
PLANNING CONSIDERATIONS

3.1 GENERAL

A plan to help guide the City of Lincoln's wastewater collection and treatment services to future development areas is a fundamental part of the facilities plan update. The amount of land area needed for development has a general correlation to population. Therefore, it can be assumed that as the City's population increases, a proportional amount of additional land will require wastewater collection and treatment services.

This Facilities Plan Update looks at three planning Tiers or periods, Tier I is a 25 year planning period, beginning in 2005 and ending in 2030, Tier II estimates the needs for the period beginning in 2030 and ending in 2055, and Tier III looks beyond the year 2055. Based on projected population and growth tier land requirements wastewater system improvements will be identified.

3.2 STUDY LIMITS

3.2.1 Geographical Boundaries

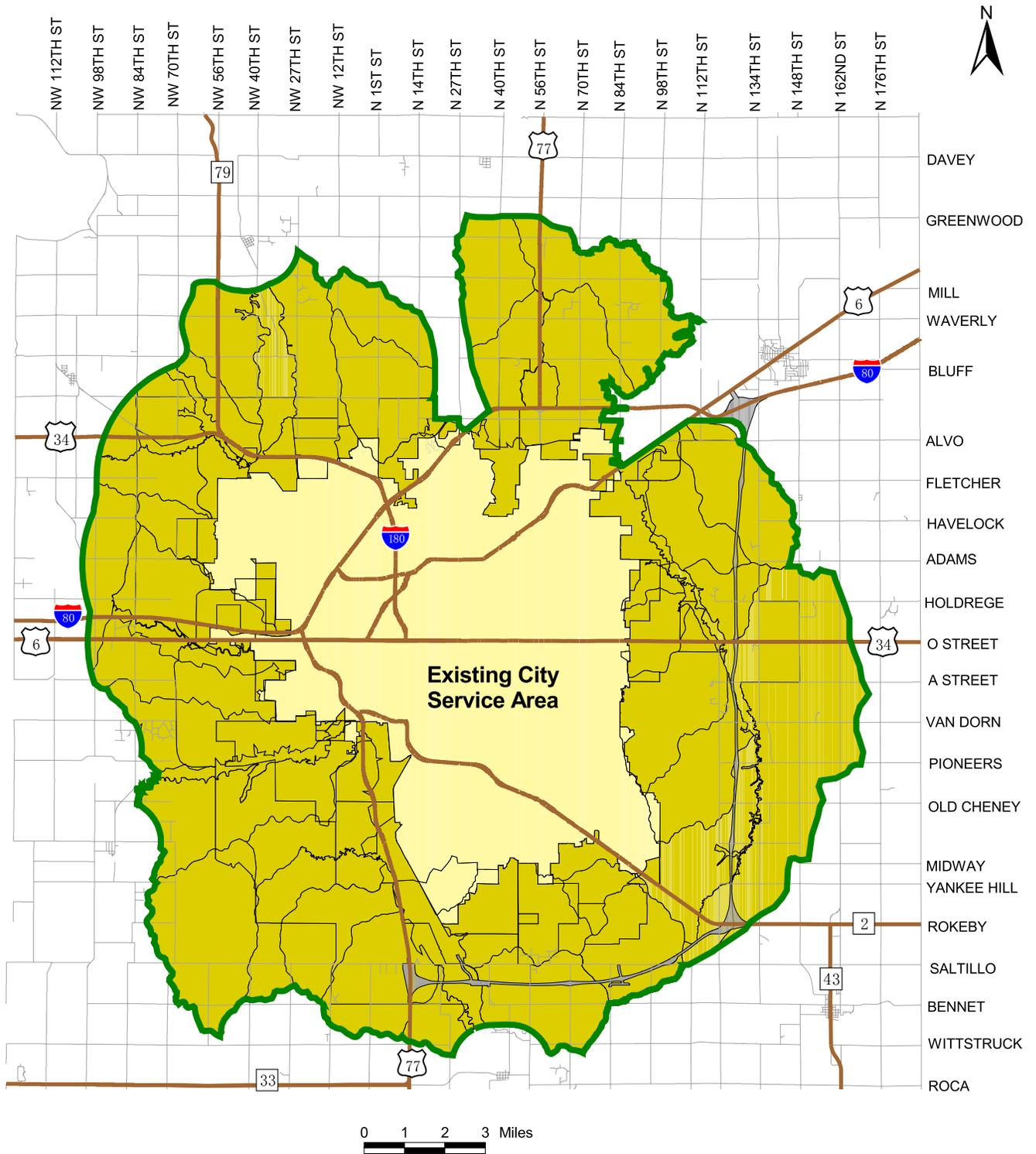
The study area encompasses approximately 290 square miles of land, of which approximately 83 square miles of land are presently served by the City's sanitary sewer system. This area includes the entire City of Lincoln Nebraska as well as areas located within the Lancaster County as shown in Figure 3.1.

3.2.2 Wastewater Drainage Basins

The City of Lincoln's wastewater collection system is currently serving 13 drainage basins, with service in four additional basins planned in the future for a total of 17 basins. These drainage basins are shown in Figure 3.2.

3.2.3 Planning Areas

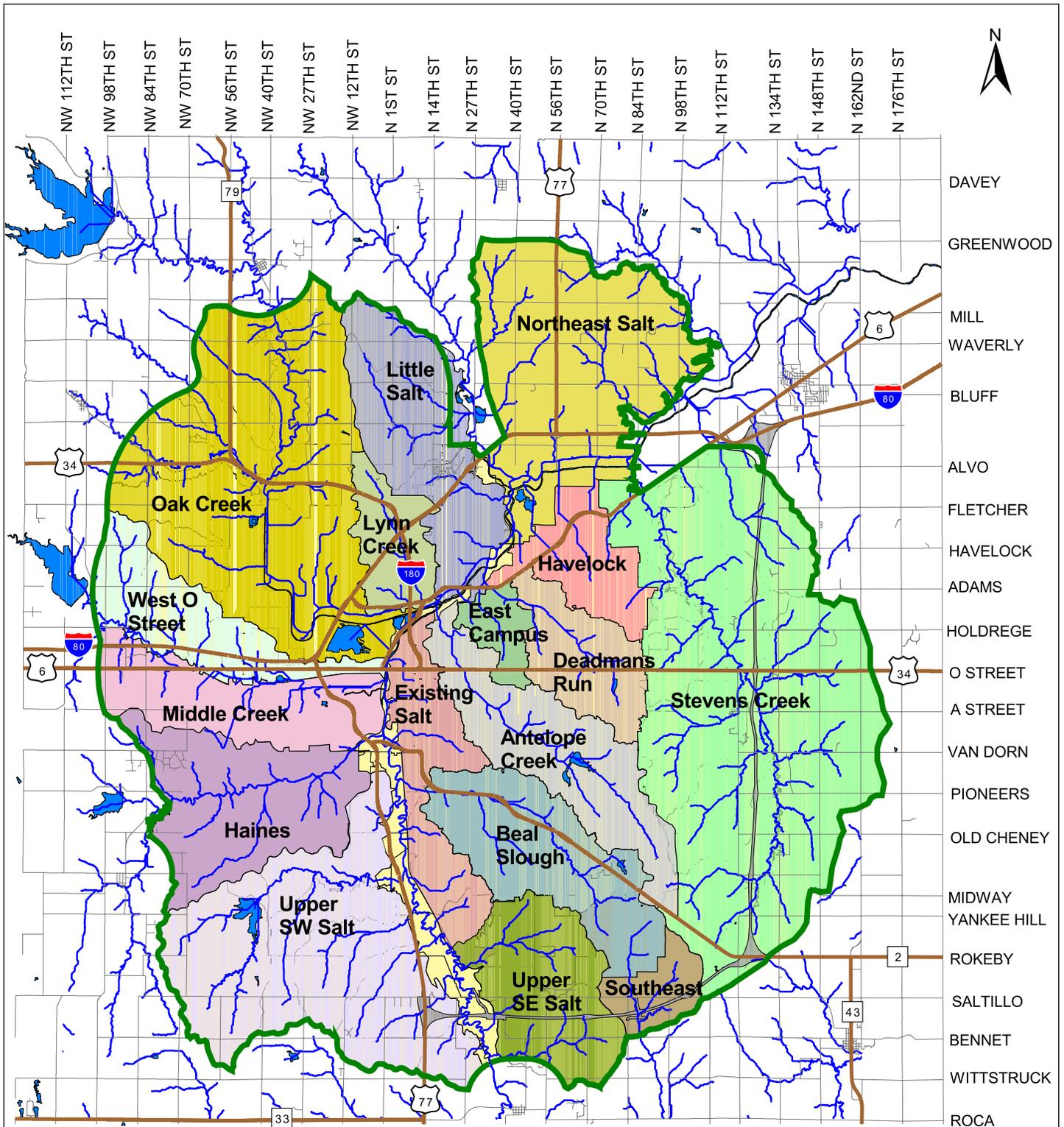
The drainage basins are further delineated by Utility Planning Zones, which are shown in Figure 3.3. The planning zones are further divided by Growth tiers as shown graphically in Figure 3.4.



- LEGEND**
- Study Area Boundary (2030 Comprehensive Plan Tier III Limits)
 - Highways
 - Streets
 - Beltway
 - Existing Service Area
 - Tier Growth Area



Figure 3.1 Project Study Area
Wastewater Facilities Master Plan Update - 2007
City of Lincoln, Nebraska

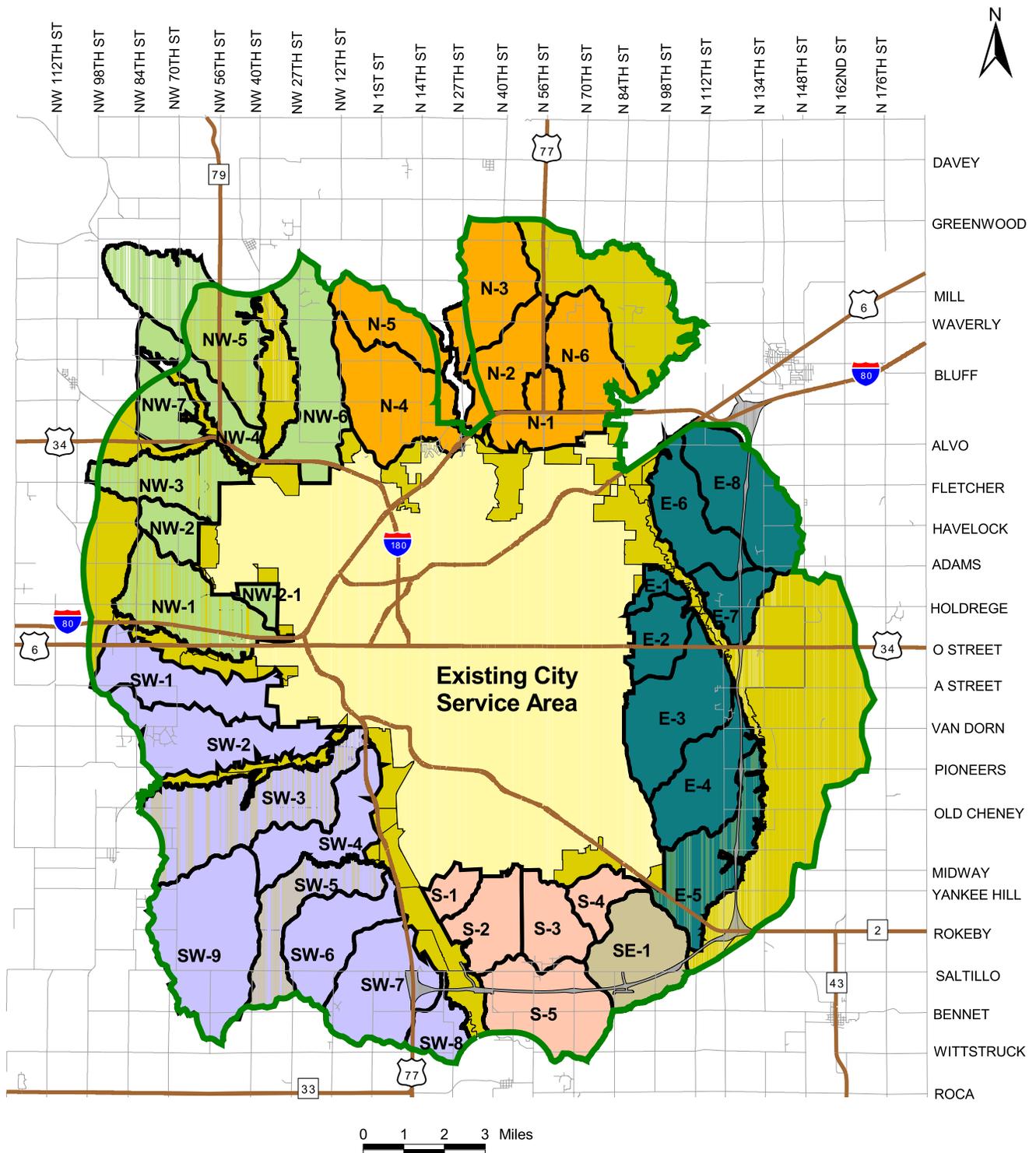


LEGEND

-  Study Area Boundary (2030 Comprehensive Plan Tier III Limits)
-  Highways
-  Streets
-  Streams and Lakes
-  Beltway



Figure 3.2 Drainage Basins
Wastewater Facilities Master Plan Update - 2007
City of Lincoln, Nebraska

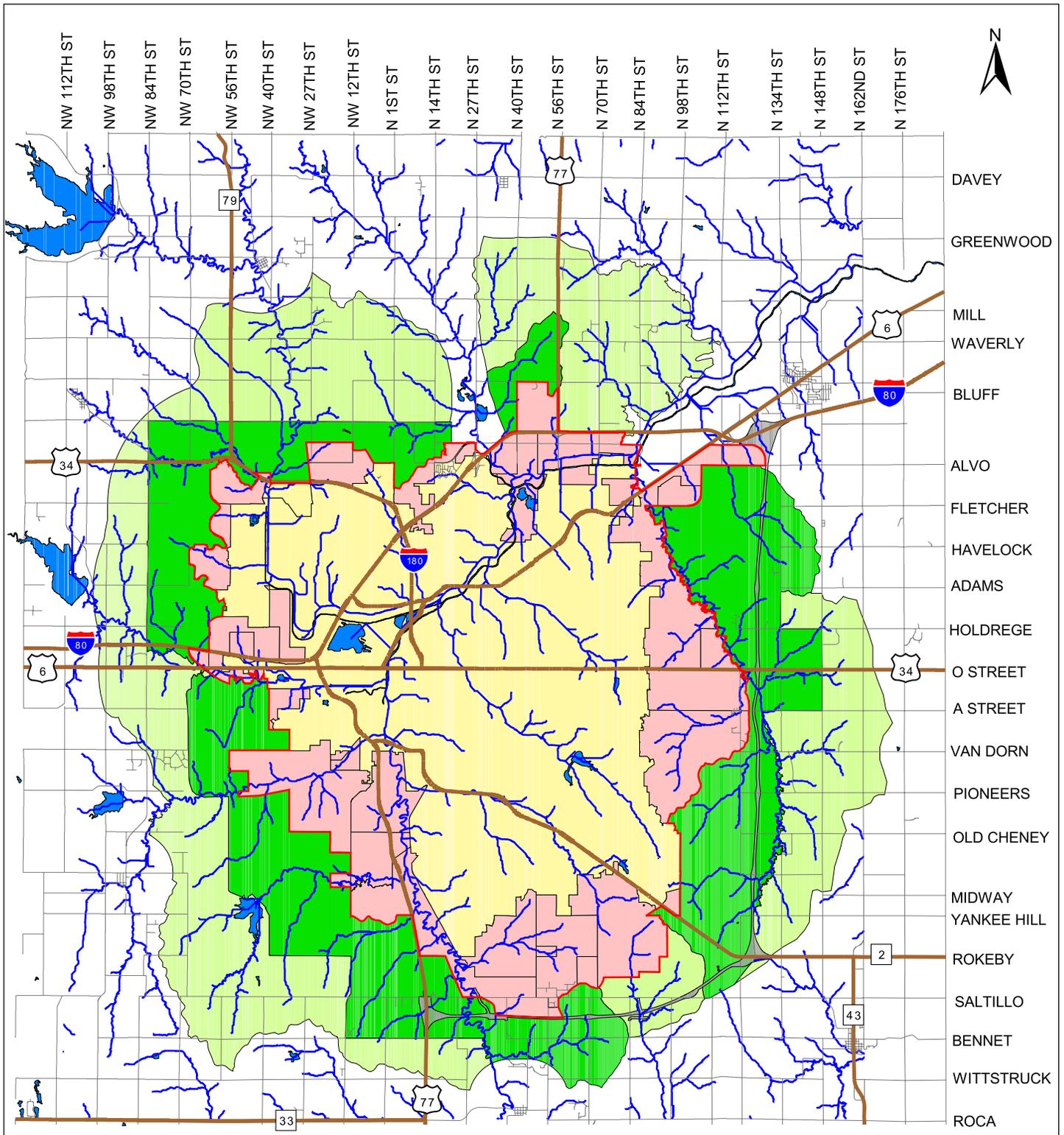


LEGEND

- Study Area Boundary (2030 Comprehensive Plan Tier III Limits)
- Highways
- Streets
- Beltway
- Utility Planning Zones**
- North Zones
- Northwest Zones
- Southwest Zones
- South Zones
- Southeast Zone
- East Zones
- Existing Service Area
- Tier Growth Area



Figure 3.3 Utility Planning Zones
Wastewater Facilities Master Plan Update - 2007
City of Lincoln, Nebraska



LEGEND

- Future Service Limit
- Highways
- Streets
- ^ Streams
- Beltway
- Growth Tiers**
- Existing Service Area
- Tier I
- Tier II
- Tier III

0 1 2 3 Miles



Figure 3.4 Planning Growth Tiers
Wastewater Facilities Master Plan Update - 2007
City of Lincoln, Nebraska

3.2.4 100 Year Floodplain Areas

There are several creeks and waterways that are located within the City and Study Area boundaries. Shown in Figure 3.5 are the 100-year floodplains associated with these waterways. The City of Lincoln has enacted a floodplain management program, which restricts growth within the 100-year floodplain. This was accomplished by creating ordinances that prohibit the subdivision of land parcels or platting within the 100-year floodplain unless certain restrictive conditions are met. Zoning ordinances also prohibit encroachments in the floodway and impose certain construction requirements in the floodway fringe. The City has given jurisdictional authority to the Building and Safety Department to enforce these ordinances. Based on these regulations, it is anticipated that development within the 100-year floodplain will be minimal in the foreseeable future.

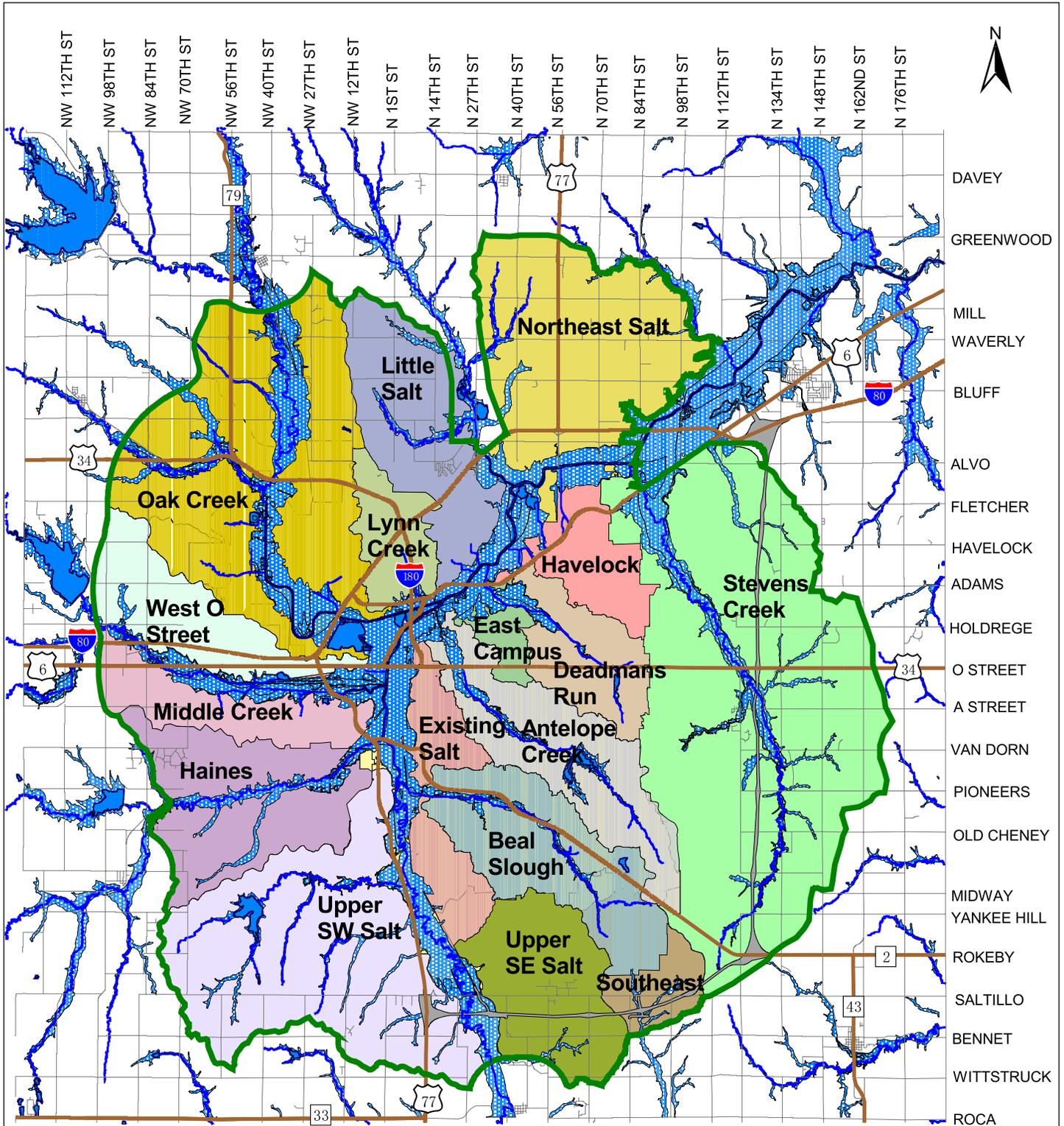
3.3 PLANNING AGENCIES

The Wastewater Facilities Master Plan Update will be used by many different groups within the City, and certain agencies outside the City, to formulate plans to manage growth in the Lincoln area. To that end, a concerted effort was made to keep the City Planning Department involved and informed during the preparation of this update.

3.4 EXISTING LAND USAGE

The City of Lincoln and Lancaster County are using the 2030 Comprehensive Plan to guide their planning and land use activities. The land use plans reflect an approach to addressing the following basic concerns of the community:

1. Continues development of downtown as the heart of the community, a center of employment, culture, entertainment, and government.
2. Development of a compact and generally contiguous urban form for the City of Lincoln.
3. Development of a roadway network around the perimeter of the City of Lincoln.
4. Development of infrastructure such as roads, water, sewer, parks, stormwater, schools, libraries, and open space concurrent with land development.
5. Development of detailed sub-area plans for developing areas of the City, the urban environment, and the rural environment.



- LEGEND**
- Study Area Boundary (2030 Comprehensive Plan Tier III Limits)
 - Highways-all-updated.shp
 - Streets
 - Streams
 - Beltway
 - 100-Year Floodplain



Figure 3.5 100-Year Floodplain
Wastewater Facilities Master Plan Update - 2007
City of Lincoln, Nebraska

6. Development of a close relationship between the Comprehensive Plan, land use regulations, and the Capital Improvement Program.
7. Development of multiple public use corridor for trails, parks, stormwater drainage, utilities, etc.
8. Consideration of the natural and man made environments in all development actions.

The existing and future land use plans within the City of Lincoln will direct growth to specific drainage basins to ensure orderly expansion and to control expenditures for wastewater infrastructure improvements. The plans acknowledge that Lincoln's existing neighborhoods are important resources that must be protected and, if necessary revitalized. The plans seek to maximize benefits from land already within the urban area through infill development on underutilized sites. These strategies emphasize reliance on maximum feasible utilization of existing public facilities including roadways, utilities, schools, and libraries before constructing new public facilities in other locations. In some instances, rebuilding or expanding deficient facilities within the existing urban area will be necessary.

3.5 FUTURE LAND USE

As the City's population has grown historically, new land areas have been developed to accommodate the growth. The Comprehensive Plan outlines the anticipated land use on these new development areas. Therefore, wastewater planning decisions should incorporate enough flexibility to accommodate possible variations in future growth conditions within the City. The Comprehensive Plan addressed growth in detail and provides specific direction for planned growth and should be referenced for further information relating to this issue.

3.6 POPULATION

The following section presents historical and projected population data used to evaluate the growth trend in the City of Lincoln and Lancaster County area for consideration in design.

3.6.1 Historical Population

Historical population data, as listed by the U.S Bureau of Census, is presented in Table 3.1 below for both the City of Lincoln and Lancaster County.

Table 3.1 Historical Population From 1880 to 1980 ⁽¹⁾ Wastewater Facilities Master Plan Update - 2007 City of Lincoln, Nebraska				
Year	City of Lincoln		Lancaster County	
	Population	Annual Change (%)	Population	Annual Change (%)
1880	13,003			
1890	55,154	15.5		
1900	40,169	-2.7		
1910	43,973	0.9	73,793	
1920	54,948	2.5	85,902	1.6
1930	75,933	3.8	100,324	1.7
1940	81,984	0.8	100,585	0.0
1950	98,884	2.1	119,742	1.9
1960	128,521	3.0	155,272	3.0
1970	149,518	1.6	167,972	0.8
1980	171,932	1.5	192,884	1.5
1990	191,972	1.2	213,461	1.1
2000	225,581	1.8	250,291	1.7
2005	243,015	1.5	269,634	1.5

Notes:
1. Population data from 2030 Lincoln/Lancaster County Comprehensive Plan.

Table 3.1 illustrates how population increases varied greatly for the City of Lincoln in historical years, from a large increase, greater than 15% in the 1890's, to a decline in 1900's. However, the more recent historical growth for the City of Lincoln and Lancaster County appears more consistent at an average increase of around 1.5%.

3.6.2 Projected Population

Due to the expected service life of 50 plus years for collection system components it is advantageous to project population growth for a 50-year planning period. This Facility Plan Update estimates future wastewater utility needs for both 25 and 50 (plus) year planning horizons. It is anticipated that the population will continue to grow at a steady rate throughout the future years. The 2030 Lincoln/Lancaster County Comprehensive Plan is based on an assumed 1.5% annual population growth rate. For the purposes of this study, the 1.5% growth rate was used for the 50-year period of the Wastewater Master Plan Update.

The 25-year planning period is synonymous with the Tier I growth. Table 3.2 shows that with an annual growth rate of 1.5%, the population at the end of the Tier I growth or 25 years will be approximately 352,601 or an increase of about 110,000. Likewise, the City population is projected to be 511,605 people at the end of the 50 year or Tier II planning period. Figure 3.6 illustrates both the historical and projected growth trend for the City of Lincoln and Lancaster County.

Table 3.2 Population Projections from 2005 to 2060 ⁽¹⁾ Wastewater Facilities Master Plan Update - 2007 City of Lincoln, Nebraska		
Year	City of Lincoln	Lancaster County
	Population	Population
2005 ⁽²⁾	243,015	269,634
2010	261,796	290,473
2015	282,029	312,922
2020	303,825	337,106
2025	327,306	363,159
2030	352,601	391,225
2035	379,852	421,460
2040	409,208	454,032
2045	440,833	489,122
2050	474,903	526,923
2055	511,605	567,646
2060	551,144	611,516

Notes:

1. Population projections adopted from 2030 Lincoln/Lancaster County Comprehensive Plan, at an annual growth rate of 1.5 percent.
2. 2005 population from U.S. Census estimate.

3.6.3 Comparison of Land Inventory to Projected Population

The area of new land developed to pace the projected population growth is outlined in Table 3.3 below. This area is compared to the amount of land identified in each growth tier. As outlined in Table 3.3, and shown graphically in Figure 3.7, there is more land available for development in the current growth tier than would be consumed by the projected population, at the parameters noted.

Table 3.3 Acreage Calculations Based on Population Wastewater Facilities Master Plan Update - 2007 City of Lincoln, Nebraska				
Year	Population ⁽¹⁾	Area Based on Projected Population Acres ⁽²⁾	Area Identified in the Current Growth Tiers Acres ⁽³⁾	Percent Difference
2005 - Existing	243,015	33,752	48,935	45.0%
2030 - Tier I	352,601	48,972	77,409	58.1%
2055 - Tier II	511,605	71,056	121,285	70.7%
2105 - Tier III	1,077,053	149,591	172,410	15.3%
Notes:				
1. Population projections adopted from 2030 Lincoln/Lancaster County Comprehensive Plan, at an annual growth rate of 1.5 percent.				
2. Based on 3 units per acre and 2.4 people per unit = 7.2 people per acre and projected population numbers. Values from Lincoln Planning Department.				
3. Acres from Lincoln Planning Department.				

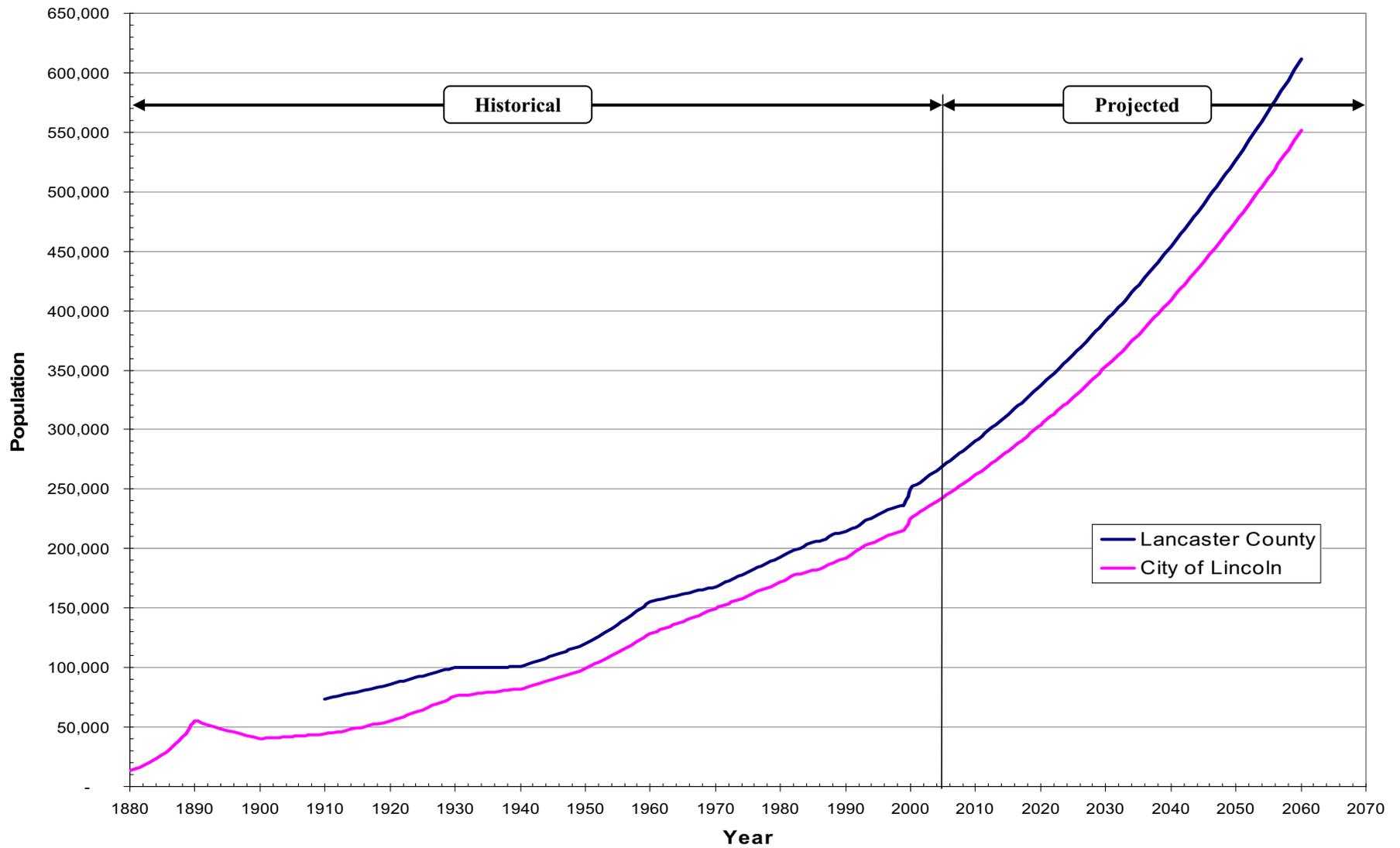
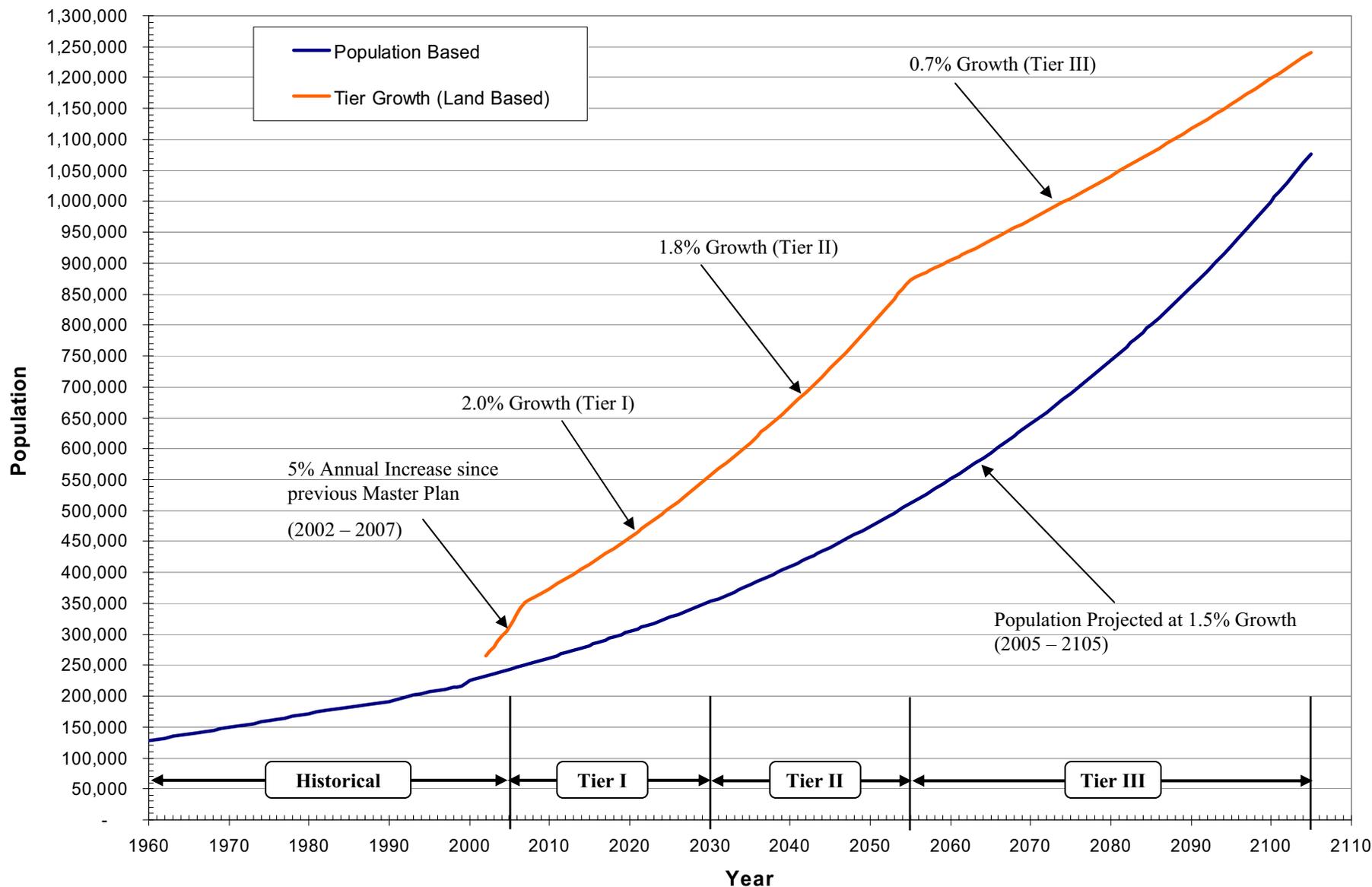


Figure 3.6

Historic and Projected Population Trends for City of Lincoln and Lancaster County
 Wastewater Facilities Master Plan Update - 2007
 City of Lincoln, Nebraska





Notes:

1. Tier Growth (land based) per Planning Department from 2007 to 2105. Acres are converted to population using 7.2 persons per acre and annualized land growth between Tiers.
2. Population growth is annualized percentage.



Figure 3.7

Comparison of Historic and Projected Population Based on Population Projected Growth and Tier Projected Growth Wastewater Facilities Master Plan Update - 2007 City of Lincoln, Nebraska