adjustments may provide the City the funding necessary to meet its near- and longer-term R&R CIP needs.

Table 6.9 Scenario Summary
Asset Reliability Assessment and Financial Plan
City of Simi Valley

	FYE 2012	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021	Ending Fund Balance in FYE 2021	Single-Family Residential Rate in FYE 2021
Rate Adjustment[1]												
Scenario 1 - No Rate Adjustment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	($65,453,998)	$26.08
Scenario 2 - Annual Rate Adjustment	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	$2,603,277	$53.75
Scenario 3 - One Time Adjustment	51.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$816,065	$39.38

Notes:
1. Rate adjustment presented is that required to meet R&R CIP needs only. Additional rate adjustments may be necessary to determine increase required to meet total sanitation fund expenses.