CHAPTER 2:
METHODOLOGY

Introduction

This chapter describes the methodology used to analyze the forecast traffic volumes and performance of the future transportation network. The technical methodology applied to this project primarily included the application of the Florida Standard Urban Transportation Model Structure (FSUTMS) travel demand forecasting model. The major steps include a review of the previous studies, development of revised socioeconomic data for the study area, and FSUTMS model network modifications. These steps are described in greater detail below and illustrated in Figure 2-1.

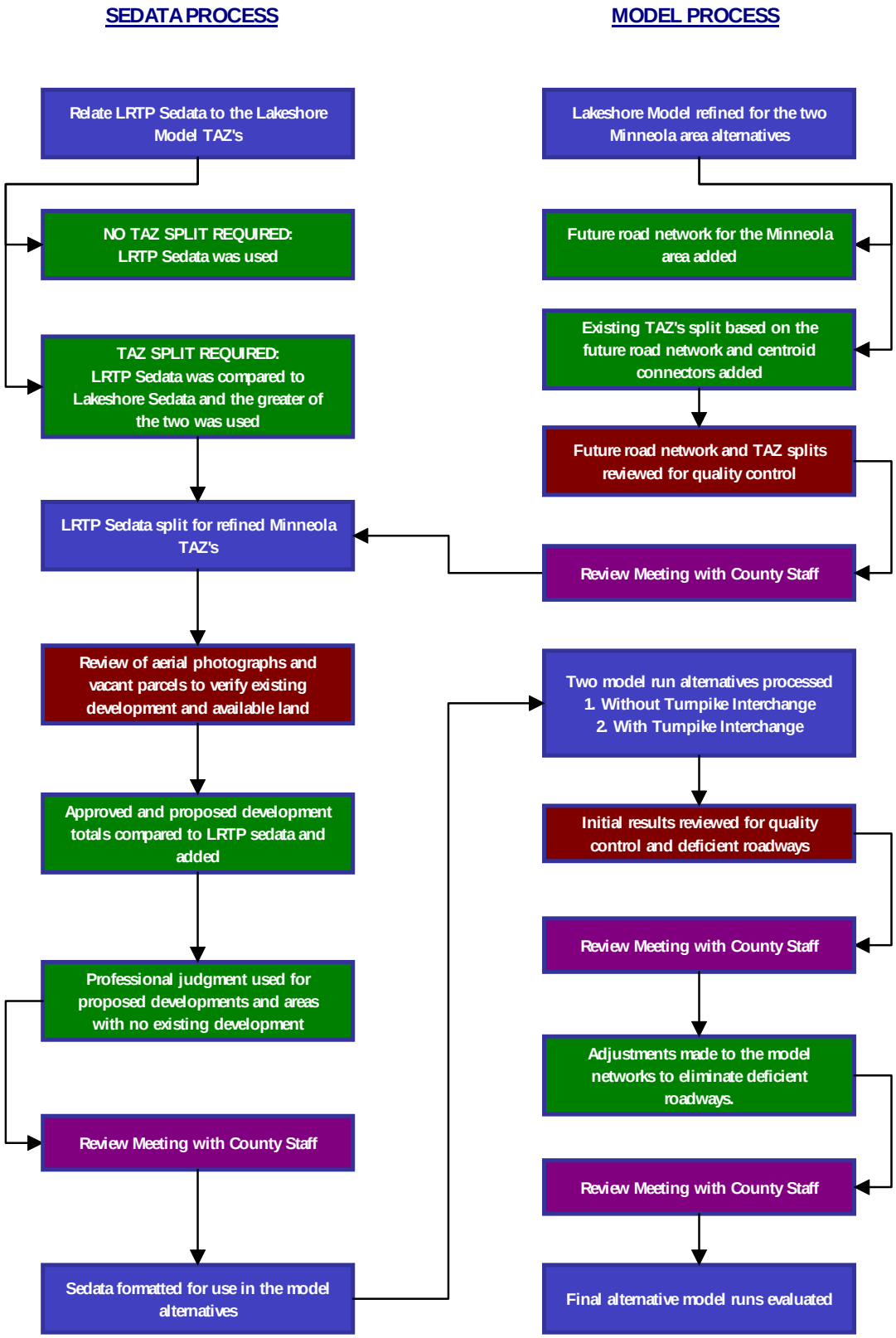
Previous Studies

The traffic volumes forecasted for this study were based on the FSUTMS travel demand model from previous studies and modified for this project as documented in the following sections. The FSUTMS model used for this study was developed in the following progression;

- Initially began with the 2020 Cost Feasible Transportation Plan Model (20G) developed for the Lake County 2020 Long-Range Transportation Plan (TOA, July 1999).
- The 20G model was first refined for use in the *Lake County Southeast Corridor Study Update* (TOA, March 2001) and the *Lake County Southeast Corridor Study Update* (TOA, July 2002).
- Subsequently, this FSUTMS model was further refined for the *Lakeshore Drive Area-Wide Traffic Study* (TOA, November 2003).

The Lake County LRTP 20G model was regional in nature, and accordingly, was an appropriate tool for forecasting travel demand at the regional level. However, in order to produce more reliable corridor level traffic volume forecast with a regional travel demand model, specific study area refinements were made to the model in previous studies. Consequently, several study area refinements were also made to the Minneola model. These refinements included additional collector roadways, modifications of roadway facility types, modification of the traffic analysis zone (TAZ) structure, and modification of the associated socioeconomic data. Therefore, the Minneola model retains the model refinements that were undertaken for all of the previously mentioned studies. In addition to the model refinements from the studies mentioned above, recent modifications made in the Lake County Long Range Transportation Plan (LRTP) Update were also included in the Minneola model. At the core of these changes were TAZ splits. TAZ's were split for the LRTP Update in areas that have experienced increased development or growth since the previous adopted LRTP (TOA, July 1999).

Figure 2-1
Methodology Process



Socioeconomic Data

Socioeconomic data (SE data) is the information pertaining to population, dwelling units, and employment that is an input into the FSUTMS model. Each TAZ contains a forecast of each of the above variables. Using these variables, the FSUTMS model generates the number of vehicle trips traveling from and to each TAZ. The socioeconomic data for the Minneola model was based on the socioeconomic data prepared for the LRTP Update (TOA, January 2005). In order to refine the socioeconomic data for the Minneola Study, approved and proposed developments within the study area were reviewed and the socioeconomic data prepared for the LRTP Update was split into the refined TAZ structure. Figure 2-1, on the previous page, illustrates the processes used to refine the socioeconomic data and model.

Minneola Approved and Proposed Developments

As previously indicated, the purpose of this study was to identify build-out transportation networks that would accommodate the significant growth projected for the study area. Major contributors to this growth will be the approved and proposed developments within the study area. Table 2-1 summarizes the total units by category (residential and non-residential) for each of the currently known approved and proposed developments. This information was used in the modification of the socioeconomic data described in the next section. These anticipated development levels were provided by County staff and added to the appropriate TAZ's in the refined socioeconomic data developed for this study. The location and quantity for each approved and proposed development is illustrated in Figure 2-2.

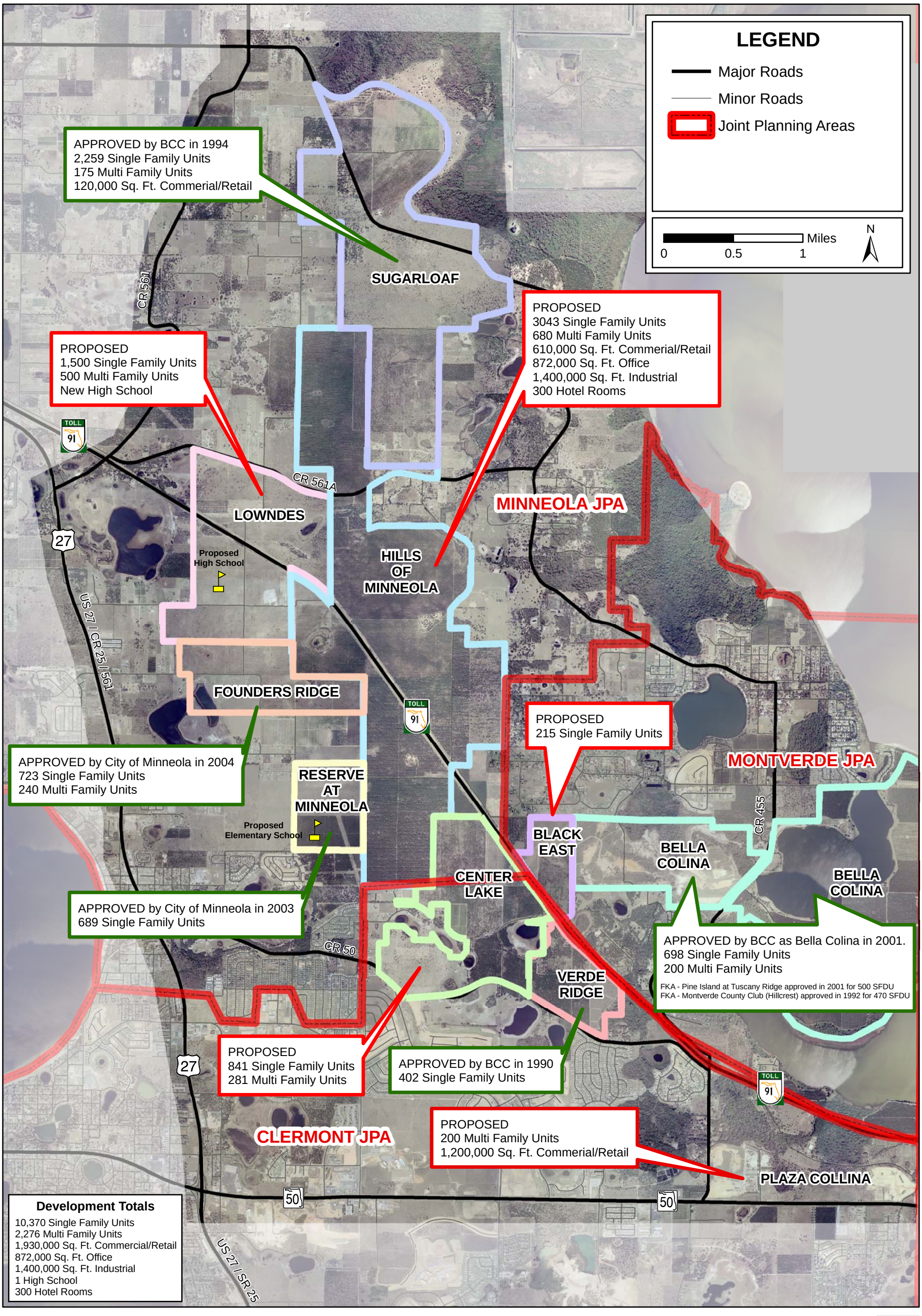
Table 2-1: Approved and Proposed Development Totals

Category	Approved Units
Single Family Dwelling Units	10,370
Multi Family Dwelling Units	2,276
Commercial/Retail (in sq.ft)	1,930,000
Office (in sq.ft)	872,000
Industrial (in sq.ft)	1,400,000
Hotels (number of rooms)	300

Source: Lake County Public Works

Modification to Socioeconomic Data

In order to forecast future travel demand more accurately, the number of TAZ's within the study area were increased by subdividing existing TAZ's to develop a more refined zonal structure. The socioeconomic data for the LRTP Update is the most recent future horizon forecast for Lake County and thus was considered the most reliable source of forecast data. In order to benefit from the model improvements developed in the



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MINNEOLA RIDGE AREA-WIDE TRAFFIC STUDY

Approved and Proposed Developments

Figure 2-2

Figure 2-2

Lakeshore Drive Area-Wide Traffic Study and other previous studies, refinements to the new forecast socioeconomic data were required to compensate for differences in the zonal structures.

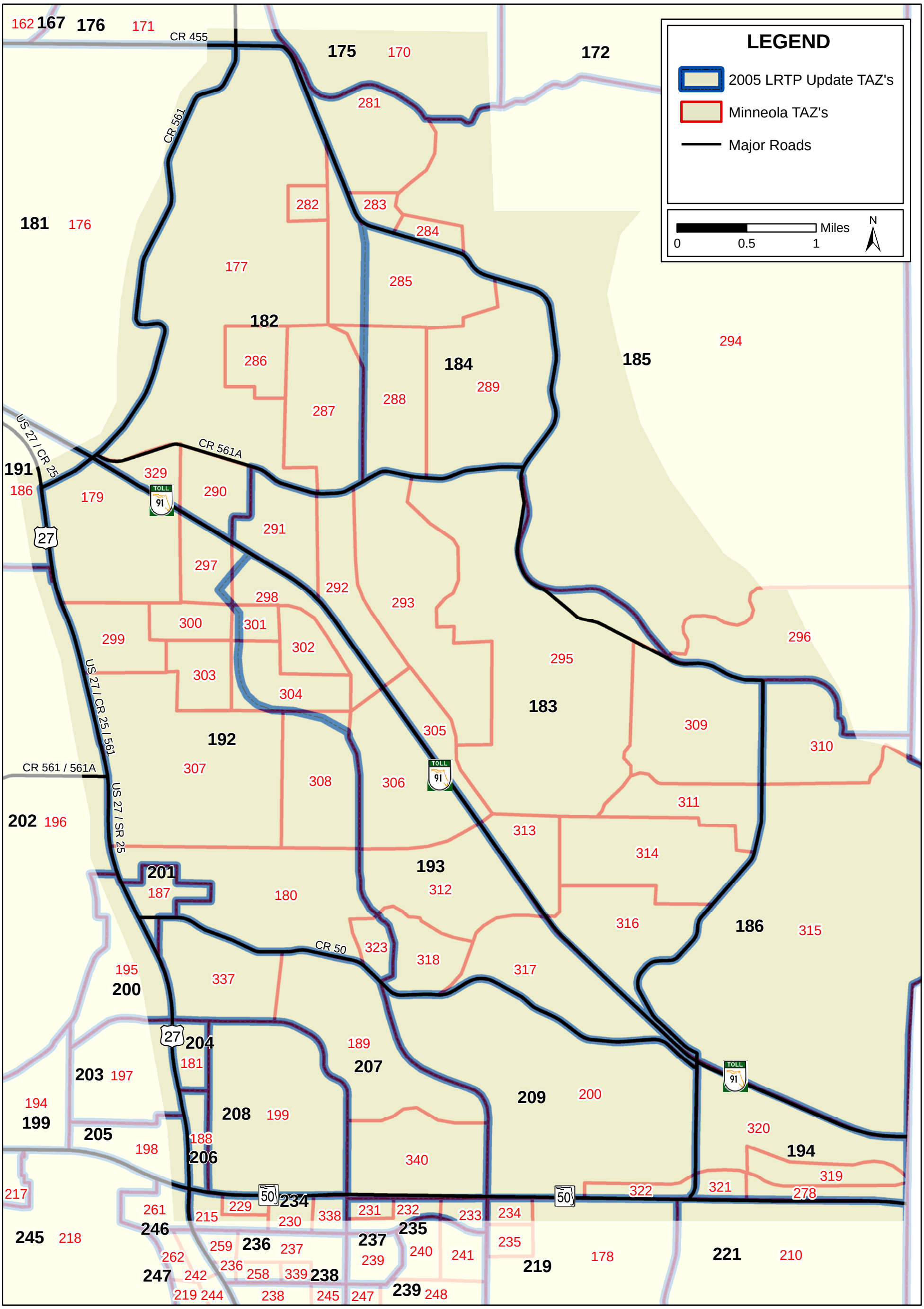
The TAZ's and corresponding socioeconomic data were refined in the process that is outlined below. Figure 2-3 illustrates the resulting TAZ structure for this study.

1. The socioeconomic data developed for the LRTP Update was compared to the socioeconomic data developed for the *Lakeshore Drive Area-Wide Traffic Study.*
    - The socioeconomic data for the LRTP Update was used for TAZ's that were an exact match between the two respective socioeconomic data sets.
    - TAZ's that were refined/split in the *Lakeshore Drive Area-Wide Traffic Study* were compared to the TAZ's from the LRTP Update. The socioeconomic data that resulted in the highest forecast of the two was used for this study.

    *NOTE: The end result of this step is a refined socioeconomic data set that consists of the LRTP Update socioeconomic data which matches the FSUTMS model refined in the *Lakeshore Drive Area-Wide Traffic Study.*

2. TAZ's in the Minneola study area were split to reflect the proposed road network similar to the previous studies mentioned in Chapter 1 (refer to Figure 2-2).
    - These TAZ splits were then reviewed in a meeting with County Staff for quality control purposes.

3. The socioeconomic data developed in step 1 was then split based on the refined TAZ structure in step 2.
    - The revised TAZ boundaries were superimposed on digital aerial photographs flown in 2002 to allow for further examination of the specific location of dwelling units and employment.
    - Review of vacant parcels using GIS further aided in the allocation of the socioeconomic data to the refined TAZ structure.
    - Approved and proposed development totals for the Minneola study area were reviewed against the LRTP totals and adjusted as necessary.
    - Professional judgment was used in proposed developments and areas having no existing development.



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Refined Traffic Analysis Zones

Figure 2-3

Figure 2-3

The end result of this process was a refined socioeconomic data set that incorporated the most recent socioeconomic data restructured to best represent the future demographic makeup of the Minneola study area. The Minneola socioeconomic data was formatted for use with the refined Minneola FSUTMS model. The refinements to the Minneola FSUTMS model network are described in detail in the next section.

Network Modifications

Two model network alternatives were produced for the Minneola Ridge Area-Wide Traffic Study. Alternative one included the future road network with and interchange on the Florida Turnpike (SR 91) approximately six miles north of the SR 50 interchange. Alternative two included the future road network without this interchange. As previously mentioned, the Minneola model network was refined using a FSUTMS model developed from previous studies. Both alternatives were developed from the same model. The model process was illustrated previously in Figure 2-1 (Page2-2). Appendix 2-A contains model network plots of the original model network and the two Minneola alternatives.

The first refinement made to the model involved adding segments that represented the future road network in the Minneola area. The future road network was provided by County Staff and represents funded and unfunded projects from the Lake County 2005-2009 Transportation Work Program. The only difference between the alternatives in the initial model networks was the interchange on the Florida Turnpike and the configuration of access across the Turnpike. The new road segments that were added were assumed to have a FSUTMS area type of 33. An area type of 33 is defined as transitioning areas/urban areas over 5,000 population. The collector roads added were assumed to have a FSUTMS facility type of 42 or 43. Facility types of 42 and 43 are defined as major local undivided roadways. Appendix 2-A contains model network plots of the area types and facility types for the Alternatives.

The second refinement entailed the creation of centroid connectors. Centroid connectors represent the TAZ's within the travel demand model. Again, each TAZ contains socioeconomic data variables. The FSUTMS model uses these variables to forecast travel demand on the future network. TAZ's are usually bounded by roads or geographic features, such as water bodies. Therefore, adding the future road network to the model required the modification of the existing TAZ boundaries. New centroid connectors were added to the model to represent these new TAZ's and they correspond with the socioeconomic data set that was discussed in the previous section.