

1.1 EXECUTIVE SUMMARY

The purpose of this report is to update the 2007 Master Plan with up to date information, and to revise and update the Capital Improvement Program (CIP) for both of the wastewater treatment plants and the collection system. Some of the new information includes recently completed flow and rainfall monitoring data, updated planning tiers, updated regulations, and recently completed capital improvement projects. The majority of the work performed as part of this update was to incorporate the new flow monitoring and rainfall data into the hydraulic model and reevaluate the need for storage within the collection system.

As with previous versions of the Master Plan, the planning horizons were broken out into Tier I (2040), Tier II (2060), and Tier III (2060 and beyond) planning horizons which can be seen in Figure 1.1. The boundaries for the planning tiers were updated based upon the 2040 Comprehensive Plan. It should be noted that in Figure 1.1, Tier I Priority A (Developing) is land that is within the City limits that is projected to be developed by 2020.

After the new flow and rainfall information was integrated into the model, the majority of the previously required storage was eliminated from the CIP resulting in a decrease of required storage from 42.0 MG to only 5.0 MG. Also, the timing of the sewer projects previously identified in 2007 were updated based on the new planning tiers. The sewer improvements for Tiers I, II, and III can be seen in Figure 1.2, Figure 1.3, and Figure 1.4, respectively. Additionally, recently completed projects and the latest City's CIP were incorporated in the updated long term CIP as part of this update as shown in Figure 1.5.

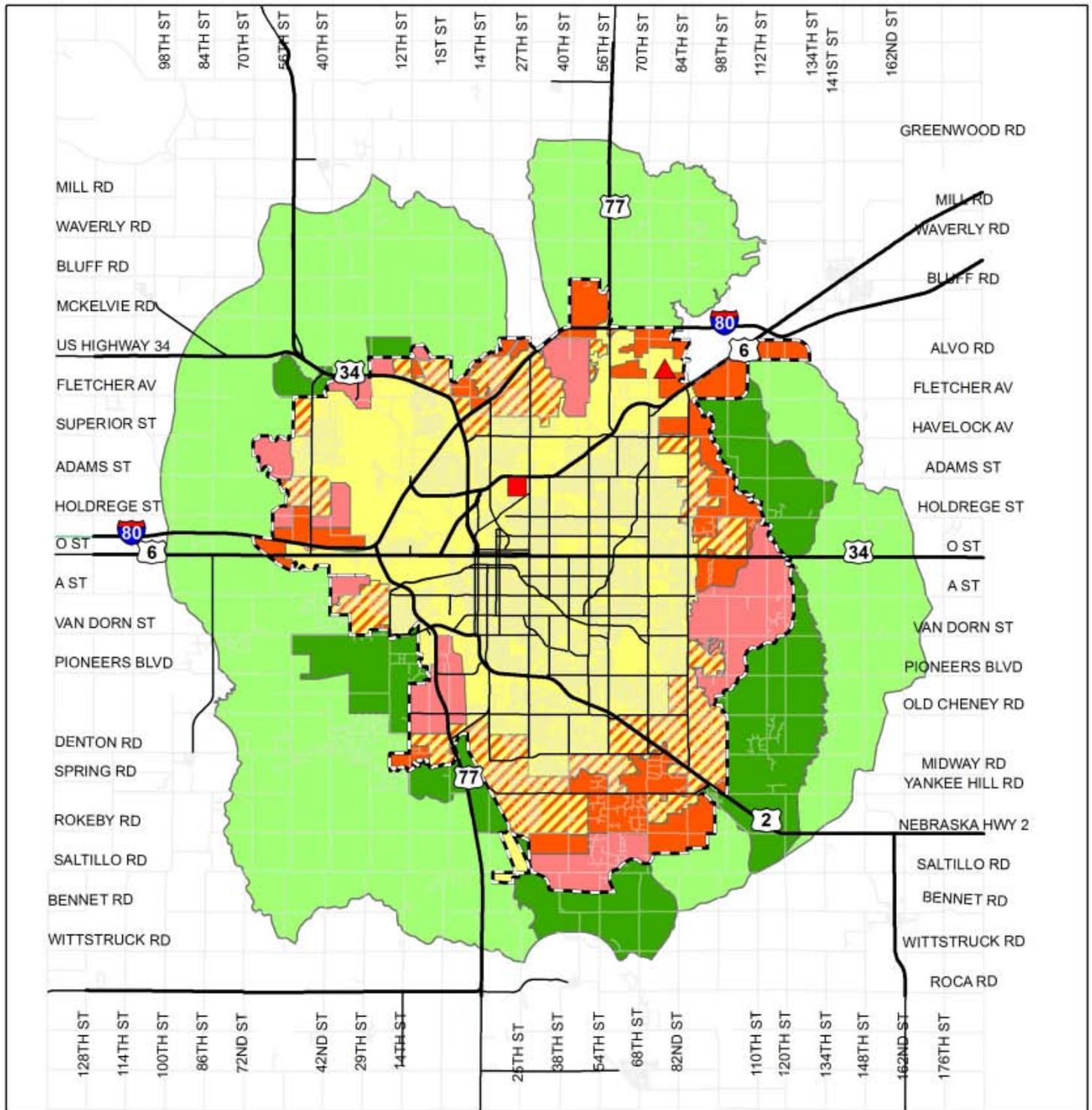
The improvements recommended herein will serve as the basis for the planning, design, and financing of sanitary sewer collection system improvements identified to meet growth and system reliability needs. Planning is a continuous process and recommended improvements may need to be accelerated or deferred to match actual development and as forecasts are replaced with operating records. As with any planning document, the recommendations are schematic in nature and should be thoroughly reviewed and updated during the design process. It is recommended that the City update this collection system master plan periodically as additional data becomes available, and growth occurs. Three Technical Memorandums (TM) were completed concurrently with this Master Plan Update and are included as appendices. These include an analysis of a storm event that took place on September 30 through October 31, 2014 TM, an Update to the Stevens Creek Basin Study Area No. 3 TM, and the Timing of Beals Slough Improvements TM which can be found in Appendix C, D, and E, respectively. Summary of estimated improvement costs and phasing

A critical step in developing the planning costs are ensuring that current needs are being addressed in the master plan. Figure 1.6, Figure 1.7, and Figure 1.8 show the current City CIP projects, collection system improvements, Northeast Waste Water Treatment Facility (WWTF) and Theresa Street WWTF, and the annual City wide improvement costs. The figures include costs illustrating the present value of the project costs and the project costs adjusted for inflation. A summary of the costs for the City CIP, collection system improvements, and the WWTF improvement costs can be seen in Table 1.1, Table 1.2, and Table 1.3, respectively.

1.2 OTHER RECOMMENDATIONS AND SUGGESTIONS

The main purpose of this document is to outline the improvements that will be needed so that the project timing and funding can be planned for. However, during the preparation of the master plan update, other recommendations and suggestions have been noted, as outlined below.

- Continue and expand the sewer cleaning and CCTV programs as the collection in proportion to the expansion of the collection system.
- Consider performing I/I reduction studies on basins in the City that have been identified as areas with a high 'R' factors, possibly starting with a pilot program to determine what defects are being found and the effect that reducing these defects will have on the overall system.
- Continue and possibly expand the flow monitoring program to further define the system characteristics.
- Start the nutrient studies for both wastewater treatment facilities.
- Consider updating the hydraulic model to include smaller pipes. This could be completed in small pieces to meet current and future budgetary constraints.
- Update the Master Plan on a periodic basis, and include the City's current CIP in the analysis.

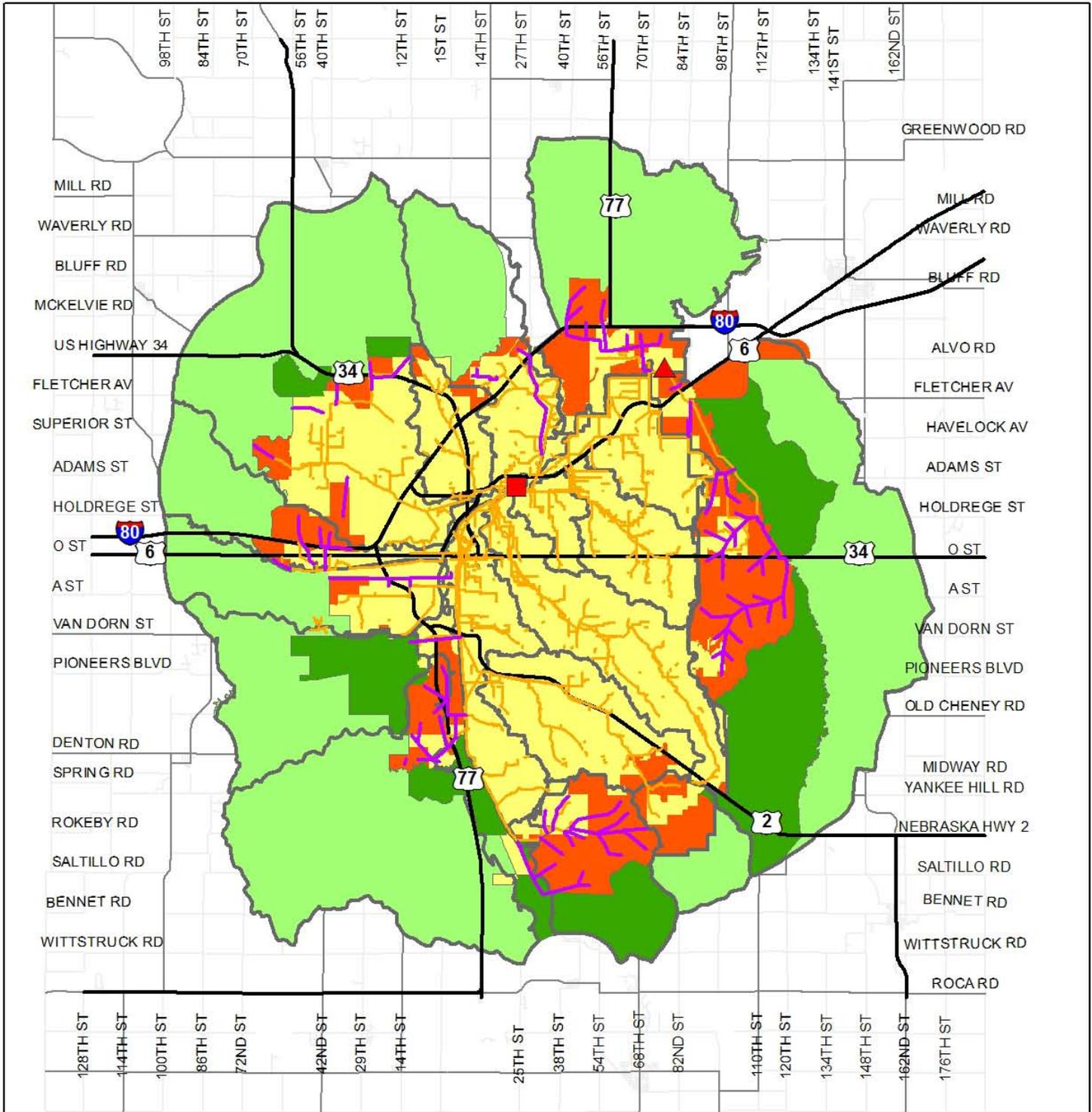


Legend

- Existing City
- Tier I Priority B (2025)
- Tier I Priority A (Developing)
- Tier I Priority C (2040)
- Tier II (2060)
- Tier III
- 2040 Future Service Limit
- Theresa St. WWTP
- Northeast WWTP



FIGURE 1.1 – PLANNING GROWTH TIERS
 WASTEWATER FACILITIES MASTER PLAN UPDATE – 2014
 CITY OF LINCOLN, NEBRASKA



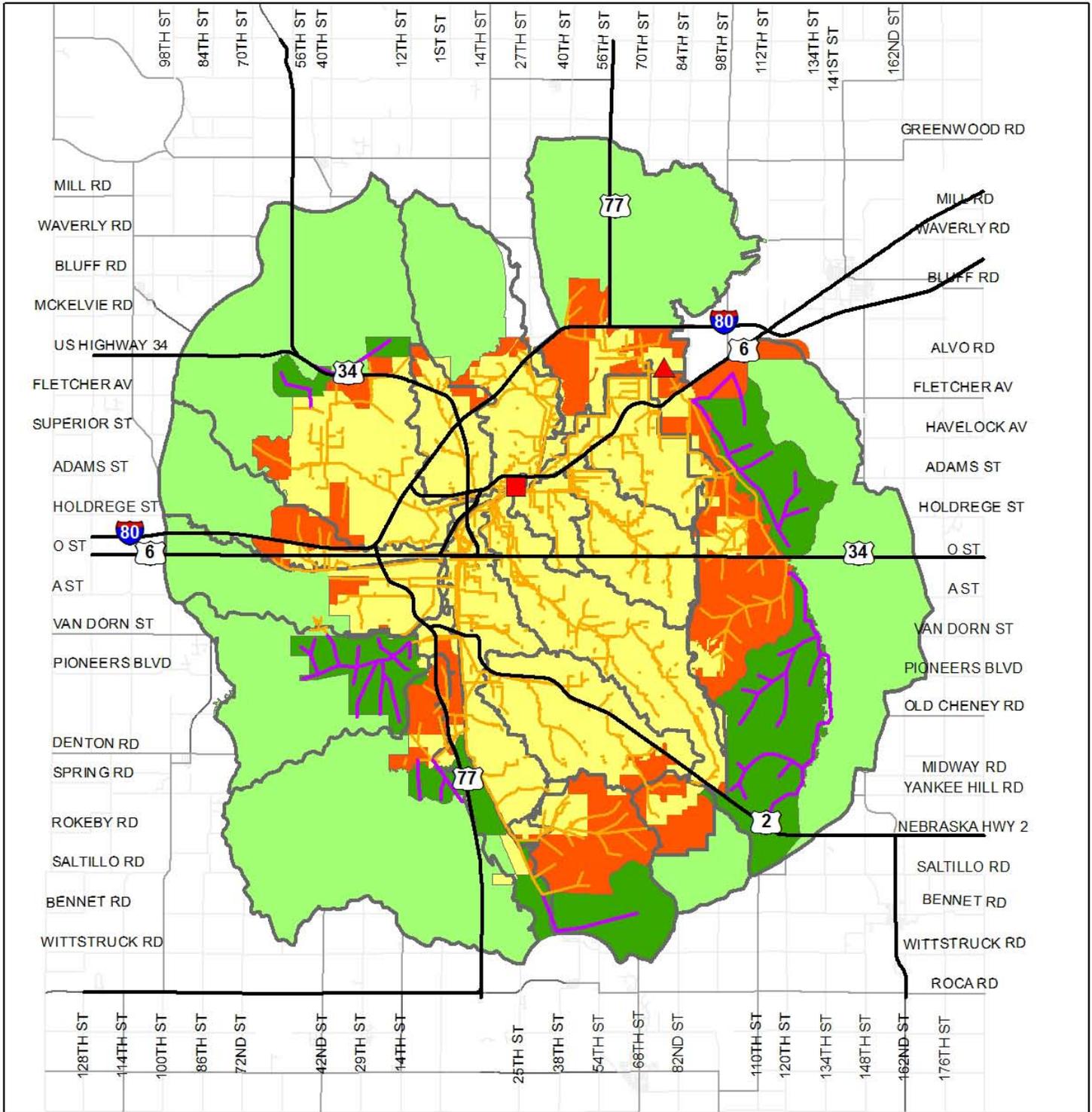
Legend

- Theresa St. WWTP **Growth Tiers**
- ▲ Northeast WWTP
- Basin Outlines
- Existing City ⁽¹⁾
- Tier IB and IC
- Tier II **Pipes**
- Tier III
- Tier I
- Existing Sewers

Notes:
 (1) Represents all land within City limits which includes Tier IA.



FIGURE 1.2 – PLANNING AREA TIER I IMPROVEMENTS
 WASTEWATER FACILITIES MASTER PLAN UPDATE – 2014
 CITY OF LINCOLN, NEBRASKA



Legend

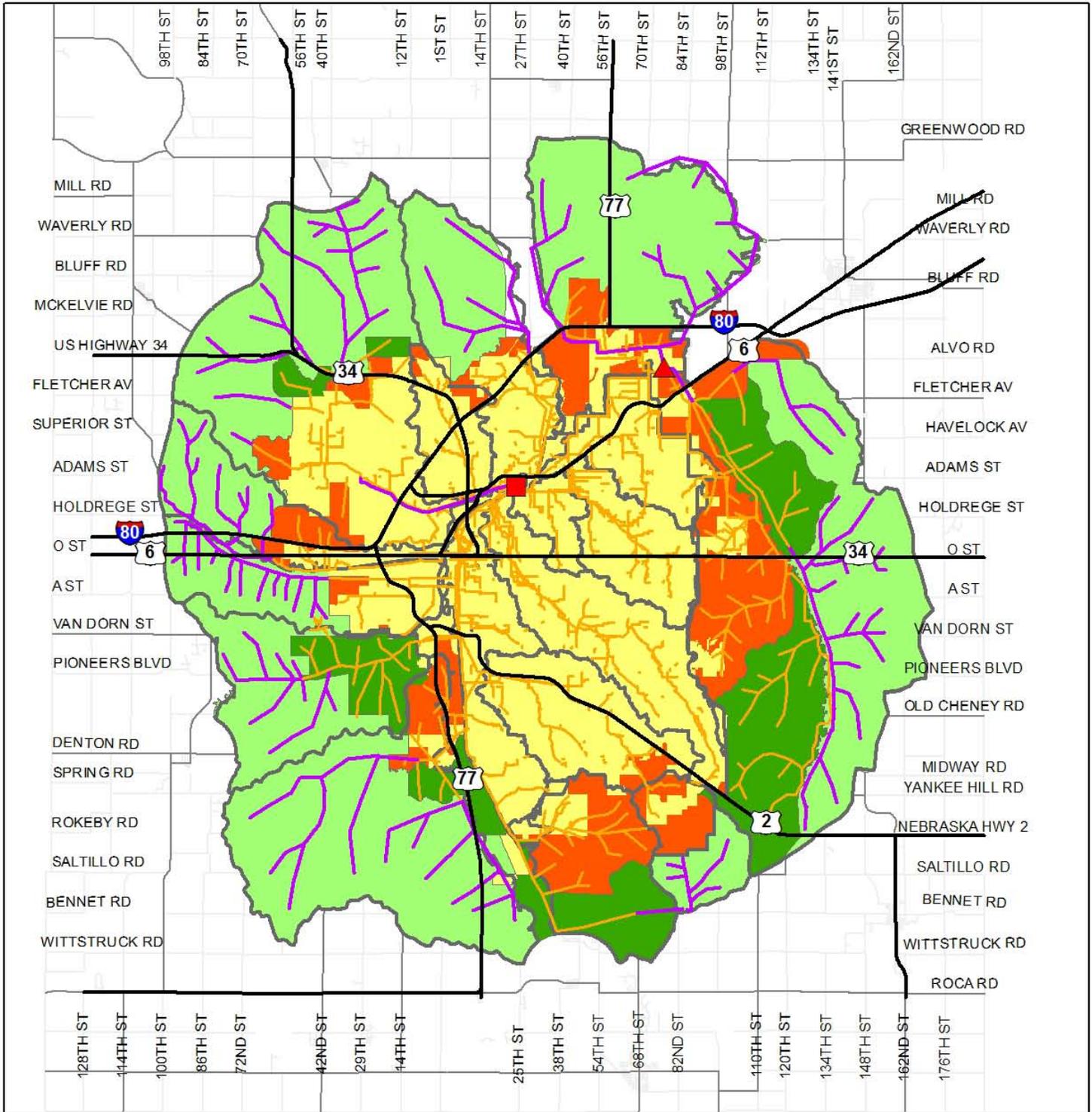
- Theresa St. WWTP **Growth Tiers**
- ▲ Northeast WWTP
- Basin Outlines
- Existing City ⁽¹⁾
- Tier IB and IC
- Tier II **Pipes**
- Tier III
- Tier II
- Existing and Tier I

Notes:

(1) Represents all land within City limits which includes Tier IA.



FIGURE 1.3 – PLANNING AREA TIER II IMPROVEMENTS
 WASTEWATER FACILITIES MASTER PLAN UPDATE – 2014
 CITY OF LINCOLN, NEBRASKA



Legend

- Theresa St. WWTP
- ▲ Northeast WWTP
- Basin Outlines
- Existing City ⁽¹⁾
- Tier IB and IC

- Tier II
- Tier III
- Tier III Pipes
- Existing and Tier I/II

Notes:

(1) Represents all land within City limits which includes Tier IA.



FIGURE 1.4 – PLANNING AREA TIER III IMPROVEMENTS
 WASTEWATER FACILITIES MASTER PLAN UPDATE – 2014
 CITY OF LINCOLN, NEBRASKA

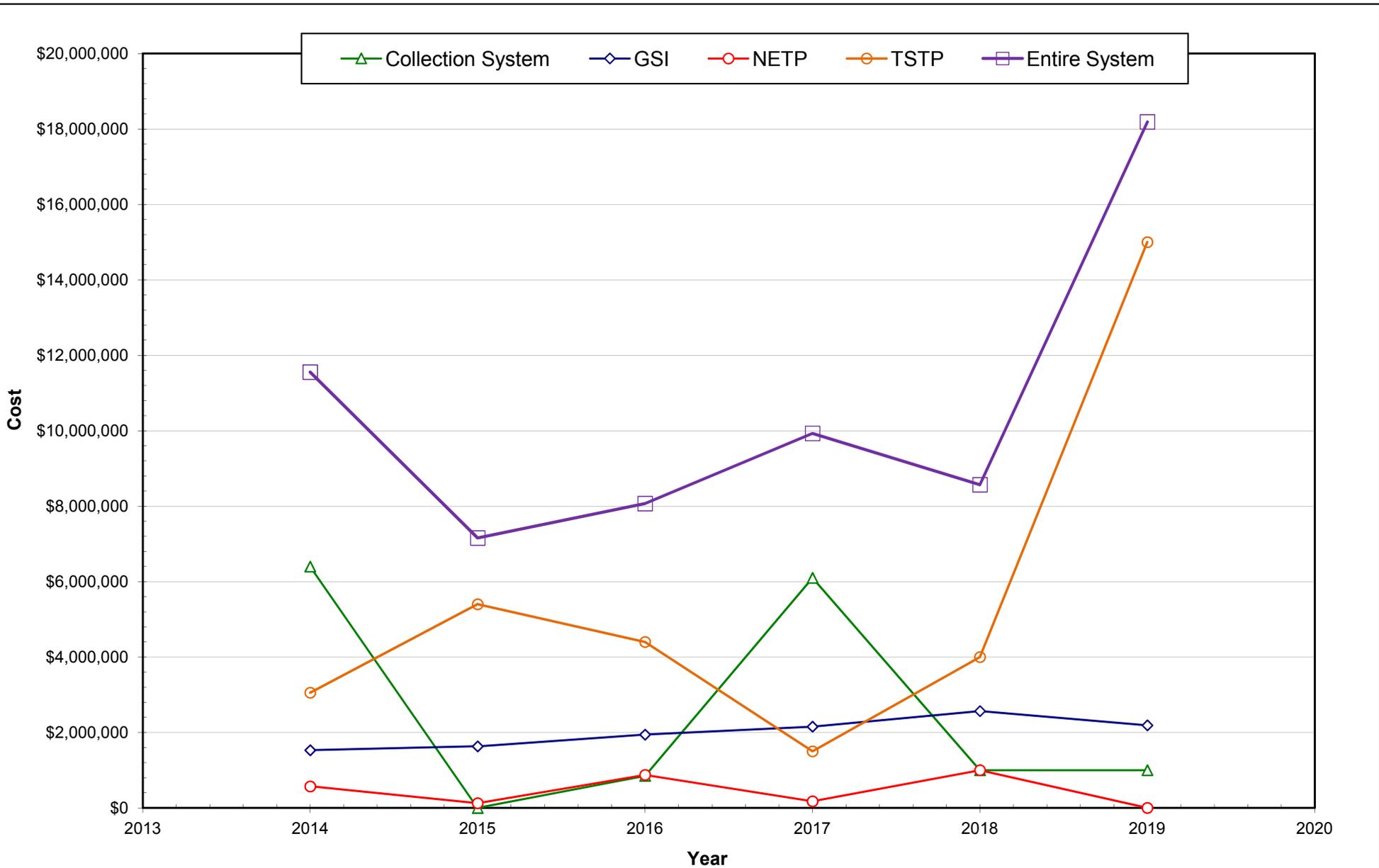


FIGURE 1.5 - ANNUAL COST OF CITY CIP PROJECTS
 WASTEWATER FACILITIES MASTER PLAN UPDATE – 2014
 CITY OF LINCOLN, NEBRASKA

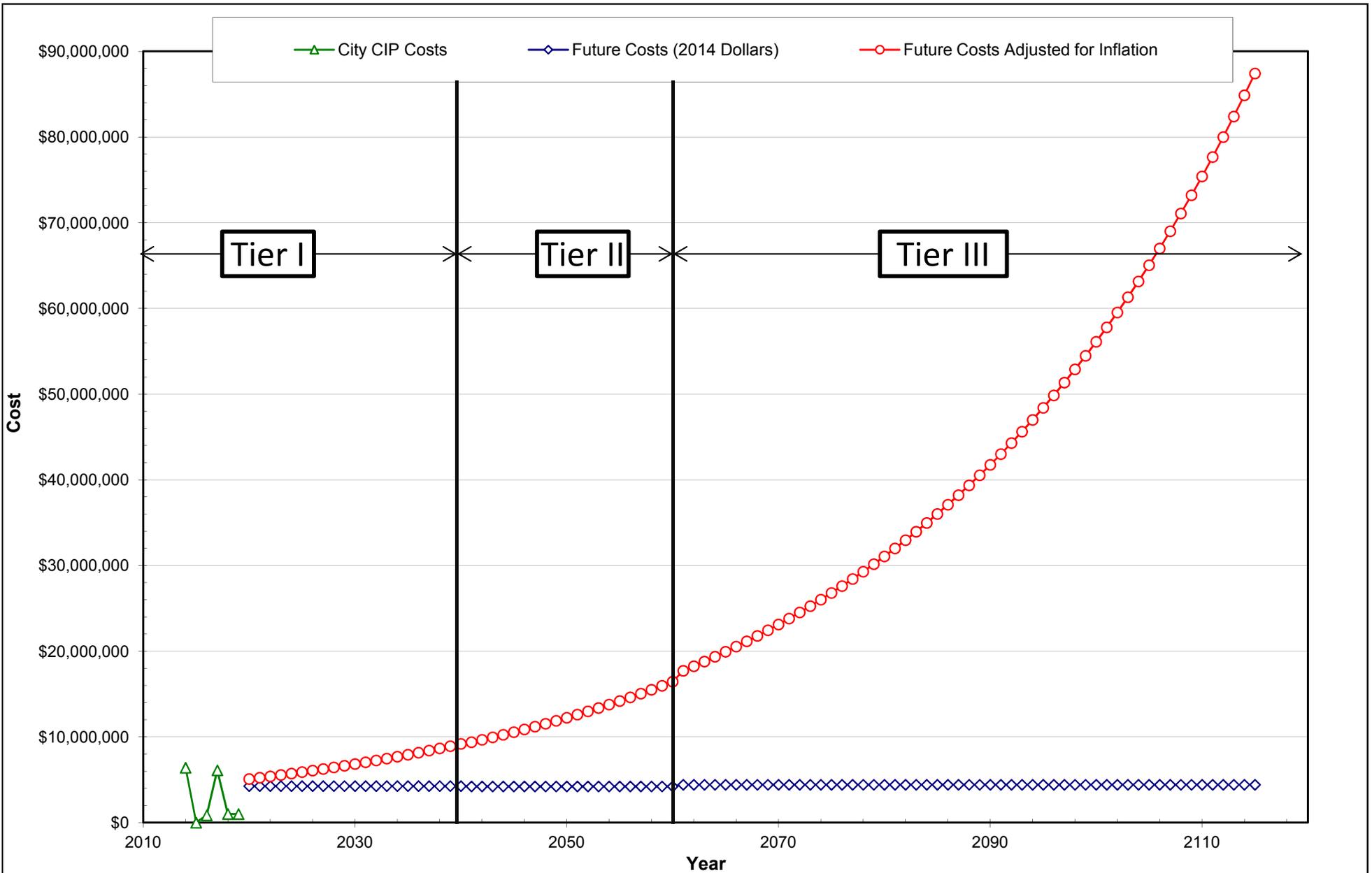


FIGURE 1.6 - ANNUAL COST OF COLLECTION SYSTEM IMPROVEMENT PROJECTS

WASTEWATER FACILITIES MASTER PLAN UPDATE – 2014
CITY OF LINCOLN, NEBRASKA

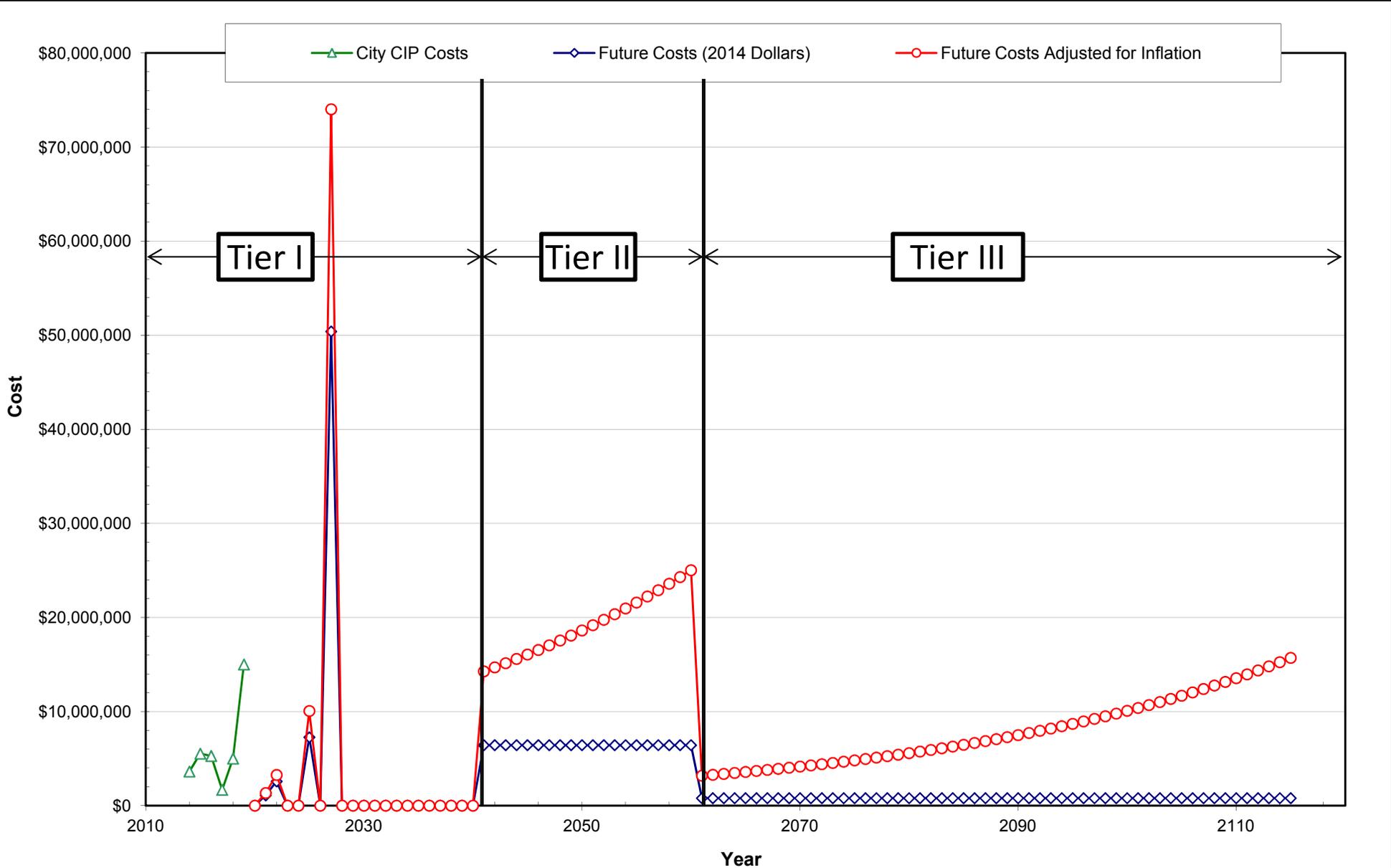


FIGURE 1.7 - ANNUAL COST OF THERESA STREET AND NORTHEAST WWTF IMPROVEMENT PROJECTS
 WASTEWATER FACILITIES MASTER PLAN UPDATE – 2014
 CITY OF LINCOLN, NEBRASKA

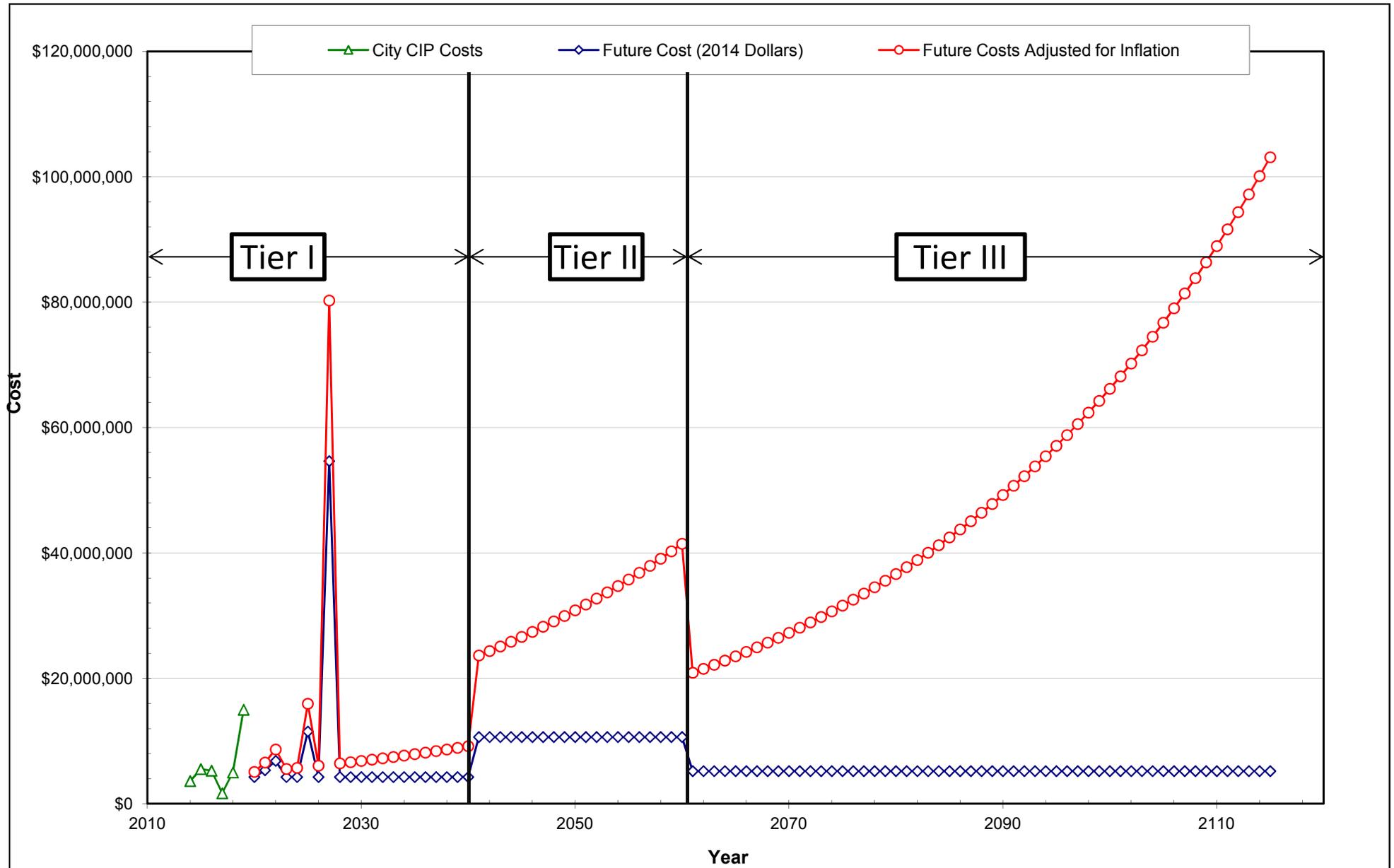


FIGURE 1.8 - ANNUAL COST OF CITY WIDE IMPROVEMENT PROJECTS

WASTEWATER FACILITIES MASTER PLAN UPDATE – 2014
CITY OF LINCOLN, NEBRASKA

Table 1.1 City of Lincoln Existing CIP Summary
Wastewater Facilities Master Plan Update - 2014
City of Lincoln, NE

Type	Project CIP ID	WW CIP ID	Project Title	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
General System Improvement		0173	Wastewater cost of street construction (GSI)	40	41	42	43	44	45	-	-	-	-	-	-	-
		0223	Preliminary Design & Engineering (GSI)	40	41	42	43	44	45	-	-	-	-	-	-	-
		0721	Subsidies(GSI)	50	50	60	70	80	100	-	-	-	-	-	-	-
		0281	Selected repair/repl of WW fac/collectors	1,400	1,500	1,800	2,000	2,000	2,000	-	-	-	-	-	-	-
		0278	Facilities Plan Update (GSI)	-	-	-	-	400	-	-	-	-	-	-	-	-
Subtotals:				1,530	1,632	1,944	2,156	2,568	2,190	0	0	0	0	0	0	0
Collection System		0737	Replace C-6, C-7.C-13 Liftstation Components	80	-	-	-	-	-	-	-	-	-	-	-	-
	700929		Rokey Rd S. 70th to S 84th	1,404	-	-	-	-	-	-	-	-	-	-	-	-
	701069	0558	P Street Liftstation Replacement Ph I (W "O")	1,000	-	-	-	-	-	-	-	-	-	-	-	-
			Sewer N & S of Rokey Road East of 40th St	820	-	-	-	-	-	-	-	-	-	-	-	-
	701068		Subbasin NW43/NW52/N I-80 (Ringneck)	300	-	-	-	-	-	-	-	-	-	-	-	-
	701093		Middle Creek Lift Station (D Street LS)	1,150	-	-	-	-	-	-	-	-	-	-	-	-
	502941		Repl Swr - S Runway, NW 44th & West Mathis	1,644	-	-	-	-	-	-	-	-	-	-	-	-
	502456	0617	Trunk Sewer SW Salt Creek (SW Village) (SV)	-	-	500	5,100	-	-	-	-	-	-	-	-	-
	0619	Repair 48" Sewer Pioneers to "O" St (SV)	-	-	350	1,000	1,000	1,000	-	-	-	-	-	-	-	
Subtotals:				6,398	0	850	6,100	1,000	1,000	0	0	0	0	0	0	0
Teresa Sreet Treatment Plant	701119		Emergency Generator Installation	750	-	-	-	-	-	-	-	-	-	-	-	-
	701427		Headworks/Grit Corr Rehab	125	-	-	-	-	-	-	-	-	-	-	-	-
	502428		Biogas Study	200	-	-	-	-	-	-	-	-	-	-	-	-
		0730	Digester Boiler Installation	600	-	-	-	-	-	-	-	-	-	-	-	-
		0724	Strain Press Replacement & Relocation TSTP	350	-	-	-	-	-	-	-	-	-	-	-	-
		0725	Security Gate at South Entrance TSTP	50	-	-	-	-	-	-	-	-	-	-	-	-
		0723	Bar Screen Replacement TSTP	300	-	1,500	-	-	-	-	-	-	-	-	-	-
	702371	0728	Solids Handling Improvements (Thickening)	500	3,600	1,500	-	-	-	-	-	-	-	-	-	-
		0729	Solids Handling Improvements -Digestion	80	100	600	-	-	-	-	-	-	-	-	-	-
	701131	0561	Influent Pumping Upgrades (TSTP)	100	1,100	-	1,000	-	-	-	-	-	-	-	-	-
	701429	0323	Westside Odor Control Improvements (TSTP)	-	-	500	-	-	-	-	-	-	-	-	-	-
		0727	SCADA/PLC Upgrades	-	300	300	-	-	-	-	-	-	-	-	-	-
	701431	0731	Liquid Dumpstation Improvements	-	-	-	500	-	-	-	-	-	-	-	-	-
			Construct Solids Storage Pad	-	-	-	-	-	-	290	-	-	-	-	-	-
		Wet Weather Treatment	-	-	-	-	-	-	-	2,576	-	-	-	-	-	
		12.6 mgd Central Train expansion	-	-	-	-	-	-	-	-	-	-	-	-	50,400	
	0722	TSTP NPDES Nutrient Removal Study	-	300	-	-	4,000	15,000	-	-	-	-	-	-	-	
Subtotals:				3,055	5,400	4,400	1,500	4,000	15,000	290	2,576	0	0	0	0	50,400
Northeast Treatment Plant	502516		Aeration Blower Installation	0	-	-	-	-	-	-	-	-	-	-	-	-
	702275	0470	Emergency Generator Installation (NETP)	-	-	500	-	-	-	-	-	-	-	-	-	-
		0727	SCADA/PLC Upgrades	500	-	-	-	-	-	-	-	-	-	-	-	-
		0732	NPDES Nutrient Removal Study, design, construct	-	50	200	-	1,000	-	-	-	-	-	-	-	-
		0733	Odor Control Chemical Feed System Replacement	-	75	-	-	-	-	-	-	-	-	-	-	-
		0734	Security Gate at North East	50	-	-	-	-	-	-	-	-	-	-	-	-
		0735	Diversion Gate Replacemnet	20	-	-	-	-	-	-	-	-	-	-	-	-
		0736	Replace Two Raw-wastewater Pumps	-	-	175	175	-	-	-	-	-	-	-	-	-
		-	Solids Dewatering Improvments	-	-	-	-	-	-	800	-	-	-	-	-	-
	-	Replace RDT's	-	-	-	-	-	-	-	-	-	-	5,300	-	-	
	-	Wet Weather Treatment	-	-	-	-	-	-	-	-	-	-	1,969	-	-	
Subtotals:				570	125	875	175	1,000	0	800	0	0	0	7,269	0	0
TOTALS:				11,553	7,157	8,069	9,931	8,568	18,190	1,090	2,576	0	0	7,269	0	50,400

Table 1.2 Summary of Collection System Improvement Costs ⁽¹⁾ Wastewater Facilities Master Plan Update - 2014 City of Lincoln, Nebraska				
Basin	Tier I (2015-2040)	Tier II (2040-2060)	Tier III (2060-2115)	Basin Totals
Salt Valley	\$7,770,000	\$2,000,000	\$4,000,000	\$13,770,000
Antelope Valley	\$0	\$0	\$0	\$0
Beal Slough	\$1,410,000	\$0	\$0	\$1,410,000
Upper Southeast	\$8,962,000	\$4,430,000	\$0	\$13,392,000
Upper Southwest	\$9,710,000	\$4,290,000	\$34,460,000	\$48,460,000
Haines Creek	\$4,370,000	\$12,270,000	\$9,570,000	\$26,210,000
West O St & Middle Creek	\$9,820,000	\$0	\$34,270,000	\$44,090,000
Oak Creek & Lynn Creek	\$5,710,000	\$4,110,000	\$48,000,000	\$57,820,000
Little Salt Creek	\$7,870,000	\$0	\$13,500,000	\$21,370,000
Deadmans Run, East Campus, Havelock	\$0	\$0	\$0	\$0
Northeast Salt Creek	\$9,420,000	\$0	\$47,960,000	\$57,380,000
Stevens Creek	\$39,760,000	\$57,360,000	\$40,680,000	\$137,800,000
Southeast	\$0	\$0	\$10,440,000	\$10,440,000
Totals	\$104,802,000	\$84,460,000	\$242,880,000	\$432,142,000
Notes:				
1. ENR CCI for Kansas City 10,881 (August 2014).				

Table 1.3 Summary of Wastewater Treatment Facility Improvement Costs ^(1,2) Wastewater Facilities Master Plan Update - 2014 City of Lincoln, Nebraska				
Treatment Plant	Tier I (2015-2040)	Tier II (2040-2060)	Tier III (2060-2115)	Plant Total
Theresa Street WWTF	\$86,621,000	\$103,500,000	\$0	\$190,121,000
Northeast WWTF	\$10,814,000	\$25,000,000	\$43,640,000	\$79,454,000
Total	\$97,435,000	\$128,500,000	\$43,640,000	\$269,575,000
<u>Notes:</u>				
1. ENR CCI for Kansas City 10,881 (August 2014).				