



City of Eagle Lake
Comprehensive Infrastructure Planning Study
March 2006

Section 1 – Introduction and Growth Projections



TABLE OF CONTENTS

1.0 Purpose of Report 1
2.0 Scope of Study 3
3.0 Report Organization..... 4
4.0 Population Projections 4
5.0 Household Projections 6
6.0 Development Projections 9

FIGURES

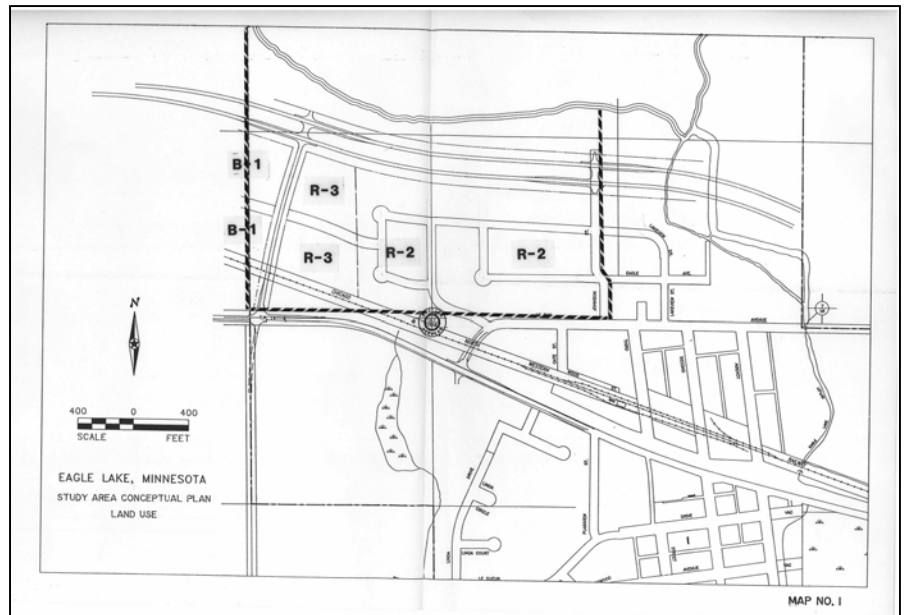
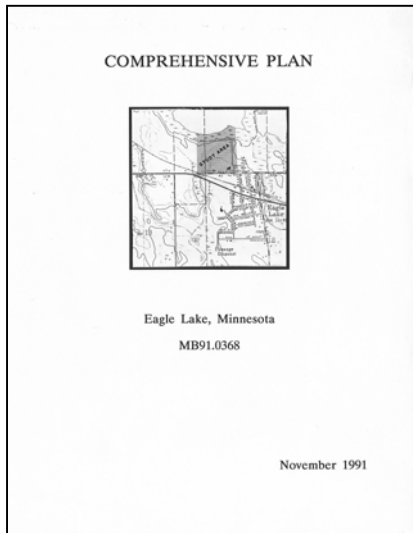
Figure 1.0: Land Use Plan 3
Figure 2.1: Land Use Assumptions 3
Figure 4.1: Comparison of Population Change by % 5
Figure 4.2: Population Projection 6
Figure 5.1: Household Projections Based Upon Population Projection 8
Figure 5.1: Existing and Future Developments 9

TABLES

Table 4.1: Population Change – 1970 to 2000 4
Table 5.1: Household & Housing Unit Change 7
Table 6.1: Existing and Future Developments 9
Table 6.2: Estimated Ultimate Population Based on Land Use Plan 10



In 1991, the City prepared a Comprehensive Infrastructure Plan to address potential development in the northwest portion of the City in conjunction with the T.H. 14 expansion.



In 1994, the City prepared a Water Supply System evaluation to determine the need for water supply and storage improvements.

A quick comparison of the maps shown above and the current City street map reveal that planning for future development is not an exact science. While it is apparent that the street layouts shown on these maps were not implemented as shown, several of the utility improvements recommended in the 1991 Comprehensive Infrastructure Plan and the 1994 Water Supply System evaluation have been implemented. For example, in 1995 the City constructed a new elevated water storage tank based on the 1994 study recommendations. In 1998, several of the utility sizing recommendations included in the 1991 and 1994 studies were implemented as a part of the LeRay Avenue (CSAH 55) reconstruction project.

Therefore, while a comprehensive plan cannot be expected to accurately predict the future, it can be a valuable reference and planning guide for a City during periods of growth.



2.0 Scope of Study

This report includes an analysis of the needs for expanded infrastructure within the growth area for the City of Eagle Lake, which is identified in the Land Use Plan shown on Figure 1.0. The Land Use Plan was developed by City staff and adopted by the City Council in April of 2006. The limits of the Land Use Plan represent what may be a 60 to 100 year growth area for the City, depending on the rate of growth. For the purposes of this report, we will refer to the limits of the Land Use plan as the “ultimate growth area.” This does not mean that the City will not eventually grow beyond these limits; it simply means that study beyond these limits is not feasible at this time.

The infrastructure elements that will be included in the study are as follows:

- Transportation system
- Water supply, storage, an distribution
- Wastewater collection and pumping capacity
- Storm sewers and storm water management

The infrastructure needs for developing areas are highly dependent on the type of land use (residential, commercial, industrial, etc.) that will ultimately take place. The City’s Land Use Plan includes an agricultural area on the fringe of the study area. For the purposes of this infrastructure study, it is necessary to make assumptions regarding the future land use in this agricultural area. Figure 2.1 shows the future land use assumptions for this agricultural fringe area. These land use assumptions were utilized to establish infrastructure design parameters such as projected traffic generation, projected wastewater generation, and projected water demands within the study areas.

In providing municipal utility services, it is necessary to have a planning horizon that is long enough to enable systematic implementation of improvements, maintain service capability equal to or greater than demand, and to effectively use capital and physical facilities. Generally a 20-year planning horizon best meets these needs. While this study will evaluate infrastructure needs for the ultimate growth area, it will focus more heavily on the needs that may occur within a 20-yr period.



3.0 Report Organization

To adequately address the various infrastructure elements that are evaluated in this study, this report is organized into six sections as shown below:

- Section 1 – Introduction and Growth Projections
- Section 2 – Transportation System
- Section 3 – Water System Plan
- Section 4 – Wastewater System Plan
- Section 5 - Storm Water Management Plan
- Section 6 - Financing Alternatives

4.0 Population Projections

The City of Eagle Lake has experienced steady growth over the past 30 years. Table 4.1 shows the US Census population for Eagle Lake as compared to surrounding communities and Blue Earth County.

Table 4.1
Population Change - 1970 to 2000

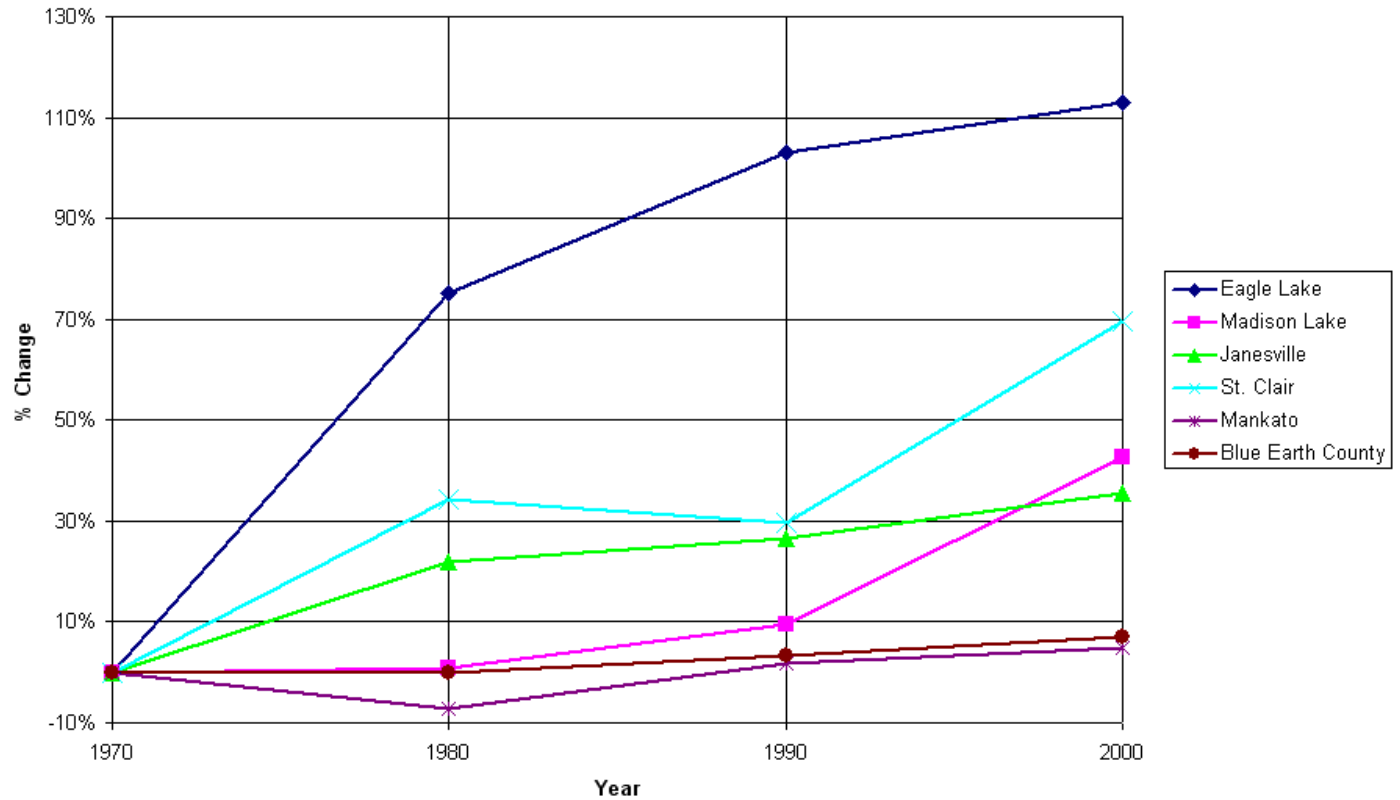
	1970	1980	1990	2000
Eagle Lake	839	1,471	1,703	1,787
Madison Lake	587	592	643	837
Janesville	1,557	1,897	1,969	2,109
St. Clair	488	655	633	827
Mankato	30,895	28,642	31,468	32,427
Blue Earth County	52,322	52,314	54,044	55,941

Source: US Census 1970 to 2000

Figure 4.1 below shows a comparison of population change by percentage for these communities and the County.



Figure 4.1
Comparison of Population Changes by %



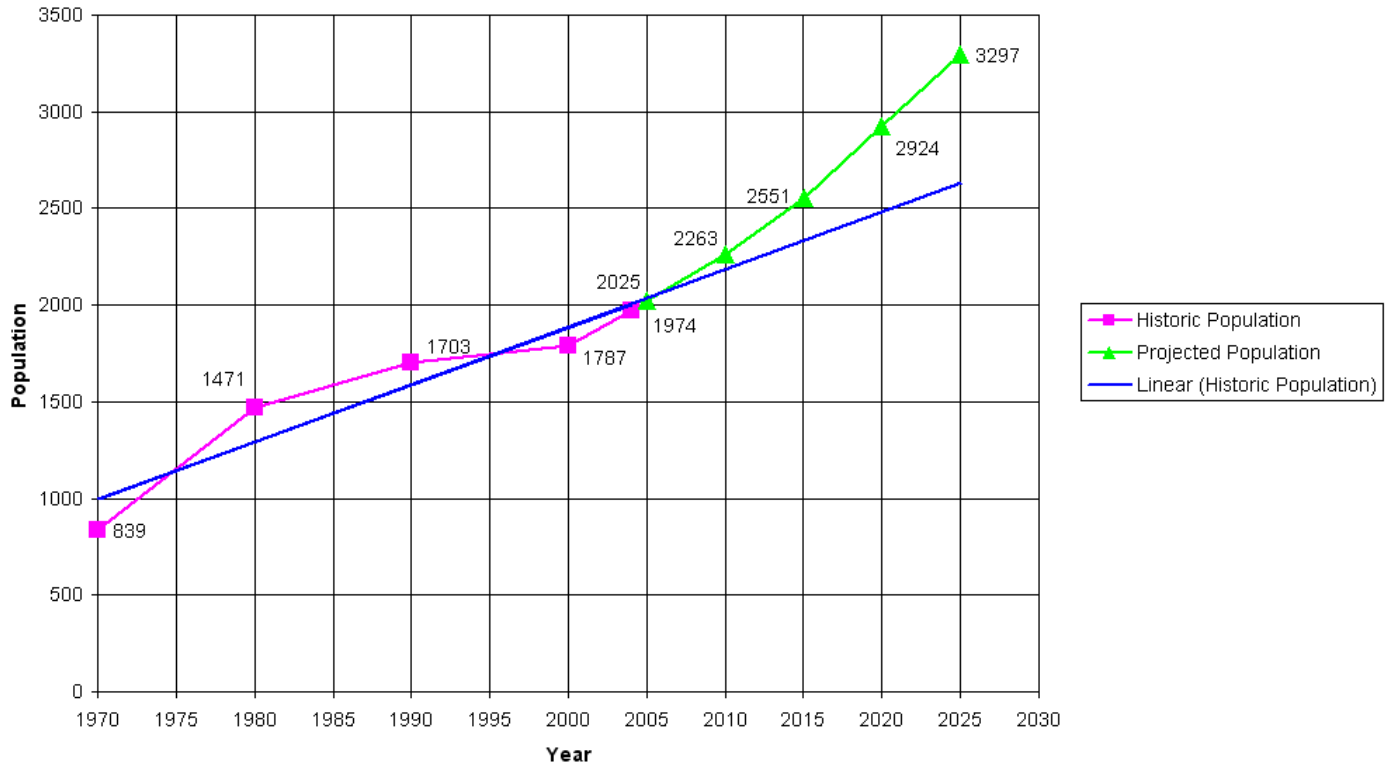
As the figure shows, Eagle Lake had a higher growth rate than the surrounding communities and the County between 1970 and 1990. Between 1990 and 2000, Eagle Lake's growth rate flattened a bit, but still remained higher than the County's growth rate. Madison Lake and St. Clair had an increase in growth rate between 1990 and 2000, while Mankato and Janesville's growth rate remained similar to the County's rate.

Population projections are an important part of any comprehensive planning effort. Projections involve the use of historical data to make estimates of what might happen in the future. Since historical trends are not always an accurate predictor of the future, population projections rarely prove to be completely accurate. However, it is necessary to attempt to estimate the growth in population during the planning period in order to predict development timelines. The population projections will also be used to project future domestic water consumption and wastewater generation.



The population projection shown in Figure 4.2 was approved by the City Council on October 3, 2005. It represents a projected growth of approximately 29% per decade, which is the average per decade growth rate for the City from 1970 to 2000.

Figure 4.2 - Population Projection



This population projection will be used throughout this study for the purposes of projecting water consumption and wastewater flow rates.

5.0 Household Projections

During the past 20 to 30 years, it has been observed that the growth in households is greater than population growth. The composition of households is changing as well. There are fewer households composed of the traditional married couple with children. A decline also occurred in the percentage of households with a married couple but with no children present. Increases have been seen in the number of single parent households. In addition, there has been significant growth in non-family households. Table 5.1 illustrates this shift.



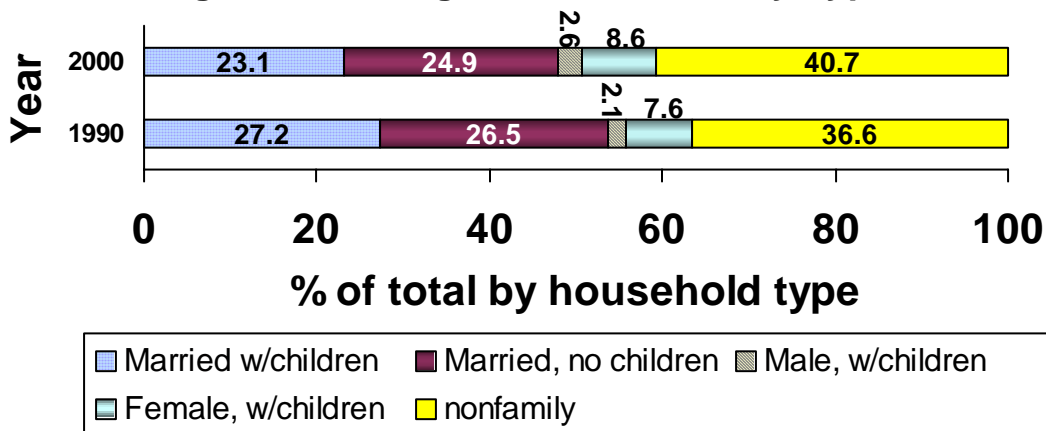
Table 5.1
Household & Housing Unit Change

Year	1970	1980	1990	2000
Population	839	1470	1703	1787
Number of Households		485	576	663
Persons per Household		3.03	2.96	2.75
Number of Housing Units	239	517	588	663

Source: U.S. Census: 1970 to 2000

Projections made by the State Demographer’s office anticipate declines in those households with a married couple with children, slight declines in households with a married couple and no children, a stabilization of single parent households with children, and continued increases in the non-family types of households. The household changes being seen are due to increases in divorce rates, delayed marriages, and longer life spans.

Figure 2-3 Changes to Household by Type

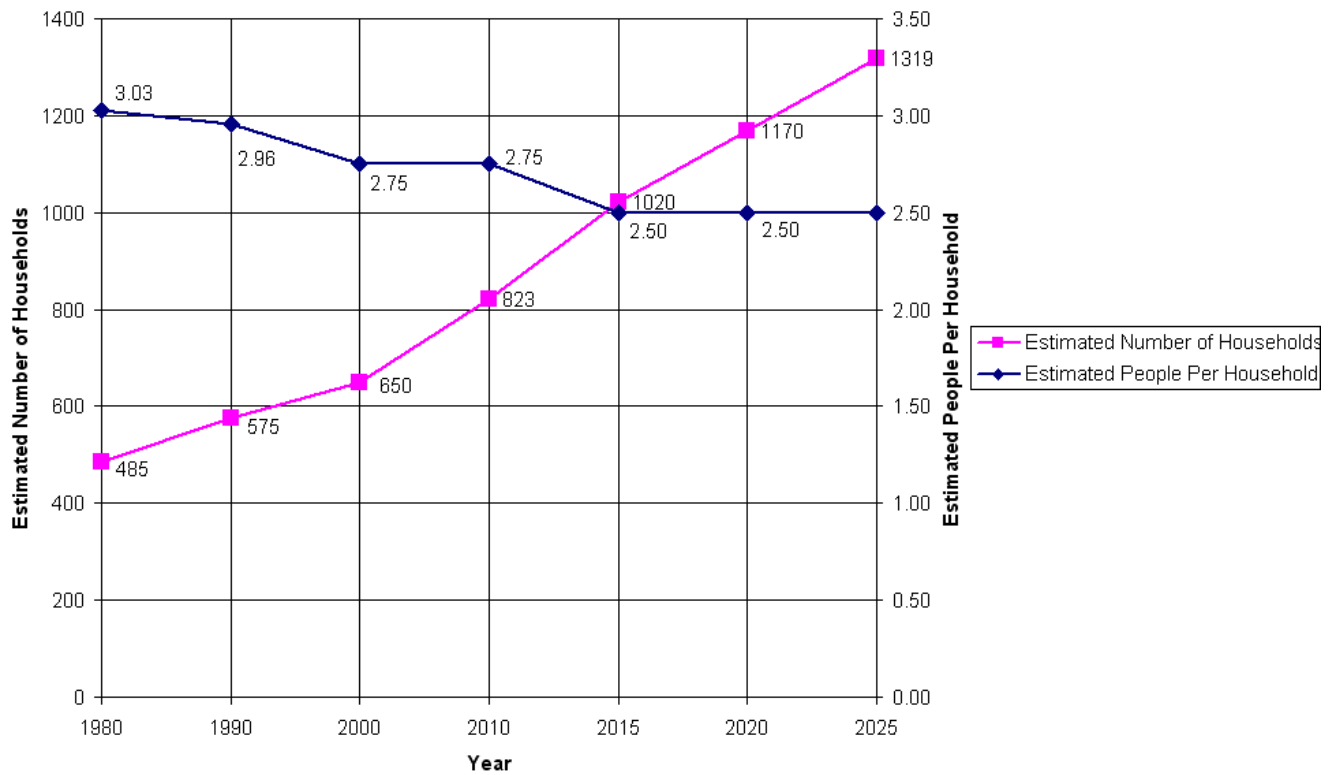


These kinds of population trends all impact household sizes and household numbers. This is important because it impacts land use and housing needs. Even with little to no growth in an area's population, a change in the composition of households can impact housing demand. When elderly persons stay longer in their homes, housing turnover becomes stifled. Therefore, new families who would like to locate to an area in which few homes are for sale either locate elsewhere or look for new building sites.



Figure 5.1 shows the change in the number of estimated households, based upon the population projections illustrated earlier.

Figure 5.1 - Household Projections Based Upon Population Projection



An assumption is made that the average household size will continue to decrease through the year 2025. Each population projection estimate was divided by the estimated average household size. The assumptions are as follows, the average household size of 2.75 persons per household was used for the year 2010, and 2.5 persons for the year 2015, and 2.5 persons for 2025. These estimates are based upon assumptions made by the State Demographer for Blue Earth County.

The household estimates were then applied to the population projections provided above, producing an estimate regarding the potential demand for housing in the city. As seen in Figure 1.3, the housing demand to the year 2025 is estimated to average approximately 27 units per year. Energy costs, development patterns in the city, the costs of building single family homes, interest rates, family dynamics, and a variety of other factors all will have an impact upon this development trend.



6.0 Development Projections

The City of Eagle Lake has several newly completed subdivisions with lots available, as well as recently platted subdivision areas with improvements scheduled for 2006. There are also two areas that have been presented to the City for development as concept plans. These areas are shown in Figure 6.1. Table 6.1 shows the estimated number of lots that are currently or will be available in these subdivisions.

Table 6.1 – Existing and Future Developments	
Subdivision Name	Estimated Lots
Platted and Currently Selling Lots	
Prairie Run	50
Eagle Ridge No. 1	20
Greenfield No. 1	10
Greenfield No. 2	25
Total	105
Plats Approved and Awaiting Infrastructure Improvements (Expected Completion in 2006)	
Eagle Ridge No. 2	88
Eagle Ridge No. 3	42
Eagle Heights Phase 1	87
Total	217
Concept Plans	
Eagle Heights Future Phases	297
Coves of Eagle Lake	400
Total	697

As shown in Table 6.1, at the end of 2006, there will be approximately 280 lots available in the City of Eagle Lake. As discussed in Section 5.0, based on the accepted population projection, the City can expect an average of 27 units per year. Therefore, at the end of 2006, there will be a 12-year supply of lots available. The remaining subdivisions currently shown in concept total 739 lots, which is an additional 26-year supply.



Many factors combine to determine which areas will develop quickly and which will not. Such factors include:

- Property ownership and development philosophy of property owners.
- Access considerations.
- Natural physical features such as topography, soils, and presence of wetlands.
- Proximity to existing infrastructure systems.

Although it is impossible to predict exactly where development will occur within the next 20-years, Given the size of the developments that are currently occurring, and the location of the concept plans that have been presented to the City, for the purposes of this study, it will be assumed that the majority of the City’s 20-year growth will occur somewhere within the subdivision areas shown on Figure 6.1. However, it should be emphasized that it is not expected that all of these areas will completely develop completely within 20 years.

As for the ultimate growth area, which extends to the limits of the study area, Table 6.2 shows the estimated ultimate population of Eagle Lake based on the land use plan.

Table 6.2 - Estimated Ultimate Population Based on Land Use Plan			
	Area (acres)	Assumed Density (units/ac)	Estimated Population
Residential Land Use			
Low Density	1,121	2.5	7,119
Medium Density	87	4.2	922
Limited High Density	100	9.3	2,324
High Density	63	12.7	1,995
Subtotal			12,360
2004 Population			1,974
Total - Ultimate Growth Area Population			14,334

*Note: Each unit contains 2.5 residents