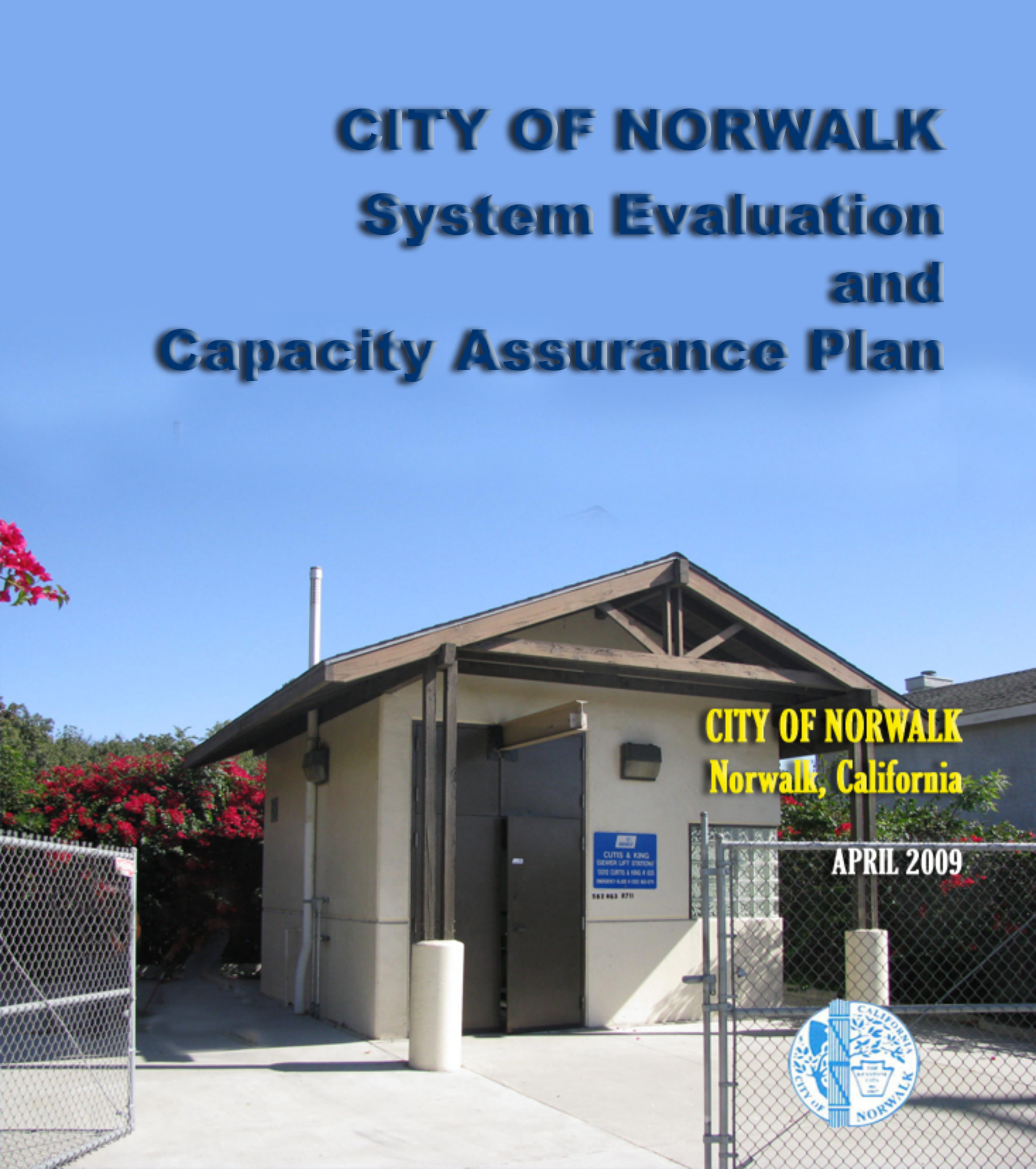
CITY OF NORWALK
System Evaluation and Capacity Assurance Plan



CITY OF NORWALK
Norwalk, California

APRIL 2009

CITY OF NORWALK

SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

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APRIL 2009

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CERTIFICATION

CITY OF NORWALK
SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Delfino Consunji, P.E.
City Engineer

Date

1.0 INTRODUCTION AND REQUIREMENT

1.1 Introduction

The City of Norwalk (City) sewer system serves the area consisting of all lands within its corporate boundaries (9.35 square miles) as well as a portion of the City of Santa Fe Springs (148 acres) at the northern and southeastern abutment to the City. The City provides sewer service to a population of approximately 109,700. The existing sewer collection system consists of about 865,000 feet (164 miles) of gravity sewers ranging in size from 6-inches to 18-inches in diameter, including 16 siphons. The City also owns three lift stations with approximately 162 feet of force main. The existing system is shown on Figure 1.

The City's latest Sewer Master Plan was completed in July 1991. Portions of the gravity sewer system, primarily the main lines, and the lift stations were evaluated at that time. Recommendations were made for replacement pipes and/or parallel pipes, as well as upgrades to the three sewer lift stations.

Since the 1991 Sewer Master Plan, the City has completed the following projects:

- Reconstructed Harvard Gridley Lift Station in 1997 with an 8-foot diameter wet well, two slide rail submersible vortex pumps, a valve vault containing the discharge check and isolation valves, a force main bypass connection, and a 6-inch ductile iron force main.
- Converted the dry well of the previous Bloomfield Molette Lift Station to the current wet well in 1999. Added a valve vault housing the check valves and isolation valves. Added a bypass pumping connection.
- Upgraded Curtis & King Lift Station with new dry pit submersible vortex pumps, an ultrasonic level transducer, back-up float switches, and a new pump control panel in 2008

Capacity evaluation of the system is a requirement of Order No. 2006-0003, Statewide General Waste Discharge Requirements, issued by the State Water Resources Control Board on May 2, 2006.

1.2 Requirement

The preparation of the System Evaluation and Capacity Assurance Plan is required by Order No. 2006-0003 issued by the State Water Resources Control Board on May 2, 2006.

Providing adequate capacity in the gravity collection system and lift stations is a very important component of a collection agency's responsibility in minimizing the possibility of sanitary sewer overflows.

The following provisions of the Order define the requirements for the System Evaluation and Capacity Assurance Plan:

Provision D.10

The Enrollee shall provide adequate capacity to convey base flows and peak flows, including flows related to wet weather events. Capacity shall meet or exceed the design criteria as defined in the Enrollee's System Evaluation and Capacity Assurance Plan, for all parts of the sanitary sewer system owned or operated by the Enrollee.

CITY OF DOWNEY

CECILIA ST

FIRESTONE BLVD

UPRR

STUDEBAKER RD

ORR & DAY RD

PIONEER BLVD

NORWALK BLVD

BLOOMFIELD AVE

LAKELAND RD

CITY OF SANTA FE SPRINGS

IMPERIAL HWY

I-605 SAN GABRIEL FWY

I-5 SANTA ANA FWY

IMPERIAL HWY

I-105 CENTURY FWY

Curtis and King PS

METROLINK

CARMENITA RD

FOSTER RD

LEFFINGWELL RD

ROSECRANS AVE

ROSECRANS AVE

FIRESTONE BLVD

UPRR

SAN GABRIEL RIVER

EXCELSIOR DR

Bloomfield Molette PS

ALONDRA BLVD

ALONDRA BLVD

BLOOMFIELD AVE

SHOEMAKER AVE

166TH ST

Harvard Gridley PS

166TH ST

STUDEBAKER RD

PIONEER BLVD

NORWALK BLVD

CITY OF ARTESIA

CITY OF CERRITOS

Legend

- City Boundary
- City of Norwalk Gravity Sewer
- Private Sewers
- Los Angeles County Sanitation District Sewer
- City of Norwalk Pump Station
- City of Norwalk Pump Station Tributary Area
- City of Santa Fe Springs Tributary Area

N

4,400 2,200 0 Feet

City of Norwalk
System Evaluation and Capacity Assurance Plan

Existing Sewer System

Figure 1

Provision D.13. (Viii)

System Evaluation and Capacity Assurance Plan: The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

(a) Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;

(b) Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and

(c) Capacity Enhancement Measures: The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

(d) Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D.14..

2.0 SYSTEM HYDRAULIC MODEL

A calibrated static hydraulic model of City's sewer collection system was prepared for evaluating the capacity of the existing system, and its ability to handle the flows from planned future development.

The City was divided into two sections and a hydraulic model was created for the area north and the area south of Firestone Boulevard:

- The North model primarily covers the sewer lines located northeast of Firestone Boulevard. A few smaller sections southwest of Firestone Boulevard (from Studebaker Road to Jersey Avenue and from the alley west of Thornlake Avenue to Dartmoor Avenue) are included in this model as well.

- The South model primarily covers the sewer lines located southwest of Firestone Boulevard with the exception of the sections mentioned above. All three lift stations owned and maintained by the City are included in the South model.

3.0 GEOMETRIC MODEL

The geometry of the hydraulic models was based on the City's newly developed Sewer GIS. The Sewer GIS was based on as-built construction plans and includes all of the City's manholes, sewer lines, forcemains, and lift station locations. Information included in the Sewer GIS is as follows:

Manhole Information

- Identification Number
- Structure Type
- Rim Elevation
- Invert Elevation
- Street Location
- Plan Number

Pipe Information

- Pipe Identification Number
- Upstream and Downstream Manhole Identification Number
- Upstream and Downstream Station
- Upstream and Downstream Invert Elevation
- Pipe Size
- Pipe Length
- Pipe Slope
- Pipe Material
- Street Location
- Plan Number

As-built plans were not available for approximately 3.2 percent (117 out of 3,648 reaches) of the system. Due to time and budget constraints, assumptions were made to estimate the missing invert elevations and complete the geometric model. Generally, the following logic was implemented when estimating invert elevations:

1. If inverts were recorded for adjacent upstream and downstream pipes, these inverts were also used for the pipe with missing invert data.
2. Inverts were calculated by applying the same slope found in adjacent upstream or downstream pipes.
3. Assuming that adjacent streets in the same direction have similar slopes and the sewer slopes parallel street grade, inverts were calculated by applying sewer slopes in adjacent streets.

4.0 LAND USE

The land use information utilized in this study was based upon the City's current General Plan Land Use map, shown on Figure 2. The City's General Plan Land Use Map specified four major categories: Residential, Commercial, Industrial, and Other. The "other" land use category includes open space, schools, public facilities, and institutional uses. For this study, schools and hospitals were identified separately so that individual unit flow factors could be developed and applied to the hydraulic model for these uses.

The City of Santa Fe Springs General Plan Land Use map was utilized to estimate sewage loads generated in Santa Fe Springs but tributary to the City of Norwalk sewer system.

5.0 FLOW MONITORING

Data collection and review is essential in developing unit flow factors, calibration the system model, and estimating the ultimate average day and peak flows.

In order to estimate the residential, commercial, and industrial wastewater flows n the City, a temporary flow monitoring study was conducted by ADS Environmental Services over a period of two weeks at three locations. The selected flow monitoring locations and a summary of the results are shown on Figure 3 and in Table 1. From past experience, it is known that flow monitoring results can be inconsistent if the depth of flow in the sewer is too low.The three flow monitoring locations were selected because they had the largest tributary areas in the City and consisted of primarily low density residential homes, the most prominent land use in the City. The monitors were in place from August 13, 2008 to August 26, 2008. The measured flows are graphically depicted on Figure 4.

Table 1
Flow Monitoring Results

Site ID	Manhole ID	Pipe Size (in)	Location	Minimum Flow (mgd)	Average Flow (mgd)	Maximum Flow (mgd)
1	1211	15	Dune Rd, w/o Orr & Day Rd	0.094	0.370	0.643
2	6349	15	Gridley Rd, n/o Hayford St	0.071	0.293	0.528
3	5323	15	Studebaker Rd, n/o Leffingwell Rd	0.140	0.464	0.820

CITY OF DOWNEY
CECILIA ST
STUDEBAKER RD
ORR & DAY RD
PIONEER BLVD
NORWALK BLVD
BLOOMFIELD AVE
LAKELAND RD
FIRESTONE BLVD
UPRR
CITY OF SANTA FE SPRINGS
IMPERIAL HWY
I-605 SAN GABRIEL FWY
I-5 SANTA ANA FWY
I-105 CENTURY FWY
FOSTER RD
METROLINK
CARMENITA RD
LEFFINGWELL RD
ROSECRANS AVE
SAN GABRIEL RIVER
EXCELSIOR DR
ALONDRA BLVD
SHOEMAKER AVE
166TH ST
CITY OF ARTESIA
CITY OF CERRITOS

Legend

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Light Industrial
- Heavy Industrial
- Institutional / Public Facility / School
- Open Space
- Existing Hospital
- Existing Air Force Fuel Storage Facility
- Existing Public School
- Existing Church
- City Boundary

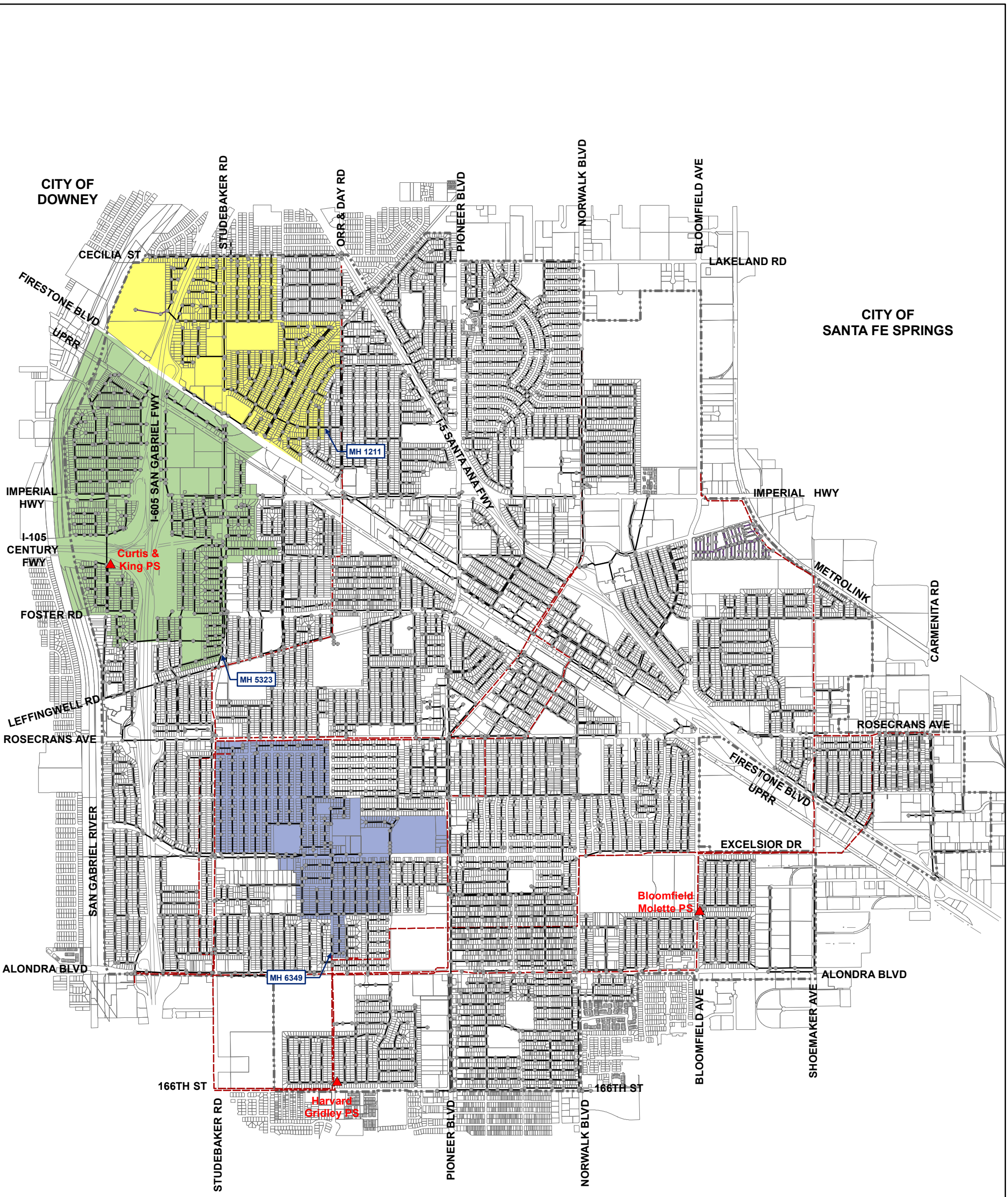
N

4,400 2,200 0 Feet

City of Norwalk
System Evaluation and Capacity Assurance Plan

General Plan Land Use

Figure 2

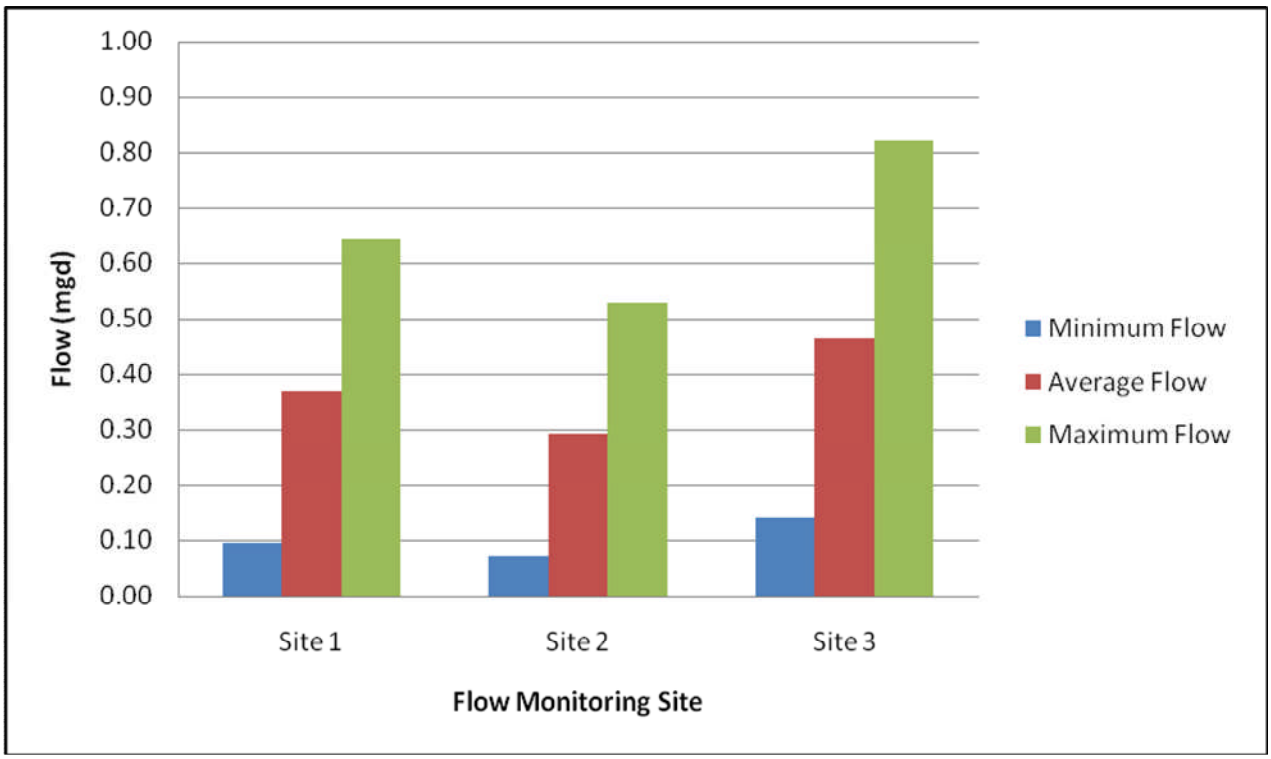


City of Norwalk
System Evaluation and Capacity Assurance Plan

Flow Monitoring Locations and Tributary Areas

Figure 3

Figure 4
Measured Flow Data



6.0 UNIT FLOW FACTORS

Unit flow factors utilized in this study were developed based upon the land uses discussed in Section 4.0 and the results of the flow monitoring study discussed in Section 5.0. Water use records, aerial photographs and field reviews supplemented this information.

The average daily flow recorded at each flow monitoring site was utilized in determining calibrated existing unit flow factors for each land use. These existing flow factors were then increased by 4 percent for residential land uses and 5 percent for commercial and industrial land uses to develop the ultimate flow factors. This increase accounts for vacancies, inconsistencies in the flow monitoring data, and future densification. Open space and hospital loads are the same for existing and ultimate conditions, assuming that no further expansion will take place. The unit flow factors developed for this study are shown in Table 2.

Table 2
Unit Flow Factors

Land Use Designation	Land Use	Existing Unit Flow Factor	Ultimate Unit Flow Factor	Units
LDR	Low Density Residential	1,800	1,870	gal/ac
MDR	Medium Density Residential	2,000	2,080	gal/ac
HDR	High Density Residential	3,200	3,300	gal/ac
NC	Neighborhood Commercial	1,000	1,050	gal/ac
PO	Professional Offices	1,000	1,050	gal/ac
GC	General Commercial	1,000	1,050	gal/ac
LI	Light Industrial	400	420	gal/ac
HI	Heavy Industrial	800	840	gal/ac
PUB_SCHL	Schools	600	630	gal/ac
PARK	Open Space	200	200	gal/ac
INS	Institutional	1,000	1,050	gal/ac
HOSPITAL	Hospitals	85	85	gal/bed

The details of the hospitals in the City, for which sewage flows are estimated, are listed in Table 3.

Table 3
Hospitals

Name of Hospital	Location	No. of Beds
State Metropolitan Hospital	Norwalk Blvd, south of Lakeland Dr	960
Coast Plaza Hospital	Studebaker Rd, north of Foster Rd	12
Norwalk Community Hospital	Bloomfield Ave, north of Foster Rd	50

7.0 AVERAGE DRY WEATHER FLOWS

The average dry weather wastewater flows were determined as the sum of the product of tributary areas and their respective unit flow factors, plus point loads for hospitals and flows from the City of Santa Fe Springs.

Wastewater flow generated in the City of Santa Fe Springs enters the City of Norwalk's collection system at the locations listed in Table 4. The average dry weather flows at these locations were estimated based upon the tributary areas, the associated land uses and the unit flow factors listed in Table 2. The sewage from a total area of approximately 148 acres within the City of Santa Fe Springs is tributary to the City of Norwalk's collection system.

Table 4
City of Santa Fe Springs Flows

Manhole ID	Location where flow enters the City of Norwalk sewer system	Land Use Type	Area (Ac)	ADWF (mgd)
1534	Norwalk Blvd, north of Tina St	GC and HI	73	0.059
2357	Ringwood Ave, east of I-5	LDR	8	0.014
7043	Shoemaker Ave, at Molette St	HI	39	0.031
7045	Shoemaker Ave, at Arctic Cir	HI	28	0.023
		Total	**148**	**0.127**

8.0 PEAKING CRITERIA

The goal of the City of Norwalk is to provide sufficient capacity to convey the design peak wet weather flow in its collection system pipes at or below a depth to diameter ratio of 0.82.

Design Flows

The peak wet weather flow consists of peak dry weather flow, which is observed daily during dry weather periods, plus flows which enter the system during storm events as inflow and infiltration.

Based upon the best information currently available, the following methodology is used in determining the average dry weather, peak dry weather and peak wet weather flows:

1. Average Dry Weather Flow

   Average dry weather flow in any pipe is calculated as the summation of the product of the area of each type of land use tributary to that pipe and its respective unit wastewater flow factor.

   Contribution from unique wastewater flow generators is determined separately in order to accurately calculate the average dry weather flows. This includes developments such as the hospitals.

2. Peak Dry Weather Flow

   Peak dry weather flow is calculated from average dry weather flow utilizing the following formula:

   $$PDWF = 1.66 \times ADWF^{0.92}$$

   Where, PDWF = Peak dry weather flow (mgd)
   ADWF = Average dry weather flow (mgd)

   Average dry weather flow (ADWF) and peak dry weather flow (PDWF) are in units of million gallons per day (mgd). This formula was developed from the three flow monitoring sites discussed in Section 5.0.

3. Peak Wet Weather Flow

   The peak wet weather flow consists of peak dry weather flow, which is observed daily during dry weather periods, plus flows which enter the system during storm events as inflow and infiltration.

The City's goal is to provide sufficient capacity to convey the peak dry weather flow in its collection system pipes at or below a depth to diameter ratio of 0.64. The additional area in the pipe, which is equivalent to about 35 percent of the total flow capacity, is reserved for wet weather flows.

The flow monitoring information for this study did not cover a rainy period. Therefore, information that can be used in developing a relationship between average dry weather and peak wet weather flow for the City's system is not available. Upon completion of a thorough inflow and infiltration study, development of wet weather criteria will be attempted. The hydraulic analysis will then be updated to ensure that the collection system pipes can convey wet weather flows at a depth to diameter of 0.82 (full pipe capacity).

In the absence of detailed I/I studies, it is recommended that the peak wet weather flow be estimated as the following:

PWWF = 1.35 x PDWF

Where, PWWF = Peak wet weather flow (mgd)
PDWF = Peak dry weather flow (mgd)

4. Lift station Peak Flow Criteria

The minimum firm pumping capacity for lift stations is the larger of the following:

PWWF = 1.35 x PDWF or

PWWF = 3.0 x ADWF

Where, PWWF = Peak wet weather flow (mgd)
PDWF = Peak dry weather flow (mgd)
ADWF = Average dry weather flow (mgd)

9.0 TRIGGER DEPTH TO DIAMETER RATIOS

Existing Collection System Pipes

In order to meet the above criteria, the existing collection system pipes are considered capacity deficient when the calculated depth to diameter ratio is equal to or greater than 0.64. The capacity available between depth to diameter ratios of 0.64 and 0.82 is reserved for wet weather flows.

New Collection System Pipes

All collection system pipes 15 inches in diameter and smaller will be designed to flow at or below a depth to diameter ratio of 0.50 with peak dry weather flows. The capacity available between depth to diameter ratios of 0.50 and 0.82 is reserved for wet weather flows.

New pipes 18 inches in diameter and larger will be designed to flow at or below a depth to diameter ratio of 0.64. The capacity available between depth to diameter ratios of 0.64 and 0.82 is reserved for wet weather flows.

Where possible, a minimum velocity of 2.0 feet per second will be provided with average dry weather flows.

10.0 HYDRAULIC ANALYSIS

Since the City's service area is mostly developed, the hydraulic analyses were conducted utilizing fully developed and occupied tributary areas with peak dry weather flows.

The capacity deficiencies identified through hydraulic analysis are illustrated on Figure 5. Summary of the results for the model calculated capacity deficient reaches is provided in Table 5. A total of 2,043 feet of sewer was identified to be capacity deficient under existing conditions. A total of 1,528 feet of sewer was identified to be capacity deficient under ultimate conditions. The ultimate deficiencies identified considered marginal with d/D ratios just exceeding the established criteria of 0.64. It is recommended that these sewers be considered for replacement based upon its condition assessment. At that time, a larger pipe size can be constructed. All deficiencies should be field verified through flow monitoring before the implementation of any improvement projects.

11.0 LIFT STATION HYDRAULIC CAPACITIES

The City of Norwalk owns and operates three wastewater lift stations. Table 6 includes details of each lift stations, including pump specifications, wetwell dimensions, forcemain size and length, and estimated influent flows.

Typically, sewage lift stations should be designed to pump the expected wet weather flows with the firm capacity of the station. This allows the lift station to be able to sufficiently handle flows during a wet weather event even when one pump is out of operation. As stated in Section 9.0, the wet weather flows in Table 6 were calculated by the following formula:

$$PWWF = 1.35 \times PDWF$$

$$= 1.35 \times (1.66 \times ADWF^{0.92})$$

$$= 2.4 \times ADWF^{0.92}$$

Where, PWWF = Peak wet weather flow (mgd)
PDWF = Peak dry weather flow (mgd)
ADWF = Average dry weather flow (mgd)

Curtis and King Lift Station

The firm capacity of the pump station is 500 gpm which exceeds the existing and ultimate estimated peak wet weather flows of 365 gpm and 379 gpm. Therefore, the existing pump station firm capacity is adequate.

Bloomfield Molette Lift Station

The firm capacity of the pump station is 200 gpm which exceeds the estimated ultimate peak dry weather flow of 179 gpm. However, it is less than the estimated ultimate peak wet weather flow of 275 gpm. When the pumps are replaced, the capacity should be increased to 300 gpm so that the entire peak wet weather flow can be pumped by a single pump.

Harvard Gridley Lift Station

The firm capacity of the pump station is 380 gpm which exceeds the existing and ultimate estimated peak wet weather flows of 182 gpm and 280 gpm. Therefore, the existing pump station firm capacity is adequate.

City of Norwalk
System Evaluation and Capacity Assurance Plan

Calculated Hydraulic Deficiencies

Figure 5

Table 5
Pipes with Calculated Capacity Deficiencies

Location No.	Pipe ID	U/S MH ID	D/S MH ID	Location	Size (in)	Length (ft)	Slope	Average Dry Weather Flow (mgd)	Peak Dry Weather Flow (mgd)	PDWF Velocity (ft/s)	PDWF d/D	PDWF Water Depth (ft)	Full Flow (mgd)	Comments
1	2215	1603	1629	Easement between Allard St and Cyclops St, from Bombardier Ave to Norwalk Blvd	8	267	0.0012	0.1495	0.2889	1.74	0.69	0.46	0.3524	Verify deficiency through flow monitoring
	2216	1629	1630		8	346	0.0012	0.1523	0.2938	1.76	0.69	0.46	0.3547	
	2217	1630	1631		8	346	0.0012	0.1549	0.2984	1.76	0.70	0.47	0.3547	
	2218	1631	1628		8	340	0.0012	0.1581	0.3042	1.74	0.72	0.48	0.3490	
	2260	1628	1652	Norwalk Blvd, south of Allard St	8	296	0.0012	0.4285	0.7611	3.37	1.00	0.67	0.3503	
	9555	1652	9135		8	348	0.0012	0.4785	0.8425	3.73	1.00	0.67	0.3537	
2	5267	7198	6634	Pioneer Blvd at Hopland St	8	43	0.0024	0.2117	0.3978	2.43	0.68	0.45	0.4932	Verify slope (As-built plans not available); If still deficient per model, verify deficiency through flow monitoring
	5268	6633	7198		8	57	0.0025	0.2117	0.3978	2.48	0.67	0.45	0.5045	
3*	6423	5532	5530	Curtis & King Rd, north of Foster Rd	8	280	0.0022	0.1845	0.3506	2.32	0.64	0.42	0.4790	Located d/s of Curtis King Pump Station; Marginal deficiency; Replace on condition
	6424	5530	5528		8	269	0.0022	0.1860	0.3533	2.30	0.64	0.43	0.4727	
	6425	5528	5525		8	182	0.0022	0.1860	0.3533	2.32	0.64	0.43	0.4771	
	9192	5525	5526		8	119	0.0024	0.1999	0.3775	2.41	0.65	0.44	0.4940	
4*	6456	5395	5400	I-605 San Gabriel Fwy crossing from Flatbush Ave to Behrens Ave	8	203	0.0032	0.2315	0.4320	2.80	0.65	0.43	0.5759	Marginal deficiency; Replace on condition
5*	1688	9128	1865	Easement between Firestone Blvd and Front St, southeast of Norwalk Blvd	8	348	0.0012	0.1381	0.2685	1.72	0.65	0.43	0.3536	Marginal deficiency; Replace on condition
	9553	1842	9128		8	127	0.0012	0.1340	0.2613	1.70	0.64	0.43	0.3499	
					Total	**3,571**								

Notes:

** Existing deficiency*

** Future deficiency only*

ADWF = Average Dry Weather Flow

PDWF = Peak Dry Weather Flow

Table 6
Existing Sewage Lift Stations

Lift Station Information										Pump Specifications					Existing Flow at Lift Station			Ultimate Flow at Lift Station		
Station No.	Lift Station Name	Address	Date of Cons.	Plan No.	Area Served (Acres)	FM Dia (in)	FM Length (ft)	FM Mat	Wet Well Dimensions	Pump No.	Pump Type	RPM	TDH (ft)	Flow Capacity (gpm)	ADWF (gpm)	PDWF (gpm)	PWWF (gpm)	ADWF (gpm)	PDWF (gpm)	PWWF (gpm)
1	Curtis and King	15402 Curtis & King Road	1989	I-105 Century Project 42	143	6	50	CIP	7' Dia x 8'-0"	1	Dry Pit Submersible Vortex	1150	15	500	122	232	365	126	241	379
										2	Dry Pit Submersible Vortex	1150	15	500						
2	Bloomfield Molette	15402 Bloomfield Avenue	1999	B-911	65	6	42	DIP	10'-6" x 9'-6" x 20'-4"	1	Slide Rail Submersible Vortex	1150	15	200	88	172	264	92	179	275
										2	Slide Rail Submersible Vortex	1150	15	200						
3	Harvard Gridley	11402 Harvard Avenue	1997	B-910	130	6	70	DIP	8' Dia x 27.2'	1	Slide Rail Submersible Vortex	1150	24	380	90	176	237	93	182	280
										2	Slide Rail Submersible Vortex	1150	24	380						

12.0 CAPITAL IMPROVEMENT PROGRAM FOR CAPACITY IMPROVEMENTS

The capital improvement program for capacity improvements is formulated to eliminate the deficiencies in accordance with City's criteria. In prioritizing the capacity improvement projects, those sewers identified with capacity deficiencies under existing conditions were given higher priority than those deficiencies identified under ultimate conditions.

The capacity improvement projects recommended are based upon the best information currently available. Detailed studies will be necessary to formulate the precise scope of each project. The City of Norwalk will flow monitor its system, particularly in the areas where the hydraulic model indicates capacity deficiencies. The recommended priorities will be adjusted based upon the actual need.

The recommended capacity improvement projects are shown on Figure 6. Table 7 provides a prioritized listing of the recommended projects, as well as their implementation costs. The costs provided are estimated replacement costs, assuming the under capacity pipe can be replaced with a larger pipe in the same alignment with the same slope.

The collection system construction estimates are based upon replacement at $45 per diameter inch per foot of pipe. Implementation cost is determined by adding 35 percent of construction cost to cover engineering, inspection, and administration.

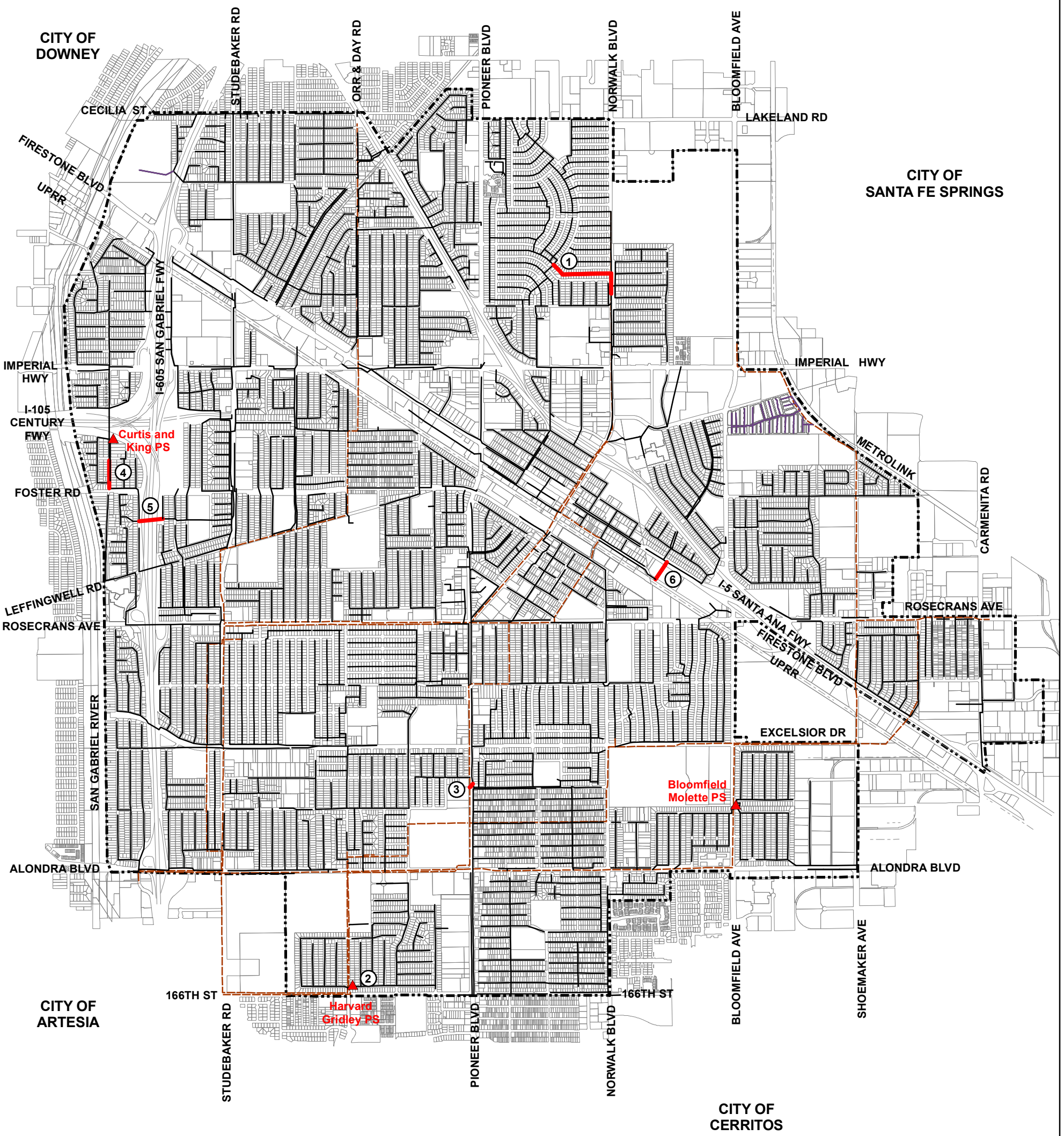
The total estimated cost of the capacity related capital improvement projects is $3,648,000.

13.0 FUNDING PLAN

The City of Norwalk will complete a rate study concurrent with the completion of its short term and long term capital improvement program (CIP). This study will recommend a wastewater generation based rate structure that will generate sufficient revenues for proper operation and maintenance of the collection system, and implement the selected CIP.

Table 7
Recommended Capacity Improvement Projects

Project No.	Pipe ID	U/S MH ID	D/S MH ID	Location	Size (in)	Length (ft)	Slope	New Size (in)	Total Project Cost ($)
1	2215	1603	1629	Easement between Allard St and Cyclops St, from Bombardier Ave to Norwalk Blvd	8	267	0.0012	12	194,628
	2216	1629	1630		8	346	0.0012	12	252,234
	2217	1630	1631		8	346	0.0012	12	252,234
	2218	1631	1628		8	340	0.0012	12	248,108
	2260	1628	1652	Norwalk Blvd, south of Allard St	8	296	0.0012	18	323,228
	9555	1652	9135		8	348	0.0012	18	380,538
2	Upsize pumps to 300 gpm each and upgrade electrical if necessary								810,000
3	5267	7198	6634	Pioneer Blvd at Hopland St	8	43	0.0024	12	31,061
	5268	6633	7198		8	57	0.0025	12	41,557
4	6423	5532	5530	Curtis & King Rd, north of Foster Rd	8	280	0.0022	12	204,120
	6424	5530	5528		8	269	0.0022	12	196,101
	6425	5528	5525		8	182	0.0022	12	132,744
	9192	5525	5526		8	119	0.0024	12	86,685
5	6456	5395	5400	I-605 San Gabriel Fwy crossing from Flatbush Ave to Behrens Ave	8	203	0.0032	12	148,082
6	1688	9128	1865	Easement between Firestone Blvd and Front	8	348	0.0012	12	253,831
	9553	1842	9128		8	127	0.0012	12	92,583
								Total	**3,647,733**



City of Norwalk
System Evaluation and Capacity Assurance Plan

Recommended Capacity Improvement Projects

Figure 6


CALIFORNIA
CITY OF
NORWALK