

Final Report

City of Lakeland Special Area Transportation Study

Prepared for:
The City of Lakeland, TN
January 2009

Project No. 115009002



Engineering, Planning, and Environmental Consultants

TABLE OF CONTENTS

	<u>Page</u>
1.0 Introduction	1
1.1 Purpose of Study	1
1.2 Description of Study Area	2
1.3 Study Goals and Objectives	2
2.0 Study Methodology	3
2.1 Base Year Subarea Model Development	4
2.2 Full Build-out Demographic and Economic Forecasts	4
3.0 Future Traffic Growth and Impacts	8
4.0 Alternative Solutions to Relieve Traffic Congestion	10
4.1 Roadway Improvement Alternatives	10
4.2 Full Build-out Traffic Volume and Level of Service Analysis	13
4.3 Comparison of Alternatives	14
5.0 Public Involvement	15
5.1 Public Meeting #1 – December 13, 2007	15
5.2 Public Meeting #2 – June 17, 2008	16
5.3 Public Input and Plan Considerations	16
6.0 Summary and Conclusions	19
7.0 Additional Considerations	23
Appendix A – Technical Memorandum # 1: Lakeland Base Year (2004) Travel Demand Model Development	
Appendix B – TAZ ID Map and Full Build-out Demographic and Economic Forecast by TAZs	
Appendix C – Existing Land Use Plan and Major Road Plan	
Appendix D – Project Meeting Minutes, Public Meeting Questionnaires and Summaries	

LIST OF TABLES

	<u>Page</u>
Table 1 – Land Use Breakdowns	5
Table 2 – Dwelling Density by Neighborhood Type	6
Table 3 – Floor Area Ratio and Employment Rates by Land Use Type	6
Table 4 – Roadway Level of Service (LOS) Definitions	9
Table 5 – Summary of Major Differences Between Existing Major Road Plan and Alternatives	12
Table 6 – Summary of Major Differences Between Existing Major Road Plan and The Recommended Plan Update	21
Table 7 – MPO Planned Roadway Improvements	22
Table 8 – Projects in MPO’s Existing Major Road Plan	25

LIST OF FIGURES

	<u>After Page</u>
Figure 1 – Study Area and Existing Laneage	2
Figure 2 – Baseline Traffic Volume and Level of Service	8
Figure 3 – Alternative 1 Highway Network	11
Figure 4 – Alternative 2 Highway Network	11
Figure 5 – Alternative 1 Traffic Volume and Level of Service	13
Figure 6 – Alternative 2 Traffic Volume and Level of Service	13
Figure 7 –Recommended Transportation Plan	20

1.0 INTRODUCTION

The City's existing Major Road Plan is based on the recommendations developed by Kimley-Horn and Associates, Inc as a part of the Transportation Improvement Study finished in 2004. After the 2004 study, the City adopted a new Land Use Plan. In addition, the 2004 study was based on the old Travel Demand Model for the Memphis Area Metropolitan Planning Organization (MPO). The MPO updated its Travel Demand Model in 2007 and its Long Range Transportation Plan (LRTP) in 2008. The new Land Use Plan warrants an update of the existing Major Road Plan, and the new MPO Travel Demand Model provides a more capable tool to forecast the future year traffic volume, identify congestion, and evaluate deficiencies and solutions. This study is an amendment to the Lakeland Comprehensive Plan adopted in 2006.

1.1 Purpose of Study

The purpose of the Lakeland Special Area Transportation Study is to evaluate the ability of the planned roadway system to accommodate future traffic volumes upon ultimate build-out of the City of Lakeland and its annexation reserve areas in accordance with the recently adopted Land Use Plan. In addition, the study identifies recommendations for improvements to mitigate anticipated traffic congestion resulting from development within the study area. This study includes evaluation of the planned future roadway network and impacts on the study area's roadway network resulting from existing, approved, and future developments based on full build-out of the City according to the adopted Land Use Plan.

As part of the study, a subarea Travel Demand Model for the City of Lakeland (Lakeland Model) was developed based on the MPO Travel Demand Model and validated based on the base year (2004) existing traffic volumes. The Land Use Plan and the Major Road Plan were incorporated into the Lakeland Model. The Lakeland Model was then used to forecast the traffic volumes for the full build-out scenario. In addition, two public meetings were conducted to solicit input from the public on existing roadway network deficiencies, needs, and soliciting comments on recommendations. Deficiencies of the existing Major Road Plan were analyzed and recommendations for improvements were made based on the existing and future transportation needs of the community.

1.2 Description of Study Area

The study area for this project includes the City of Lakeland and the Lakeland Reserve Area. The boundaries of the study area, as illustrated in **Figure 1**, are Pleasant Ridge Road on the north, Highway 64 on the south, Brunswick Road on the west, and Chambers Chapel on the east. The study area is approximately 24.6 square miles in northeastern Shelby County. The 2008 City population is approximately 11,000. The major roadways that serve the study area are Highway 64, Interstate 40, Highway 70, State Route 385, Brunswick Road, Canada Road, and Chambers Chapel Road. Existing commercial developments are concentrated on the areas adjacent to Interstate 40 and Highway 64.

1.3 Study Goals and Objectives

The goals of the study were established in public meetings and coordinating with the City of Lakeland staff. The goals of the study were:

- Preserve existing scenic corridors,
- Consider multimodal concept of complete streets with median and roadside landscaping,
- Provide for traffic congestion relief,
- Provide for north-south connectivity, and
- Provide for east-west connectivity.

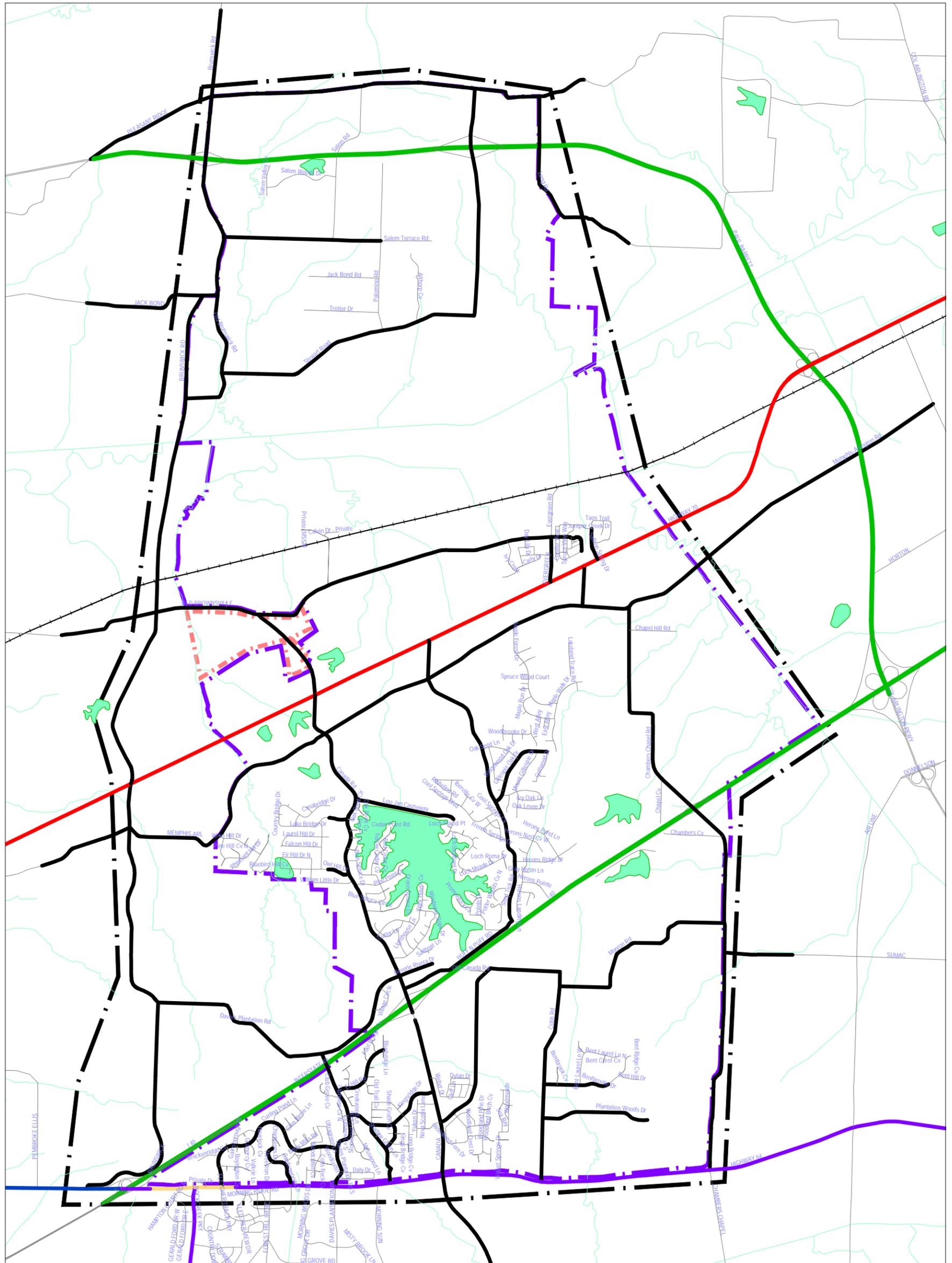
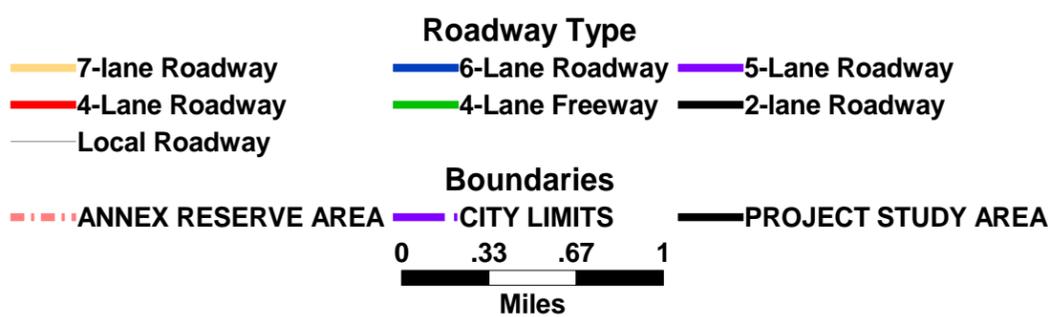


FIGURE 1 STUDY AREA AND EXISTING LANEAGE



Kimley-Horn and Associates, Inc.

2.0 STUDY METHODOLOGY

To determine the deficiencies of the existing and proposed roadway network, forecasting the future year traffic with reasonable accuracy is of major importance. As a suburban city in the Memphis Metropolitan Area, the travel behaviors of Lakeland residents are closely related to the rest of the region. Employees and customers of the existing and future commercial development in Lakeland are also closely coupled with the rest of the region. To more accurately forecast the future traffic of City of Lakeland, a methodology from the regional level was used.

In 2007, the Memphis MPO finished updating its regional travel demand model. The updated regional model provided a more capable tool of forecasting travel demand. The demographic and economic forecasting process of the regional model employed a rigorous analytical model and was reviewed by local planners and a national peer review panel. The model was validated following state and federal guidelines and was approved for use by the Tennessee Department of Transportation (TDOT). All future projects identified in the 2026 MPO Long Range Transportation Plan (LRTP) were included in the regional model. One goal of the regional model is to enable future development of subarea models for suburban cities such as City of Lakeland.

Since the regional model is used primarily to forecast traffic volumes on arterial roadways, the traffic analysis zones (TAZ) in the suburban and rural areas are quite large, and many roadways that are significant to City of Lakeland are not included in the regional model. A subarea travel demand model for City of Lakeland was developed based on the regional model to be able to model routes important to the City. The subarea model inherited all the benefits from the regional model, such as more accurate regional demographic and economic forecasts and state-of-practice trip generation, distribution, and traffic assignment models. This subarea model was used in this study to forecast the future traffic volumes for the full build-out scenario of the City of Lakeland.

This section describes the subarea model development process and the methodology used to forecast the demographic and economic characteristics in the full build-out scenario.

2.1 Base Year Subarea Model Development

As the first step of the Lakeland Model development process, the base year (2004) model needed to be developed and validated to make sure that the subarea model can reproduce and represent the base year traffic condition with reasonable accuracy. Existing TAZs in the study area were reviewed and recommendations were made to split the TAZs from 14 to 50. The refined TAZ structure allows enough granularities to capture the full build-out land use, zoning, and new future roadways. Next, roadways that are significant in the Lakeland area were added to the highway network with their characteristics coded properly. After that, the demographic and employment distribution were adjusted based on the new TAZ structure. The traffic assignment results from the subarea model were then compared with the collected traffic counts to evaluate the model performance and validate the model. **Technical Memorandum # 1** – Lakeland Base Year (2004) Model Development, attached as **Appendix A** of this report, details the base year subarea model development process.

2.2 Full Build-out Demographic and Economic Forecasts

For the full build-out scenario, trips are produced and attracted to each traffic analysis zones for the following nine trip purposes:

- Journey to work
- Home based school
- Home based university
- Home based shopping
- Home based social-recreational
- Home based pickup/drop-off
- Home based other
- Non-home based work
- Non-home based non-work

In the trip production model, the number of trips produced by each household is determined by its characteristics. For example, the number of Journey to Work trips a household produces per day depends on how many workers are in the household, the income level, and the number of vehicles in the household. In the trip attraction model, the number of trips attracted to each TAZ for each trip

purpose is determined by the commercial mix. For example, how many Journey to Work trips are attracted to a particular zone depends on the total employment of the destination zone. Similarly, the total Home Based Shopping trips are determined by the scale of the retail, which is represented by the number of retail employment.

The Land Use Plan designates the types of land use for each traffic analysis zone, such as residential (Rural, Ex-Urban, or Suburban), commercial, or mixed use. See **Appendix C** for the existing Land Use Plan. To translate the Land Use Plan to travel demand model input, the area size designated for each land use type must be known. This was done by overlaying the Land Use Plan with the TAZ boundaries and measuring the area for each TAZ by each land use type. Since the model inputs require the specific type of commercial development (office, retail, or industrial), the commercial mix was further divided to specific commercial categories. **Table 1** shows the Land Use break down used in this study for different land use types. These distributions are based on the typical development scenario described in the Comprehensive Land Use Plan Update document.

Table 1 - Land Use Breakdowns

Land Use Type	Component Breakdown					Total
	Residential		Commercial			
	Single Family	Multi Family	Retail	Industrial	Office	
Mixed Use Center	17%	31%	26%	-	27%	100%
Residential Support Center	-	-	71%	-	29%	100%
Suburban with TND Overlay	91%	-	9%	-	-	100%
Employment Center	-	-	23%	-	77%	100%
Industrial	-	-	-	100%	-	100%

The total number of dwelling units or households was forecasted based on the dwelling density shown in **Table 2** for each residential land use type. The model also requires more detailed break downs for the following household characteristics:

- Households by number of persons,
- Households by number of workers,
- Households by annual income, and
- Households by age group (under 18, age 18-64, and age 65 and over)

The distributions of these categories were directly borrowed from the demographic forecasts in the Regional Model.

Table 2 - Dwelling Density by Neighborhood Type

Land Use Type	Dwelling Density (Household Units/Acre)
Rural	0.2
Ex-Urban	0.29
Suburban	2.5
Suburban (TND)	3.5
Mixed Use Center (Single Family)	2.5
Mixed Use Center (Multi Family)	10.0

The last step in providing land use inputs was to forecast the total number of employment for each TAZ based on the commercial land use type. In the absence of detailed site plans, full development of each analysis zone was assumed with the maximum floor area ratios of 0.20 for retail, 0.25 for industrial, and 0.25 for general office. Along with the maximum floor area ratios, the employment types were assumed to have employment per 1,000 square feet of floor space of 1.97 for retail, 1.8 for industrial, and 3.49 for general office. The employment density was developed based on the ITE Trip Generation Manual and compared with similar studies for consistency. The floor area ratio and employment rates are summarized in **Table 3**.

Table 3 - Floor Area Ratio and Employment Rates by Land Use Type

Land Use by Employment Type	Floor Area Ratio	No. of Employees per 1,000 sqft
Retail	0.20	1.97
Industrial	0.25	1.80
General Office	0.25	3.49

School enrollment data for the full build-out scenario was forecasted based on new school locations identified on the Land Use Plan. It was assumed that future schools in the full build-out scenario would have the same number of students as existing schools.

Appendix B provides a map showing the forecasted total number of household and employment by TAZ. A table is also included to show more detailed breakdown of demographic and economic forecasts for the full build-out scenario by TAZ.

During the course of this study, the City was still in the process of updating the zoning and development regulations based on the Land Use Plan. The project team worked together with the City and their consultant (Farr and Associates) to review the land use parameters and assumptions used in this study. As a part of this effort, Farr and Associates examined the developable area sizes of each zone and estimated the minimum and maximum development densities by subdivision type. The project team spot checked TAZs using the data provided by Farr and Associates. The results showed that the forecasts developed in this study are generally using higher development density. The traffic forecasting methodology and the potential impact of over-estimation on demographic and economic data was discussed with the City. Based on the traffic assignment results and the volume to capacity ratio calculated during the deficiency analysis, it is believed that the City's rezoning and development regulation update effort is likely to have negligible impact on the recommendations of this study.

The demographic and economic forecasts were used as input of the Lakeland Model to forecast the future traffic growth and identify the deficiencies, as described in the next section.

3.0 FUTURE TRAFFIC GROWTH AND IMPACTS

Based on the demographic and economic forecasts developed using the Land Use Plan, the Lakeland Model was used to forecast the future traffic growth on the full build-out scenario. For deficiency analysis purposes, a baseline scenario was identified. The baseline scenario is defined as the full build-out demographic and economic characteristics, and the roadway improvements identified in the existing Major Road Plan. The existing Major Road Plan is included in **Appendix C** for reference. The baseline scenario model run was conducted and the projected trips in the full build-out condition were assigned to the network representing the existing Major Road Plan.

To identify roadway congestion, a term known as Level of Service (LOS) is used. Roadway LOS is a qualitative measure of roadway performance based on roadway capacity, traffic volume, intersection delay, and average speed, as outlined in the Transportation Research Board's Highway Capacity Manual (HCM). The methods in this document were used to determine roadway capacities and Levels of Service for each roadway.

Table 4 describes roadway LOS and the associated traffic conditions for each LOS designation. Roadway LOS is given a letter designation ranging from LOS A (free-flow operations and minimal delays) to LOS F (extreme congestion, low speeds, and long delays).

For this study, LOS A - LOS C is defined as the range of acceptable operations and LOS D - LOS F as the range of unacceptable traffic conditions. **Figure 2** illustrates the projected traffic volume and Level of Service (LOS) on the existing Major Road Plan.

The results from the baseline scenario revealed that the laneage in the existing Major Road Plan appears to be excessive for a group of roadway segments. While most of the routes in the study area will operate with an acceptable Level of Service, roadways that are not projected to operate with Level-of-Service C or better in the study area are:

- Highway 64 from Brunswick Road to the north future extension of Monroe Road west of Chambers Chapel
- I-40 through the City Limits
- Brunswick Road from new Canada Road to Stewart Road
- Canada Road from El Hill Road to I-40

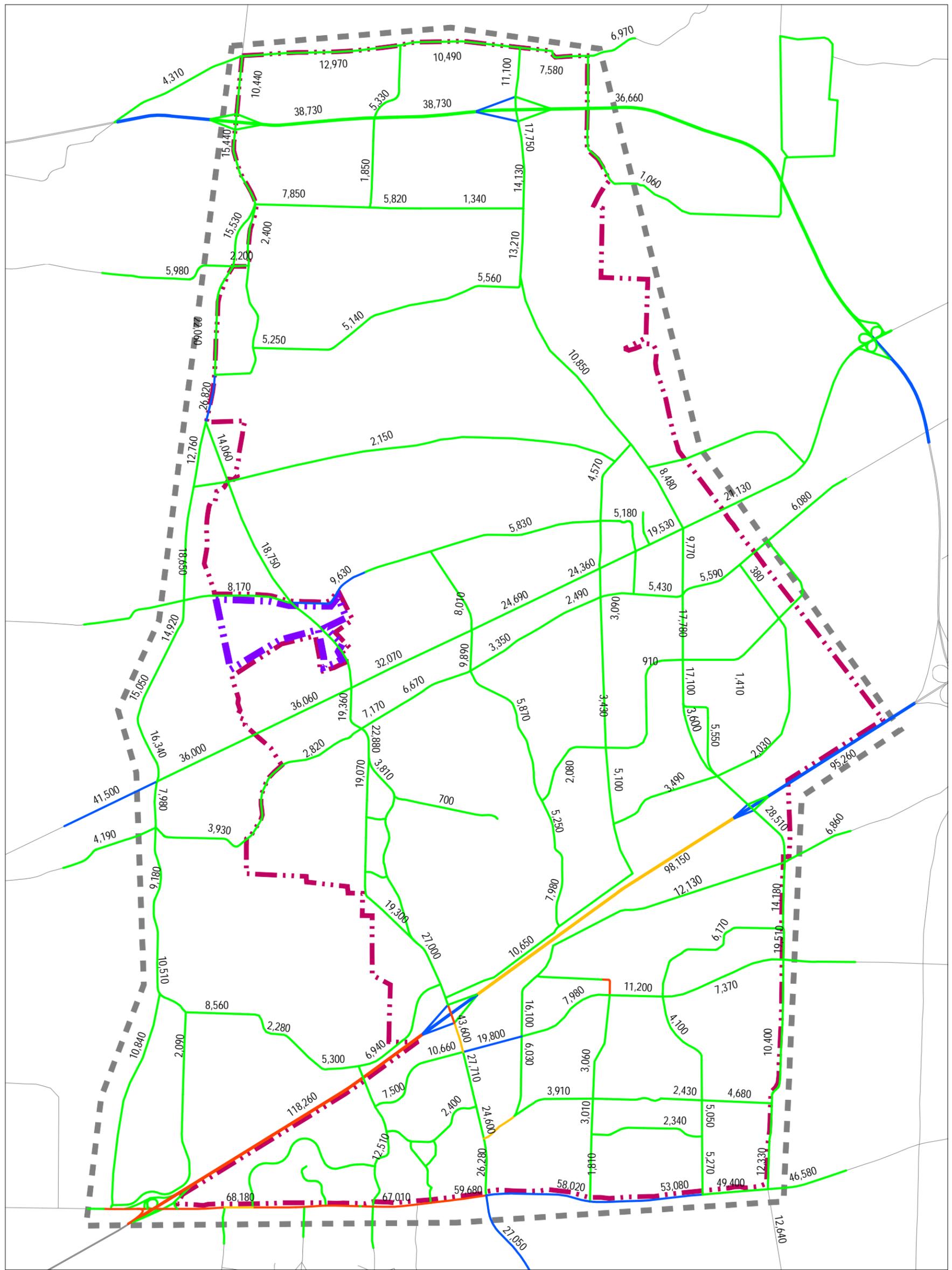


FIGURE 2
FULL BUILD-OUT HIGHWAY NETWORK
EXISTING MAJOR ROAD PLAN
TRAFFIC VOLUME AND LEVEL OF SERVICE

LEGEND

- | | |
|-------------------|-------------------------|
| Boundaries | Level of Service |
| --- City Limits | --- LOS C or Better |
| --- Annex Reserve | --- LOS D |
| --- Study Area | --- LOS E |
| | --- LOS F |
- 0 .33 .67 1
 Miles



Kimley-Horn and Associates, Inc.

- El Hill Road Extension from Canada Road to Monroe Road
- Existing Monroe Road east of Canada Road
- Old Brownsville Road east of Canada Road

Table 4 - Roadway Level of Service (LOS) Definitions

LOS		Description
Acceptable	A	Free-flow traffic operations at average travel speeds. Vehicles completely unimpeded in ability to maneuver. Minimal delay at signalized intersections.
	B	Reasonably unimpeded traffic operations at average travel speeds. Vehicle maneuverability slightly restricted. Low traffic delays.
	C	Stable traffic operations. Lane changes becoming more restricted. Travel speeds reduced to half of average free flow travel speeds. Longer intersection delays.
Unacceptable	D	Small increases in traffic flow can cause increased delays. Delays likely attributable to increase traffic, reduced signal progression and adverse timing.
	E	Significant delays. Travel speeds reduced to one third of average free flow travel speed.
	F	Extremely low speeds. Intersection congestion. Long delays. Extensive traffic queues at intersections.

Based on the traffic volumes obtained from the baseline scenario, an analysis was then performed to determine future roadway laneage requirements to accommodate traffic demand with an acceptable Level-of-Service for the congested areas. At the same time, the laneage of planned roadways with excessive capacity was reduced. This analysis is described in more detail in the next section.

4.0 ALTERNATIVE SOLUTIONS TO RELIEVE TRAFFIC CONGESTION

4.1 Roadway Improvement Alternatives

Roadway improvements for the planned future roadway network were developed based on the findings of the roadway capacity analysis and projected future roadway deficiencies. In the baseline scenario, the projected trips in full build-out condition were assigned to the network representing the existing major road plan. An analysis was performed to determine future roadway laneage requirements to accommodate traffic demand with an acceptable Level-of-Service. This analysis identified the required number of lanes without regard for right-of-way constraints or cost. This analysis did not include an evaluation of traffic operations at intersections, which may reveal the need for additional auxiliary lanes or turn lanes.

The results from the baseline scenario revealed that the laneage in the existing Major Road Plan appears to be excessive for a group of roadway segments. The laneage on these segments was revised to accommodate the preliminary traffic volumes. This analysis was then compared to the Transportation Goals and Objectives and tempered by other constraints in the study area listed below:

- Restriction of rights-of-way,
- Construction cost and feasibility considerations,
- Approved site plans and existing roadway locations,
- Scenic corridor preservation (Memphis Arlington Road, Seed Tick Road, Cobb Road, Monroe Road, and Old Brownsville Road), and
- City's comments based on overall land use planning context.

A more detailed discussion on the process of resolving roadway alignment differences and new roadway locations can be found in the project meeting minutes in **Appendix D**. Two potential alternative roadway solutions were developed.

Figure 3 and **Figure 4** illustrate the Alternative 1 and Alternative 2 roadway networks. The figures show the basic number of lanes with median type designation (divided, undivided, or two way left

turn lane). New roadways are shown as dashed lines. The differences between the existing Major Road Plan and the two alternatives are summarized in **Table 5**. The differences between Alternative 1 and Alternative 2, as highlighted in the Table, are:

- New I-40 crossing location:
In Alternative 1, Cobb Road extends northwest, crosses I-40 and ties into Seed Tick Road. In Alternative 2, Cobb Road extends northeast, crosses I-40 and ties into Lakeland Trace Road

- Alignment of Monroe Road extension for connection to future Donnelson Parkway:
The future Donnelson Parkway in Arlington is likely to tie into Chambers Chapel at existing Monroe Road. In Alternative 1, Monroe Road extends east, then curves north following the edge of the power transmission line and follows existing Monroe Road east to Chambers Chapel. In Alternative 2, Monroe Road follows the same alignment as is shown in the existing Major Road Plan. Monroe Road extends east and ties into Chamber's Chapel at Sumac Road.

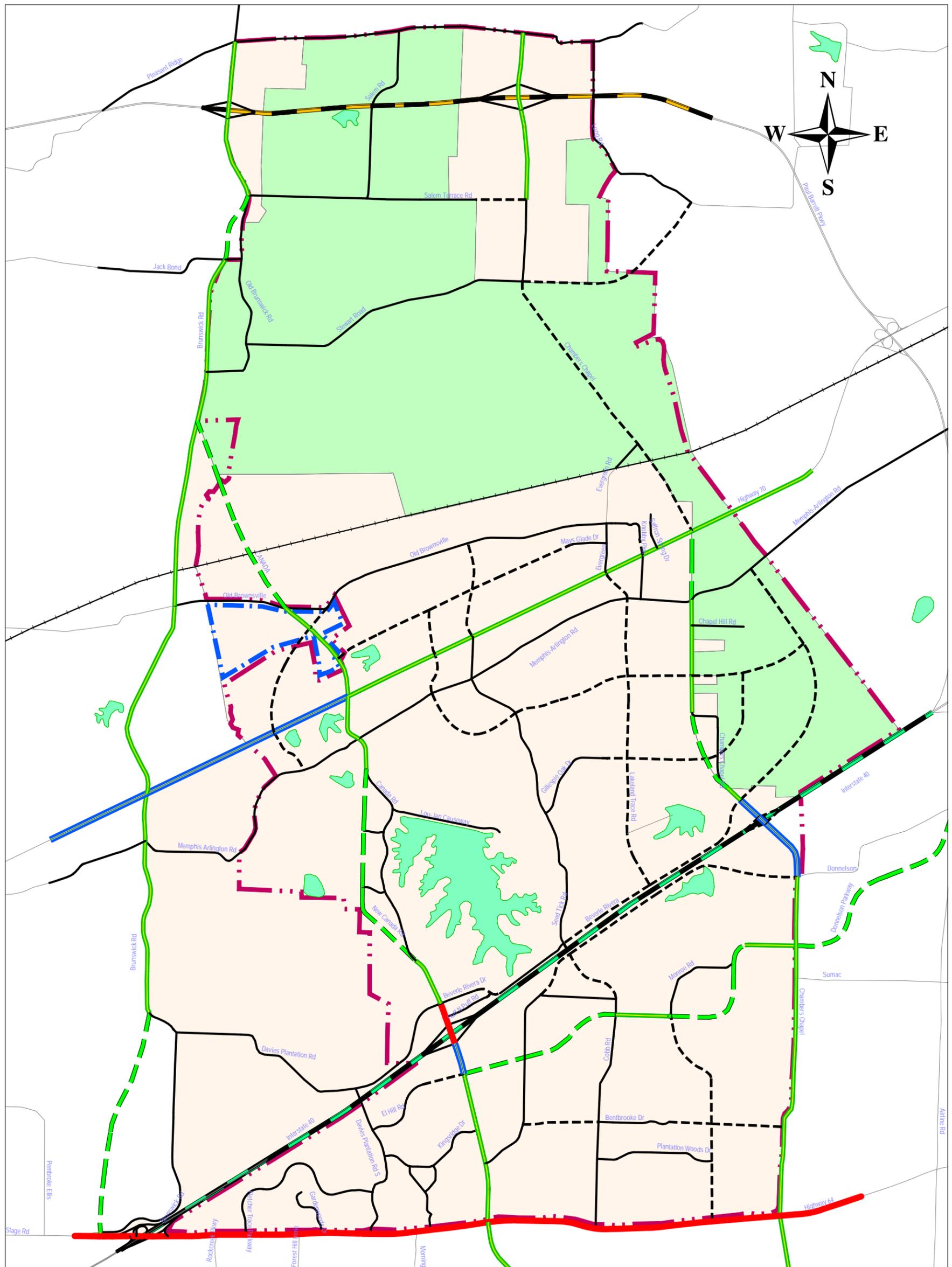
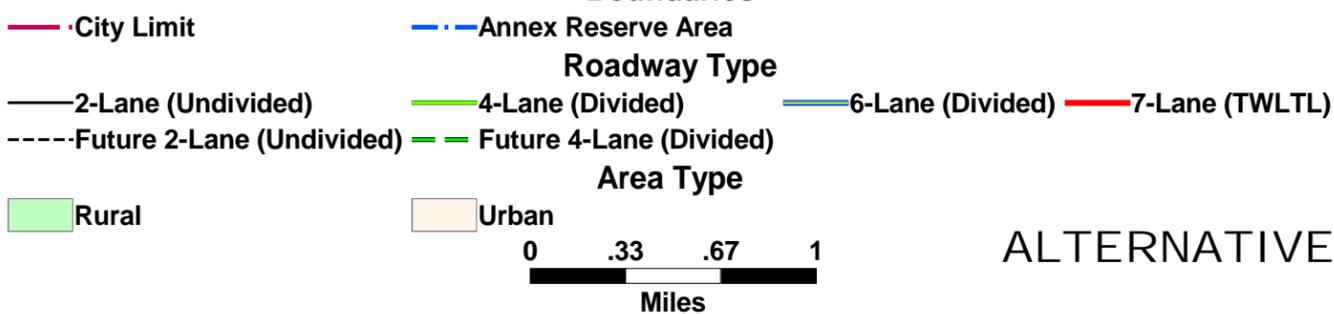


FIGURE 3 FULL BUILD-OUT HIGHWAY NETWORK



ALTERNATIVE 1



Kimley-Horn and Associates, Inc.

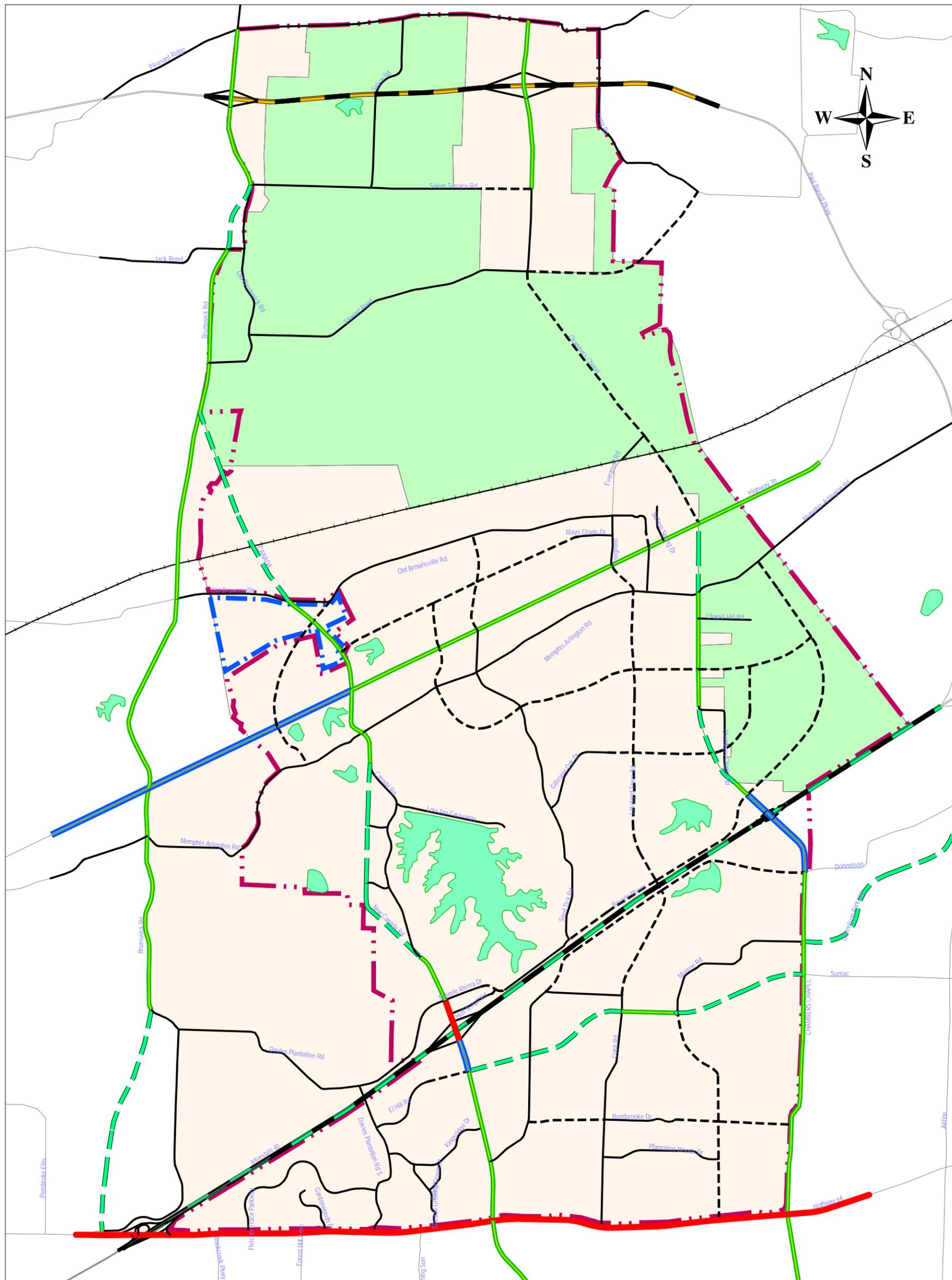
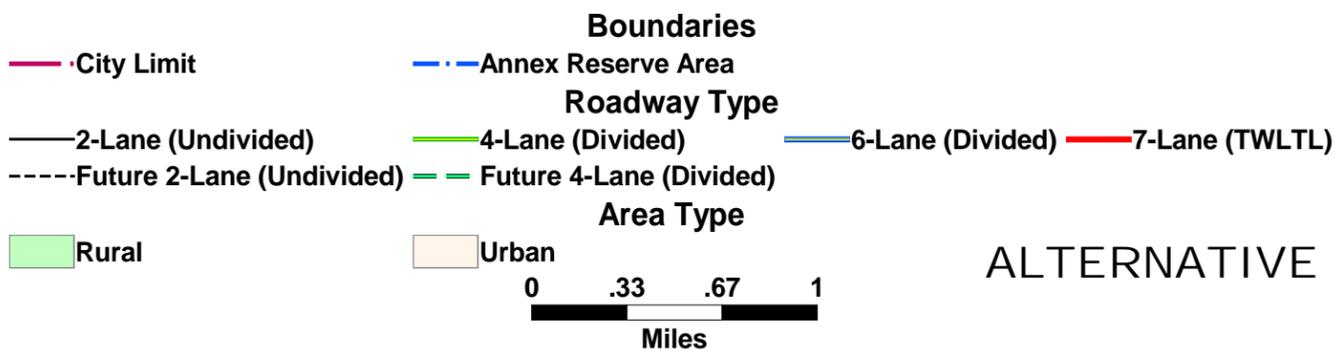


FIGURE 4 FULL BUILD-OUT HIGHWAY NETWORK



ALTERNATIVE 2

Table 5 - Summary of Major Differences Between Existing Major Road Plan and Alternatives

Route	Location	Existing Major Road Plan	Alternative 1	Alternative 2
Alternative I-40 Crossing	Cobb Rd extension to north	None	Crossing I-40 and tie into Seed Tick Rd	Crossing I-40 and tie into Lakeland Trace Rd
Beverle Rivera Rd	Canada Rd to Chambers Chapel	4-lane roadway, terminates at Lakeland Trace Rd	2-lane (undivided), extends to Chambers Chapel	2-lane (undivided), extends to Chambers Chapel
Canada Road	Davies Plantation Rd to Old Canada Rd	6-lane roadway	4-lane (divided)	4-lane (divided)
Canada Road	Highway 64 to El Hill Rd	6-lane roadway	4-lane (divided)	4-lane (divided)
Chambers Chapel Road	Highway 70 to Salem Terrace Rd	4-lane roadway	2-lane (undivided)	2-lane (undivided)
Chambers Chapel Road	Sumac Rd to Donelson Rd	6-lane roadway	4-lane (divided)	4-lane (divided)
Davies Plantation Rd	Davies Plantation Rd South to Canada Rd	4-lane roadway	2-lane (undivided)	2-lane (undivided)
Davies Plantation Rd South	Highway 64 to Davies Plantation Rd	4-lane roadway	2-lane (undivided)	2-lane (undivided)
El Hill Rd Extension	Davies Plantation Rd South to Canada Rd	4-lane roadway	2-lane (undivided)	2-lane (undivided)
Highway 70	Brownsville Rd to Canada Rd	4-lane roadway	6-lane (divided)	6-lane (divided)
Loosahatchie Parkway	Brownswick Rd to Evergreen Rd	2-lane roadway	Removed	Removed
Memphis Arlington Rd	Canada Rd to Seed Tick Rd	4-lane roadway	2-lane (undivided)	2-lane (undivided)
Monroe Rd	E-W extension	Tie into Sumac Rd	Tie into future Donnelson Pkwy in Arlington	Tie into Sumac Rd
New E-W road north of Highway 70	Canada Rd to Chambers Chapel	None	New 2-lane road	New 2-lane road
New E-W road south of Memphis Arlington Rd	Seed Tick Rd to Chambers Chapel and east	None	New 2-lane road	New 2-lane road
New road south and parallel to I-40	Monroe Rd to Chambers Chapel	4-lane roadway	2-lane (undivided)	2-lane (undivided)
Old Brownsville Rd Extension	Canada Rd to Memphis Arlington Rd	None	New 2-lane road	New 2-lane road
Salem Terrace Rd	Brownsville Rd to Stewart Rd	4-lane roadway	2-lane (undivided)	2-lane (undivided)
Seed Tick Rd	Memphis-Arlington Rd to Highway 70	4-lane roadway	2-lane (undivided)	2-lane (undivided)

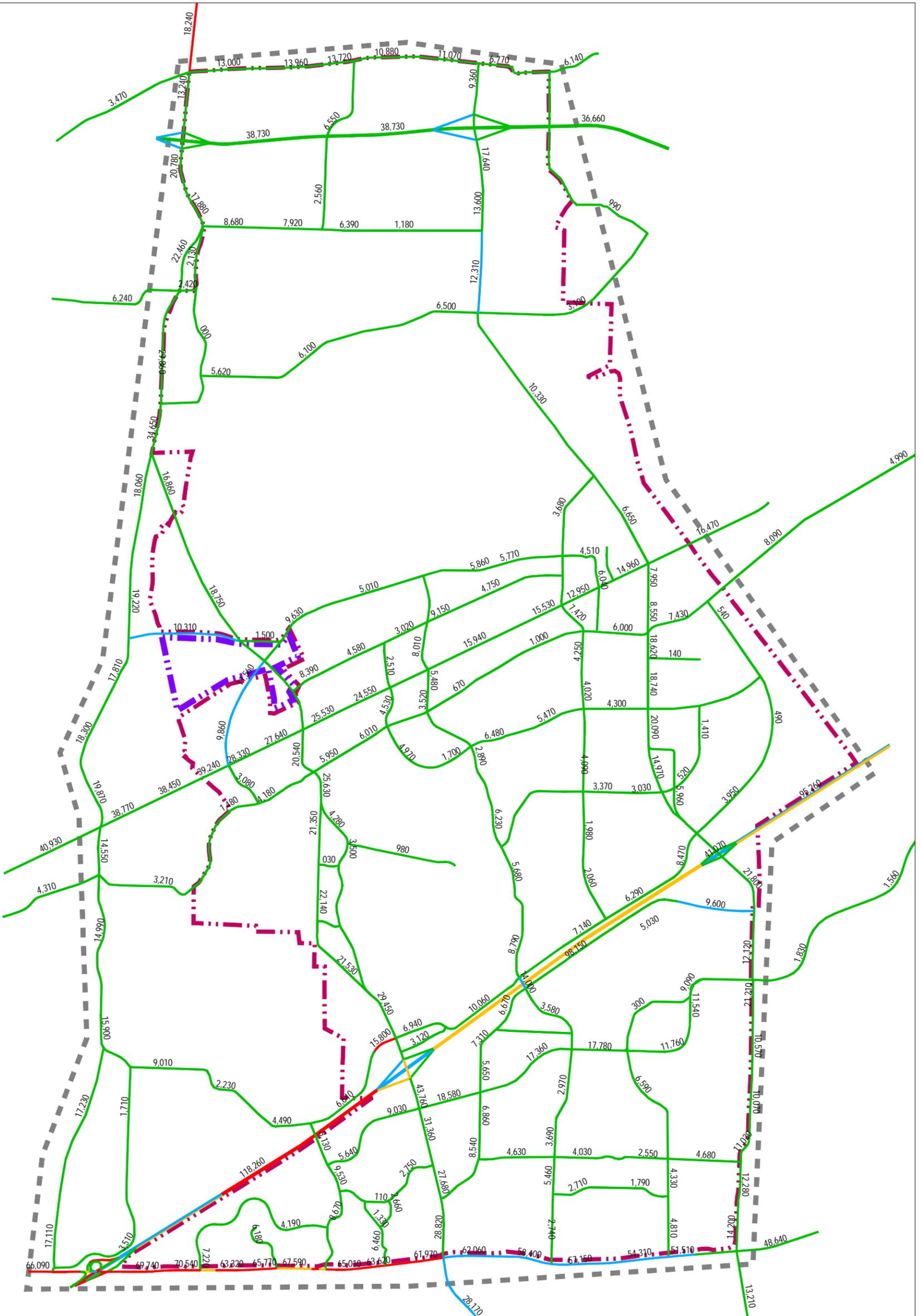
4.2 Full Build-out Traffic Volume and Level of Service Analysis

Figure 5 illustrates the anticipated traffic volumes and Levels of Service on the Alternative 1 roadway network at full build-out of the study area. The majority of routes in the study area will operate with an acceptable Level-of-Service. Roadways that are not projected to operate with Level-of-Service C or better in the study area are:

- Highway 64 from Brunswick Road to Chambers Chapel
- I-40 through the City Limits
- New I-40 crossing at Seed Tick Road
- New road south of and parallel to I-40, from east of Lakeland Trace Road to Chambers Chapel
- Canada Road over I-40
- Davies Plantation Road from Davies Plantation Road South to Canada Road
- Old Brownsville Road extension from Canada Road to Highway 70
- Old Brownsville Road from Brunswick Road to Canada Road
- Chambers Chapel Road from Stewart Road to Salem Terrace Road

Figure 6 illustrates the anticipated traffic volumes and Levels of Service on the Alternative 2 roadway network at full build-out of the study area. Because of the similarities between two alternatives, all routes in the study area are projected to operate with the same Levels-of-Service as Alternative 1. Roadways that are not projected to operate with Level-of-Service C or better in the study area are:

- Highway 64 from Brunswick Road to Chambers Chapel
- I-40 through the City Limits
- New I-40 crossing at Lakeland Trace Road
- New road south of and parallel to I-40, from east of Lakeland Trace Road to Chambers Chapel
- Canada Road over I-40
- Davies Plantation Road from Davies Plantation Road South to Canada Road
- Old Brownsville Road extension from Canada Road to Highway 70
- Old Brownsville Road from Brunswick Road to Canada Road
- Chambers Chapel Road from Stewart Road to Salem Terrace Road



LEGEND

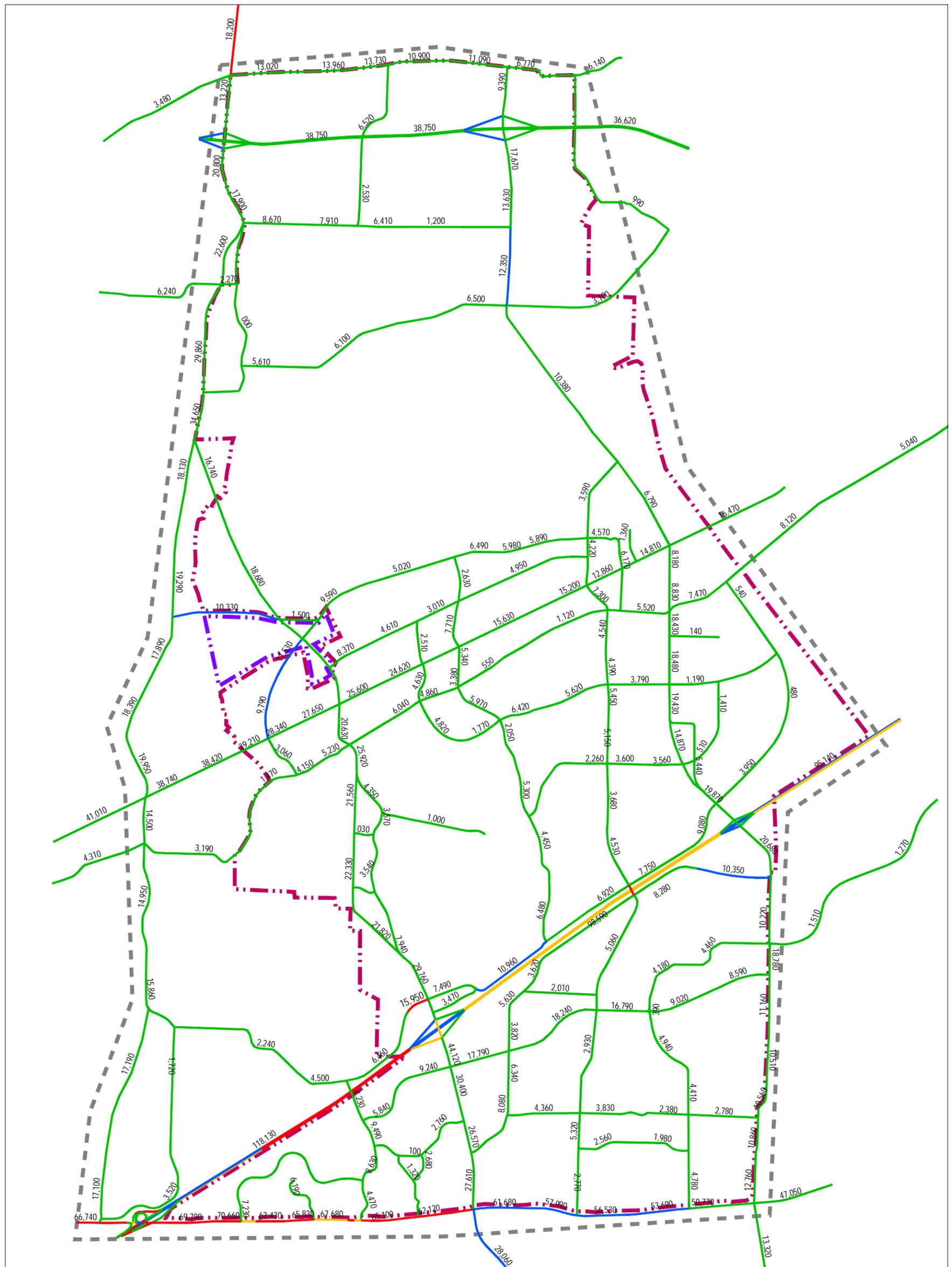
- | | |
|-------------------|-------------------------|
| Boundaries | Level of Service |
| --- City Limits | — LOS C or Better |
| --- Annex Reserve | — LOS D |
| --- Study Area | — LOS E |
| | — LOS F |
- 0 .33 .67 1
Miles

FIGURE 5
FULL BUILD-OUT HIGHWAY NETWORK
ALTERNATIVE 1

TRAFFIC VOLUME AND LEVEL OF SERVICE



Kimley-Horn and Associates, Inc.



LEGEND

Boundaries	Level of Service
--- City Limits	— LOS C or Better
--- Annex Reserve	— LOS D
--- Study Area	— LOS E
	— LOS F

0 .33 .67 1
Miles

FIGURE 6
FULL BUILD-OUT HIGHWAY NETWORK
ALTERNATIVE 2
TRAFFIC VOLUME AND LEVEL OF SERVICE



4.3 Comparison of Alternatives

As mentioned previously, there are two major differences between the roadway networks identified in Alternatives 1 and 2. The first difference is the new I-40 crossing location. In Alternative 1, Cobb Road extends northwest, crosses I-40 and ties into Seed Tick Road. In Alternative 2, Cobb Road extends northeast, crosses I-40 and ties into Lakeland Trace Road. In both alternatives, the new I-40 crossing is attractive to travelers and is anticipated to carry 14,000 to 15,000 average daily traffic under level of service D. Because a high volume of turning vehicles is expected on intersections north and south of I-40, exclusive left turn lanes for both directions is recommended. In alternative 1, the I-40 crossing at Seed Tick Road helps to relieve congestion at the Canada Road interchange. The anticipated traffic volume on Canada Road from the I-40 westbound ramps to Huff N Puff Road is 41,340 vehicles per day, which is 2,760 vehicles per day less than Alternative 2 (44,100 vehicles per day). However, Alternative 1 will attract approximately 2,300 more vehicles per day to Seed Tick Road.

The second difference in the two alternatives is the alignment of the Monroe Road extension to Chambers Chapel Road. In Alternative 1, Monroe Road extends east, then curves north following the edge of the power transmission line and follows the existing Monroe Road east to Chambers Chapel. In Alternative 2, Monroe Road extends east and ties into Chamber's Chapel at Sumac Road. Anticipated traffic volumes on the Monroe Road extension are slightly higher in Alternative 1; however, these roadways are anticipated to operate under level of service C or better with either alternative.

For both Alternatives 1 and 2, the section of Canada Road at I-40 is expected to operate with level of service E. Davies Plantation Road from Davies Plantation Road South to Canada Road is expected to operate with level of service E if it remains a two-lane road. The Chambers Chapel Road extension from Stewart Road to Salem Terrace Road will also operate with level of service D, as shown in Alternative 1 and 2.

5.0 PUBLIC INVOLVEMENT

Public involvement is an important and integral part of the Lakeland Major Road Plan update process. The purpose was to provide early and adequate opportunities for citizens and public officials to be involved in the plan update process. Two public meetings were held during the course of the project. The first meeting was held at the Lakeland Model development stage, before the deficiency analysis was conducted. The objective of the first meeting was to gather public input on establishing goals and objectives, identifying congestion and safety issues, and assess public access and mobility needs. Information gathered from the first public meeting was then used in the deficiency analysis and in the process of developing alternative solutions. The second public meeting was held at the end of the alternative analysis after the draft recommendations were complete. This meeting presented the alternatives and recommendations to the public and provided opportunities for the citizen to give comments on the recommendations. Public input/comments received and summary of the two public meetings can be found in **Appendix D**.

Public involvement for the Lakeland Major Road Plan Update reached out to all community members via Lakeland Citywatch, which is a newsletter of the Council of Lakeland Associations . For the second meeting, invitations were also mailed to each person who attended the first meeting. Both meetings were held at the Lakeland City Hall.

5.1 Public Meeting #1 – December 13, 2007

The first public meeting was organized as a workshop. The workshop provided a forum for community members to mark up maps, translating their ideas and values into shared goals and specific desired improvements. The first meeting began with an overview presentation during which the project team described the planning process and introduced background data including typical goals and objectives, the importance of planning land use and transportation together, and the concepts of complete streets and connectivity. Following the presentation, the participants divided into small groups led by the organizers for group discussions. A questionnaire was distributed with the following categories used to help guide the discussion:

- Goals and Objectives
- Current Issues
- Access and Mobility
- Safety
- Appearance/Pride
- Accessibility and Connectivity
- A Perfect Transportation System

The participants marked up maps identifying their concerns and recommendations for the transportation plan. The sign-in sheet showed the attendees, the complete questionnaire, and the summary of the responses are included in **Appendix D**.

5.2 Public Meeting #2 – June 17, 2008

The second public meeting was held on June 17, 2008 at the Lakeland City Hall. The presentation started with a brief introduction of the project, the planning process used, and the major road plan adoption process. The public comments and concerns from the previous public meeting were summarized and presented by category. The plan alternatives and the analysis results were explained and the major changes from the existing Lakeland Major Road Plan were highlighted. Draft recommendations for the plan were also presented to the public. A list of attendees, questions, comments, and responses are included in **Appendix D**.

5.3 Public Input and Plan Considerations

Public input received from the first public meeting varied from specific recommendations — such as specific safety issues on Highway 70 and Canada Road intersection — to more general comments regarding the need for connectivity and complete streets. A number of recurring themes that emerged from the first public meeting were consistent with the project vision, and were addressed in the recommended plan:

- **Preserve scenic corridors**

Maintaining scenic beauty of Lakeland was the top goal and objective desired by the public. Specifically three corridors were identified as scenic routes by the citizens in the meeting and need to be preserved. Consequently, Seed Tick Road, Memphis-Arlington Road, and Old Brownsville Road are recommended to stay as 2-lane road.

- **Complete Street with multimodal considerations, median and road side landscaping**

This recurring theme concerns both multimodal solutions and maintaining scenic beauty of the City. Although multimodal solutions are out of the scope of the Major Road Plan, the City is in the process of updating their development regulations. Bike and pedestrian features will be considered in the update process. The recommended plan does recommend divided highways for most of the 4-lane and 6-lane roadways in the city. Divided highways are generally more aesthetically pleasing, carry more traffic, have better access control, and are safer for all roadway users.

- **Congestion relief**

Providing adequate capacity for the future is one of the major goals of the Major Road Plan. The most prominent current congestion in Lakeland is the I-40 interchange at Canada Road. Except the short term and long term improvements that are already identified by the TIP and the LRTP, the recommended plan also included additional I-40 crossing at Lakeland Trace Road, which is desired by the public and will help relieve congestion on Canada Road.

- **North-South connectivity**

As requested by the public, the recommended plan proposed the following major improvements to enhance north-south connectivity:

- New I-40 crossing at Lakeland Trace Road,
- Canada Road extension to Brunswick Road,
- Lakeland Trace Road extension to Highway 70, and
- Chambers Chapel extension across the Loosahatchie River to Stewart Road.

Compared with the existing Major Road Plan, the number of lanes proposed on all three north-south corridors mentioned above are reduced. Minimizing number of lanes was another objective identified in the public responses.

- **East-West connectivity**

Citizens perceived that the City has a limited number of east-west routes. The recommended plan addresses this deficiency with the following recommended improvements:

- Monroe Road extension to Sumac Road as a 4-lane divided highway,
- New east-west route south of and parallel to I-40,
- Beverle Rivera Road extension to Chambers Chapel,
- Additional east-west collector streets between Beverle Rivera and Memphis-Arlington, and
- New east-west collector road between Highway 70 and Old Brownsville.

The additional east-west collector streets will help relieve future congestion on Old Brownsville Road and Memphis-Arlington Road, which will remain 2-lane scenic corridor.

Based on feedback and comments received from the second public meeting, the draft report was revised to include a more detailed comparison between the existing and recommended Major Road Plan. Prioritizing the proposed improvements is another important aspect of the plan as it aids in the plan's implementation. This topic is further discussed in Section 7.

6.0 SUMMARY AND CONCLUSIONS

This study documents the analysis, findings, and recommendations for planned roadway improvements and the traffic impacts resulting from the existing and proposed future land use in the City of Lakeland. As a part of this study, a subarea travel demand model was developed for the City of Lakeland based on the official Memphis MPO Travel Demand Model. Traffic volumes in the full build-out of the City were forecasted using the Lakeland Model and the deficiencies were analyzed. Two roadway improvement alternatives were identified and analyzed. Recommendations for improvements to provide for acceptable traffic operations were developed. A roadway segment Level of Service (LOS) analysis was used to determine the ability of the planned roadway network to efficiently accommodate projected average daily traffic (ADT) volumes based on the number of travel lanes and other roadway characteristics.

Based on the alternative analysis discussed in Section 4, the following are specific roadway recommendations:

- Provide a 4-lane divided roadway for Davies Plantation Road from Davies Plantation Road South to Canada Road.
- Provide a 4-lane undivided roadway for Beverle Rivera Road from Canada Road to Chambers Chapel Road. Although a 2-lane highway is capable of accommodating the forecasted traffic volume on Beverle Rivera Road, the recommendation of 4-lane undivided roadway is made based on the fact that the Chambers Chapel Interchange at I-40 and other proposed improvements are not likely to be constructed in the near future.
- Provide a new I-40 crossing at Lakeland Trace Road (as shown in Alternative 2) to reduce the impact on Seed Tick Road as a scenic corridor and the intersection of Beverle Rivera and Canada Road. A 4-lane cross over bridge is recommended to provide for a through lane and an exclusive left turn lane for each direction.
- The alignment of Monroe Road extension to Sumac Road (as shown in Alternative 2) is recommended to improve connectivity for the area south of Monroe Road, and

- Although it is recommended that the section of Chambers Chapel Road from Stewart Road to Salem Terrace Road be constructed as 2-lanes, it is recommended that the City reserves enough right-of-way to provide for a 4-lane divided road.

Recommended improvements were developed based on maintaining a balance between obtaining an acceptable LOS (C or better) and other constraints along roadways in the study area while meeting the intent of the Transportation Goals and Objectives established as part of the project. This resulted in a recommended roadway network which includes some roadways that are not projected to meet the LOS C or better criteria, but instead are in keeping with the character of roadways desired for Lakeland.

The capacity and LOS analysis conducted assumed that all existing or proposed 2-lane roadway are undivided. Capacity of a divided 2-lane roadway is up to 20% higher than an undivided 2-lane roadway. Consequently, constructing the planned 2-lane roadway with a median will result in better level of service, and should be considered in conjunction with other land use planning and context sensitive design factors.

Figure 7 illustrates the recommended Transportation Plan. This plan is most similar to Alternative 2. The differences as reflected in this section are:

- Provide for a 4-lane divided roadway for Davies Plantation Road from Davies Plantation Road South to Canada Road,
- Provide a 4-lane undivided roadway for Beverle Rivera Road from Canada Road to Chambers Chapel Road, and
- Provide for a 4-lane bridge for a new I-40 crossing at Lakeland Trace Road

Table 6 identifies the differences between the recommended transportation plan and the existing Major Road Plan.

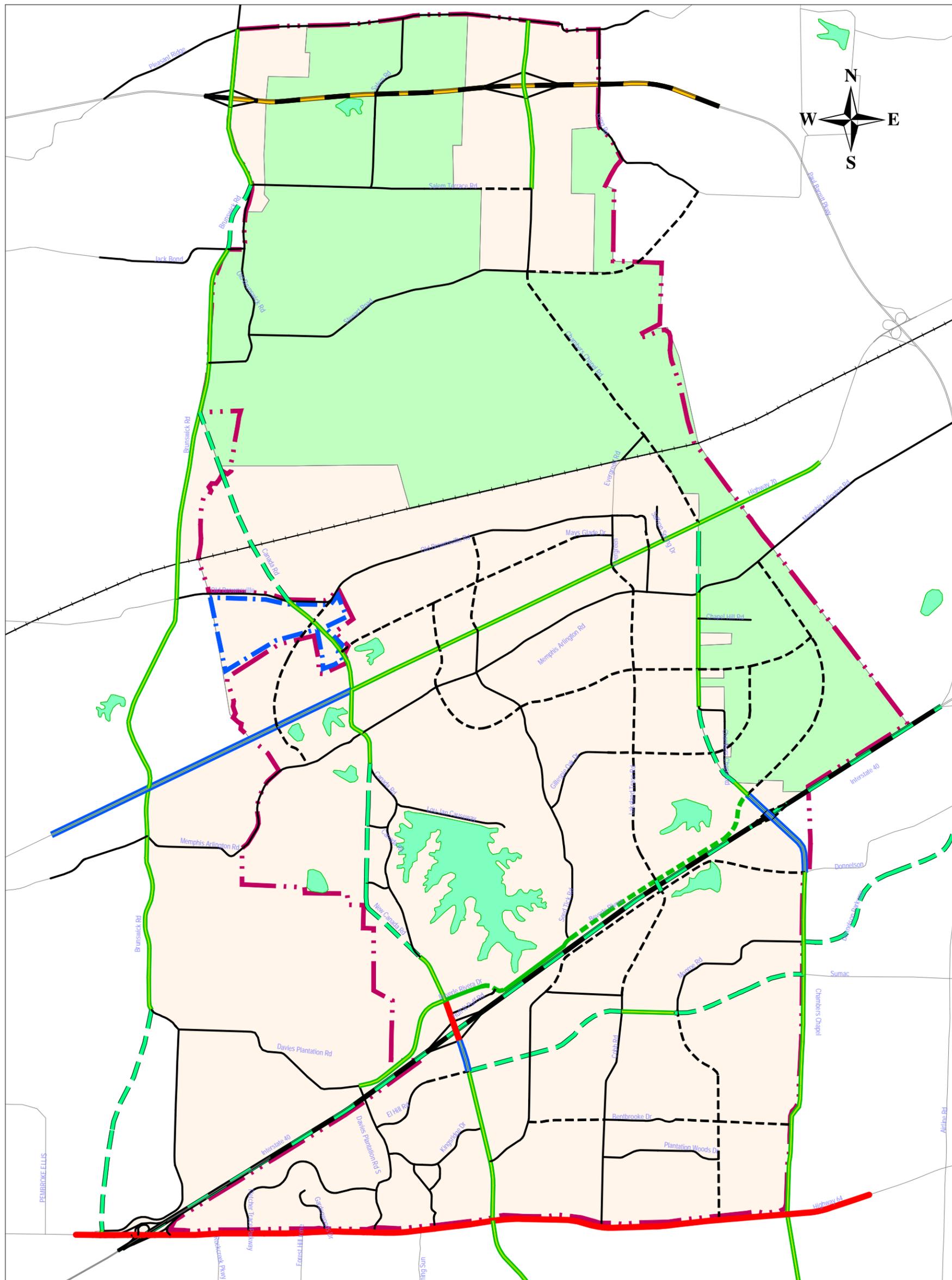


FIGURE 7 RECOMMENDED TRANSPORTATION PLAN
Boundaries

- City Limit
- - - Annex Reserve Area
- 2-Lane Roadway
- 4-Lane (Undivided)
- 4-Lane (Divided)
- 6-Lane (Divided)
- 7-Lane (TWLTL)
- - - Future 2-Lane Roadway
- - - Future 4-Lane (Undivided)
- - - Future 4-Lane (Divided)
- Rural
- Urban



Table 6 - Summary of Major Differences Between Existing Major Road Plan and The Recommended Plan Update

Route	Location	Existing Major Road Plan	Recommended Plan Update
Alternative I-40 Crossing	Cobb Rd extension to north	None	Crossing I-40 and tie into Lakeland Trace Rd
Beverle Rivera Rd	Canada Rd to Chambers Chapel	4-lane roadway, terminates at Lakeland Trace Rd	4-lane (undivided), extends to Chambers Chapel
Canada Road	Davies Plantation Rd to Old Canada Rd	6-lane roadway	4-lane (divided)
Canada Road	Highway 64 to El Hill Rd	6-lane roadway	4-lane (divided)
Chambers Chapel Road	Highway 70 to Salem Terrace Rd	4-lane roadway	2-lane (undivided)
Chambers Chapel Road	Sumac Rd to Donelson Rd	6-lane roadway	4-lane (divided)
Davies Plantation Rd	Davies Plantation Rd South to Canada Rd	4-lane roadway	4-lane (divided)
Davies Plantation Rd South	Highway 64 to Davies Plantation Rd	4-lane roadway	2-lane (undivided)
El Hill Rd Extension	Davies Plantation Rd South to Canada Rd	4-lane roadway	2-lane (undivided)
Highway 70	Brownsville Rd to Canada Rd	4-lane roadway	6-lane (divided)
Loosahatchie Parkway	Brownswick Rd to Evergreen Rd	2-lane roadway	Removed
Memphis Arlington Rd	Canada Rd to Seed Tick Rd	4-lane roadway	2-lane (undivided)
New E-W road north of Highway 70	Canada Rd to Chambers Chapel	None	New 2-lane road
New E-W road south of Memphis Arlington Rd	Seed Tick Rd to Chambers Chapel and east	None	New 2-lane road
New road south and parallel to I-40	Monroe Rd to Chambers Chapel	4-lane roadway	2-lane (undivided)
Old Brownsville Rd Extension	Canada Rd to Memphis Arlington Rd	None	New 2-lane road
Salem Terrace Rd	Brunswick Rd to Stewart Rd	4-lane roadway	2-lane (undivided)
Seed Tick Rd	Memphis-Arlington Rd to Highway 70	4-lane roadway	2-lane (undivided)

City of Lakeland
Special Area Transportation Study

During the course of this study, the MPO was in the process of updating the Transportation Improvement Program (TIP) and the Long Range Transportation Plan (LRTP). The projects that are identified in the final 2008 – 2011 TIP and the 2030 LRTP are listed in Table 7. These projects were included in the alternative analysis of this study.

Table 7 - MPO Planned Roadway Improvements

Route	Location	Improvements	MPO Plan	LRTP NO.	TIP NO.	Funding Year
I-40	Canada Rd Interchange	Signalization on existing interchange	TIP 2008-2011	-	CMAQ-2002-09	2011
I-40	Canada Rd Interchange	Reconstruct interchange	TIP 2008-2011	60020001	NHS-2002-04	2012
Canada Rd	Highway 70 Intersection	Signalization	TIP 2008-2011	-	STP-M-2006-01	2011
Canada Rd	I-40 to Highway 70	4-lane with 6 lane ROW	TIP 2008-2011	-	STP-M-2006-01	2011
Highway 64	I-40 to Canada Rd	6-lane divided roadway	LRTP 2030	01320021 - 01320023	-	2020
I-40	Highway 64 to Canada Rd	Extend HOV lanes beyond Canada Road	LRTP 2030	1040017	NHS-2006-10	2020
I-40	Highway 64 Interchange	Reconstruct Interchange	LRTP 2030	60020003	-	2020
Brunswick Rd	Highway 70 to Navy	4-lane roadway	LRTP 2030	00950002, 00950004	-	2030
Highway 64	Canada Rd to Cherry Rd	6-lane divided roadway	LRTP 2030	01320024 - 01320028	-	2030

7.0 ADDITIONAL CONSIDERATIONS

As identified in the 2004 Lakeland Transportation Improvement Study, additional policies and guidelines should be established to help the City of Lakeland achieve its community goals. The following is a list of policies to be considered for implementation by the City of Lakeland.

- Access Control Policy
- Traffic Impact Study requirements to determine potential traffic impact of development
- Roadway right-of-way dedication requirements for developing properties
- Roadway improvement or payment in-lieu-of-improvement policy based on traffic impacts
- Consistency requirement – the transportation system and Land Use must be compatible. A policy should be considered to resolve inconsistencies created between the two by land use changes before development is allowed to proceed.

The implementation of policies to clarify the City's position on these issues will provide the development community with information vital to the successful development of their properties, will assure there are no surprises to the developers or other citizens of Lakeland, and will help to provide orderly growth of the community.

Similar to most of the transportation planning documents, the value of this transportation study occurs with the implementation of the plan. In order for the plan to be implemented, several steps and actions must be taken. After the approval and adoption of the transportation plan by the City, typical roadway cross sections for each roadway type should be defined. These typical sections should define the pavement widths and depths, and the roadside treatments (such as rural cross section with open ditch vs. curb and gutter with sidewalk). As part of the City's ongoing process of updating the development regulations, typical section and street type designation are being developed by the City. After the update process is finished, it is recommended that the final typical section and street type designation to be reviewed to ensure compatibility with the Major Road Plan and other applicable engineering design standards.

The planned roadway improvements within the City of Lakeland should be prioritized. The City will be able to use that list to define a capital improvements program and to work with the Metropolitan

Planning Organization and the State of Tennessee to obtain funding for roads that are important to the City of Lakeland. This prioritized list can also be used to determine the improvements that will be required to support developing properties. From these efforts, the City will be able to establish time frames for the implementation of the projects identified in this study.

It must be emphasized that this study and the resulting Transportation Plan are not static documents. As the City of Lakeland continues to develop, there will be changes proposed to Land Use Plan that merit consideration. Because the Transportation Plan and Land Use Plan must be compatible, it is imperative that the transportation impacts of those land use changes be considered before the decisions are made to change the Land Use Plan. Then, if the land use changes are approved, the Transportation Plan must be updated to correspond to those changes. Therefore, both the Land Use Plan and Transportation Plan must be considered dynamic documents. Recognizing that it is not necessary to re-examine the entire plan with every minor change in land use that may occur, it is recommended that the Transportation Plan be reviewed at least annually to incorporate the minor land use changes.

Although the study assumed full build-out for the City of Lakeland, the demographic and economic characteristics for the rest of the region are only forecasted to year 2030. In addition, roadway network improvements that are beyond the horizon year 2030 were not included in the study. If there are major land use changes or significant roadway capacity improvements in the adjacent cities, the Transportation Plan should be reviewed and updated.

Another consideration is to maintain compatibility of the Lakeland Major Road Plan with the MPO's major planning documents, such as TIP, LRTP and the MPO's Major Road Plan. The recommended Plan is compatible with the 2008-2011 TIP and the 2030 LRTP. The MPO's current Major Road Plan was initially adopted in 1994 and there are inconsistencies between this document and the proposed Lakeland plan. **Table 8** below identifies the projects in the existing MPO Major Road Plan within the Lakeland Area. The MPO is planning to update its Major Road Plan in late 2008 or early 2009. It is strongly encouraged that the City of Lakeland actively participate in the MPO's Major Road Plan update process to incorporate the Lakeland Major Road Plan into the MPO's Plan and to coordinate with adjacent cities to maintain consistent cross section on major arterials and resolve differences.

Table 8 – Projects in MPO’s Existing Major Road Plan

Route	Location	Improvements
Canada Rd	Highway 64 to Highway 70	7-lane roadway
Canada Rd	Highway 70 to SR-385	5-lane roadway
Chambers Chapel Rd	Highway 64 to SR-385	6-lane divided
I-40	Canada Rd to Airline Rd	6-lane Interstate

As discussed in the second public meeting, the impact of the proposed Harding Academy development north of Highway 70 on the recommended plan will be evaluated by another study.

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

Technical Memorandum #1 City of Lakeland Base Year (2004) Travel Demand Model Development

This memorandum details the base year (2004) subarea travel demand model development for the City of Lakeland.

Contents

Introduction

Refinement of Traffic Analysis Zone Structure

- *Overview*
- *TAZ Refinement Criteria*
- *Process*
- *Results*

Highway Network Development Methodology

- *Overview*
- *Network Data Collection and Attributes Coding*
- *Network Correction*
- *Centroid Connectors*

Base Year Household and Employment Data Preparation

- *Household Data Collection*
- *Employment Data Breakdowns*

Base Year Model Validation and Performance Review

- *Traffic Counts Collection*
- *Traffic Assignment Validation Criteria*
- *Model Performance Review*

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

Introduction

As part of the Lakeland Major Road Plan Update process, Kimley-Horn and Associates, Inc. (KHA) developed a subarea travel demand model to forecast the full build-out traffic in the study area. The Lakeland Subarea Model is based on the official version of the Memphis MPO Travel Demand Model (the Regional Model) developed and approved in 2007. Because the Regional Model mainly focused on arterial roadways in the entire region, it has insufficient granularity on both traffic analysis zones (TAZs) and highway network in Lakeland area. To forecast the full build-out traffic more accurately in the Lakeland area, a base year (2004) model needed to be developed and validated. TAZs and associated demographic and economic data also had to be refined. More roadways that are significant in the Lakeland area had to be added to the highway network. The traffic assignment results need to be compared with the collected traffic counts to evaluate the model performance. This Memorandum details the base year (2004) subarea model development process.

Refinement of Traffic Analysis Zone Structure

Overview

The Regional Model consists of 13 TAZs in the study area. Figure 1 shows the existing regional TAZ boundaries. This is approximately one zone per 1.88 square land miles. The TAZ density is sufficient for the Regional Model, but not sufficient to capture the future land use and development of the Lakeland area. The TAZ refinement process was comprehensive as it involved the establishment of guidelines or criteria and input from the City.

TAZ Refinement Criteria

In developing and refining the new TAZ structure for the Lakeland subarea model, several guidelines and criteria were established as a basis for development. For example, zones were developed that are homogenous with respect to land use and socioeconomic data. Whenever possible, zone boundaries followed physical and natural geographic features. Finally, census tract, census block group, and even census block geography boundaries were followed to the extent possible to allow for easy access to census data.

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

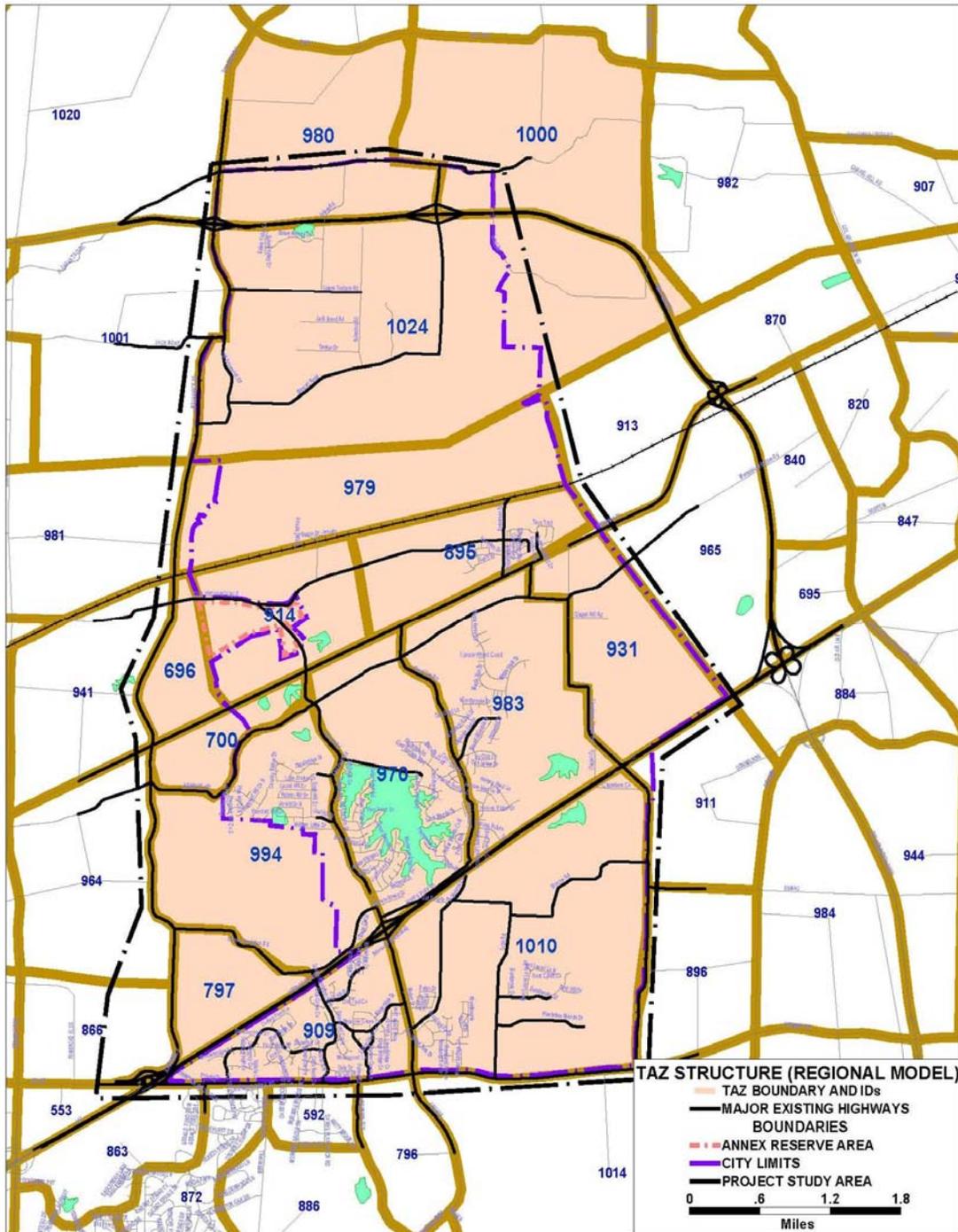


Figure 1 Existing TAZ Structure (Regional Model)

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

Traffic analysis zone development and modification was influenced by the following criteria:

- Geographic features such as rivers, streams, and lakes.
- Existing and Planned Transportation facilities
- TAZ boundary configuration consistent with census tract boundaries and census block groups in rural/suburban areas
- Consistent land uses across the zone as much as possible
- Evaluation of existing land uses and zoning
- Cross reference with an evaluation of the future land use plan
- Configuration will be consistent with the available transportation network/infrastructure serving the zone
- Configure zones and zonal boundaries such that trips can be loaded appropriately (meaning that we will load the proper roadway functional classification) to the internal transportation network within the TAZ itself.

In the development of the new Lakeland TAZ structure, these criteria or guidelines were followed to the extent possible but not without some variation. To accommodate the rapid growth in the study area, TAZs are generally split into smaller geographic areas than the provided Census Block boundaries. There were also locations where the shape or configuration of the TAZ was illogical in relation to roadway network access or land development. In such cases these zones were either split or combined with adjacent zones to provide a more desirable zone structure.

Additionally, throughout the process TAZ boundary locations were evaluated relative to infrastructure, right-of-way, geographic features, land uses and future land use planning. Socio-economic data by census tract and census block group (where applicable) along with existing land use and future land use maps, model network area coverage, and necessary aerial photography were all used in determining the need for splitting, realigning, or adding additional TAZs.

Process

The process began using the existing TAZ structure from the regional model and identifying additional zonal needs in the study area. Much of the regional TAZ structure was based on a combination of census tract, census block group, and in some cases census block boundaries. By overlaying the regional TAZ structure with the geographical features and the new Lakeland Land Use Plan, current large blocks with inconsistent internal land uses were identified and split. Future planned roadways and new planned developments were then evaluated to make sure that the TAZs will not be divided by major future roadways. The new TAZ structure was then reviewed internally by KHA staff.

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

The TAZ structure was then reviewed by the City in the Project Meeting #1.

Results

The expanded and refined TAZ structure now consists of 50 internal zones and covers approximately 24.4 square miles. This is approximately one zone per 0.49 square land miles, a relatively dense zonal structure for a suburban area such as Lakeland. The new TAZ structure will allow enough granularities to capture the full build-out land use, zoning, and new future roadways.

A map showing the new TAZ boundaries with other geographic features is shown in Figure 2.

Highway Network Development Methodology

Overview

The highway network carried over from the regional model does not include some of the minor collector roads, feeder roads, and local roads that are not significant in the regional model. By reviewing the regional roadway network, a set of such roads were identified and added to the Lakeland model network. These roads generally carrying relatively higher traffic volume and provide necessary connectivity in the Lakeland area.

Network Data Collection and Attributes Coding

The highway network database in the model contains attributes for each link in the line layer in TransCAD. This layer contains all of the necessary attributes for proper modeling of each of the roadways in the model, including roadway speeds and capacities. For all the additional roadways identified in this step, these attributes have to be coded correctly. This information was collected directly from the City of Lakeland in GIS format. Information from other sources such as the Tennessee Department of Transportation TRIMS database and the latest aerial photography are also used in the development process. The attributes recorded and coded during the data collection effort included:

- Posted Speed Limit
- Area Type (CBD, Urban, Rural, Suburban)
- Median Treatment (No Median, Divided, Two-Way Left Turn Lanes)

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

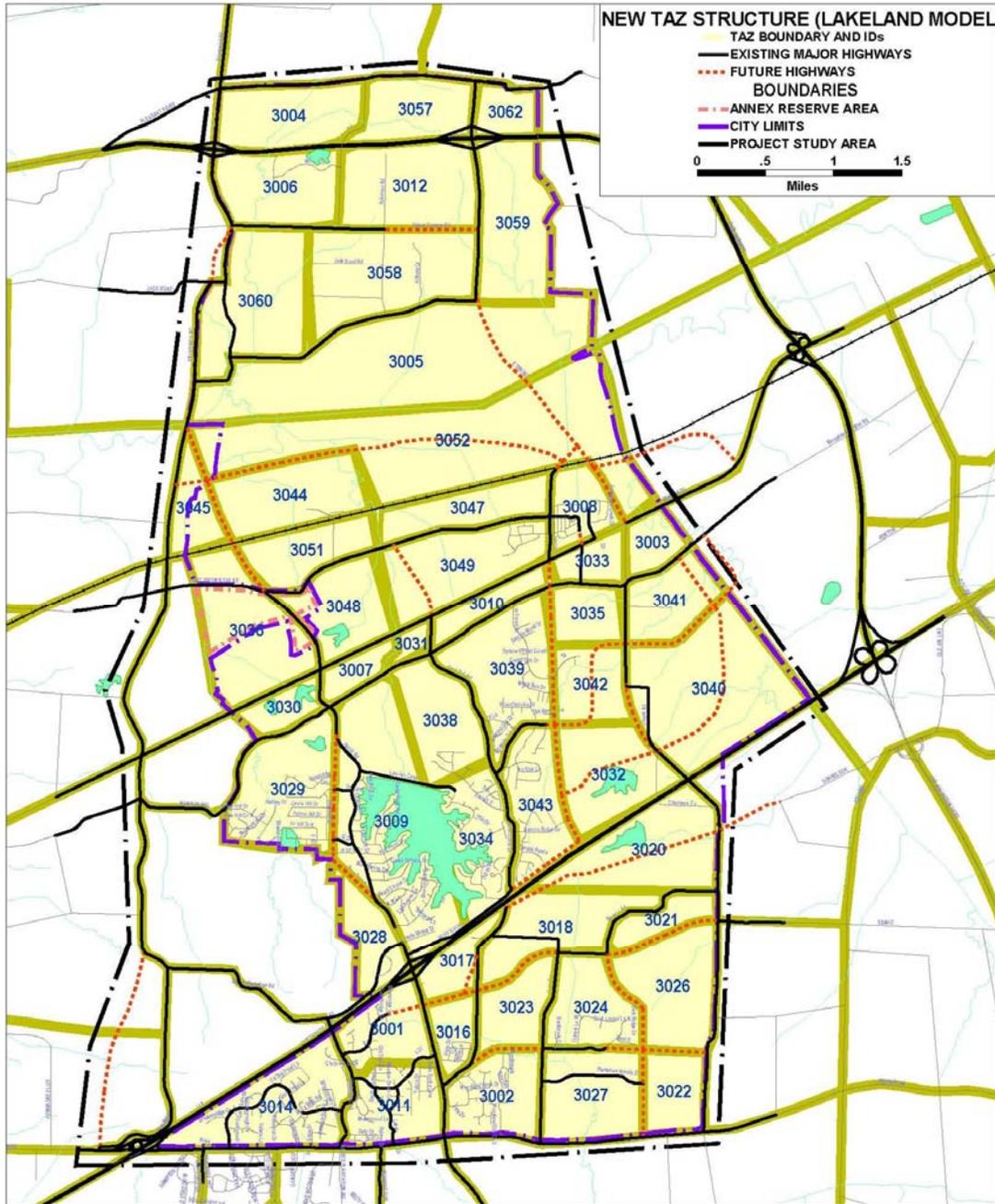


Figure 2 Refined TAZ Structure (Lakeland Model)

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

- Roadway Functional Classification (Interstate, Other Freeway, Principal (Major) Arterial, Minor Arterial, Collector, Local)
- Through Lanes per Direction
- Average Lane Width by Direction
- Average Shoulder Width by Direction

Network Correction

The geographic centerlines of the additional roadways were merged to the network from the GIS layer provided by the City. As a part of the network development process, corrections and quality checks were made to the TransCAD network. Corrections made to the network include the following:

Verified roadway alignments and termini

The network was “cleaned” to aerial photography where some roads were misaligned. The Kimley-Horn team also verified necessary modifications to roadway links to provide for representative conditions.

Repaired fragmented roadway links

Many links (roadway sections between intersection nodes) consisted of multiple individual fragments. This increases the likelihood of disconnected roadways, which increases file size and causes traffic assignment problems. Using TransCAD’s map editing tools, the Kimley-Horn team combined fragmented roadway segments into continuous links between intersection nodes.

Modified disconnected intersection nodes

Some nodes in the centerline mapping were not properly aligned at as-built intersections. Using TransCAD’s map editing tools, the Kimley-Horn team reviewed and properly connected intersecting roadways.

Centroid Connectors

Additionally, with the completion of the TAZ structure and the Lakeland model network, centroid connectors for each TAZ were then coded into the model network. The purpose of the centroid connectors is to load the trips from the centroid of a TAZ to the highway network. As a part of this process, the latest aerial photography was used to ensure that the centroid connectors represent the actual access path of travel as close as possible.

Figure 3 shows the base year highway network with existing laneage information.

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

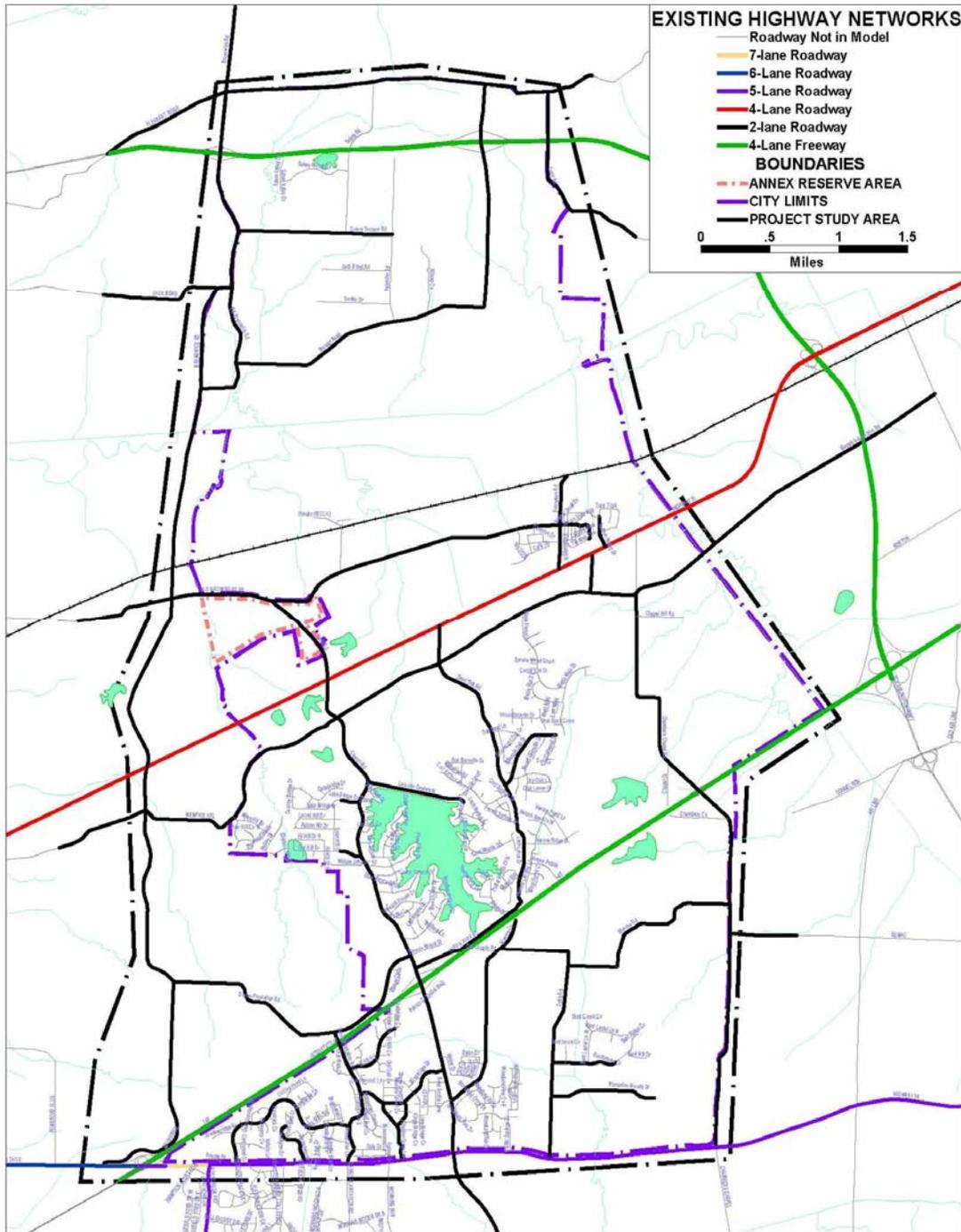


Figure 3 Base Year Highway Network (Lakeland Model)

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

Base Year Household and Employment Data Preparation

Household Data Collection

To get more accurate household distribution, the number of households in base year for each TAZ was counted from the aerial photography and the 2006 parcel data GIS files from Shelby County. The numbers from the regional model were also used if the aerial photo did not provide enough details. The household distribution by household size, person, worker, and age were carried over directly from the regional model.

Employment Data Breakdowns

The employment distribution from the regional model was also carried over to the Lakeland model. For cases where split zones occur, the new distribution was adjusted based on the "City of Lakeland Commercial Property Map" provided by the City.

Figure 4 shows the base year household and employment distribution in terms of total number of household and employment for each TAZ.

Base Year Model Validation and Performance Review

Traffic Counts Collection

To validate the assigned traffic volume against the observed traffic counts in base year, KHA collected 24-hour traffic counts in the study area from the ADAM traffic monitoring database system maintained by Tennessee Department Transportation. In addition, some traffic counts conducted during the previous Lakeland Major Road Plan update was used as supplement data. All counts used were consistent with the base year 2004. In a couple of occasions where the 2004 counts were not available, 2003 or 2005 was used instead. A total of 20 counts were collected and used in the validation process.

Traffic Assignment Validation Criteria

Since the Lakeland Model is based on the regional travel demand model, all criteria used to validate the regional model were reviewed in the development

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

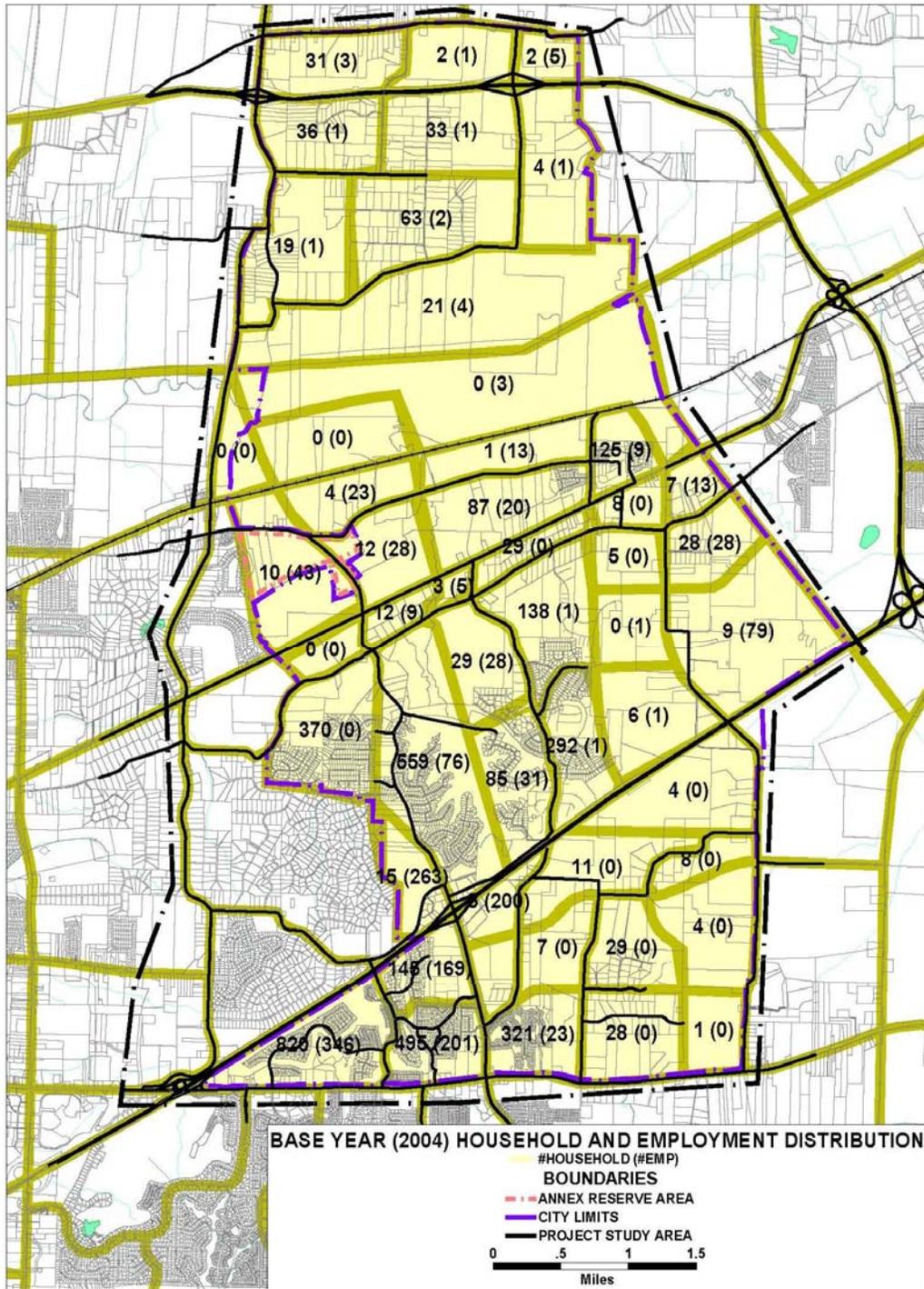


Figure 4 Base Year Household and Employment Distribution

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

process. The validation criteria used in the regional model includes:

- VMT by functional classifications
- Traffic volume by functional classifications
- Traffic volume by daily volume groups
- Percent of links within a specified percent of counts
- Screenlines and cutlines validation

These criteria were revisited for the Lakeland model and the results showed that the Lakeland model still met all the validation criteria defined in the regional model. For more details on these validation procedures, refer to "Technical Memorandum #9 – Validation Procedures" of the regional model documentation.

For the link level loadings in Lakeland area, the traffic counts collected in the previous step were compared against the assigned model volume for the base year 2004. To measure the forecasting accuracy, the percentage of links within a specified range of counts was calculated. Table 1 shows the criteria used in the regional model for this validation step. Since there are not enough counts to support validation by functional classification for the Lakeland area, all locations are compared collectively instead. The criteria used for Lakeland area are:

- 75% of the links need to be within 20% of the counts
- 50% of the links need to be within 15% of the counts

Table 1. Percent of Links within a Specified Percent of Count by Functional classification

Functional classification	Target within Count	Range Compared to Counts
Freeway	75%	20%
Freeway	50%	10%
Major Arterial	75%	30%
Major Arterial	50%	15%
Minor Arterial	75%	40%
Minor Arterial	50%	20%

Note: Table 4 can be read as "75% of the freeway links need to be within 20% of counts, 50% of the freeway links need to be within 10% of counts".

Lakeland Special Area Transportation Study

City of Lakeland, Tennessee

It should be noted that the criteria used for Lakeland is more rigorous than the regional model, since highways with lower functional classification are generally more difficult to match the counts.

Model Performance Review

The comparison of base year model volume and counts shows that 75% of the links in the Lakeland area are within 20% of the counts, and 70% of the links in the Lakeland area are within 15% of the counts. The results show that the base year model results met the first goal of 75% links within 20% of the counts, and are substantially better than the second goal of 50% links within 15% of the counts. Overall, the model assignment results are reasonable and satisfactory.

Table 2 shows the detailed comparison between model volume and counts on each counts location.

Lakeland Special Area Transportation Study

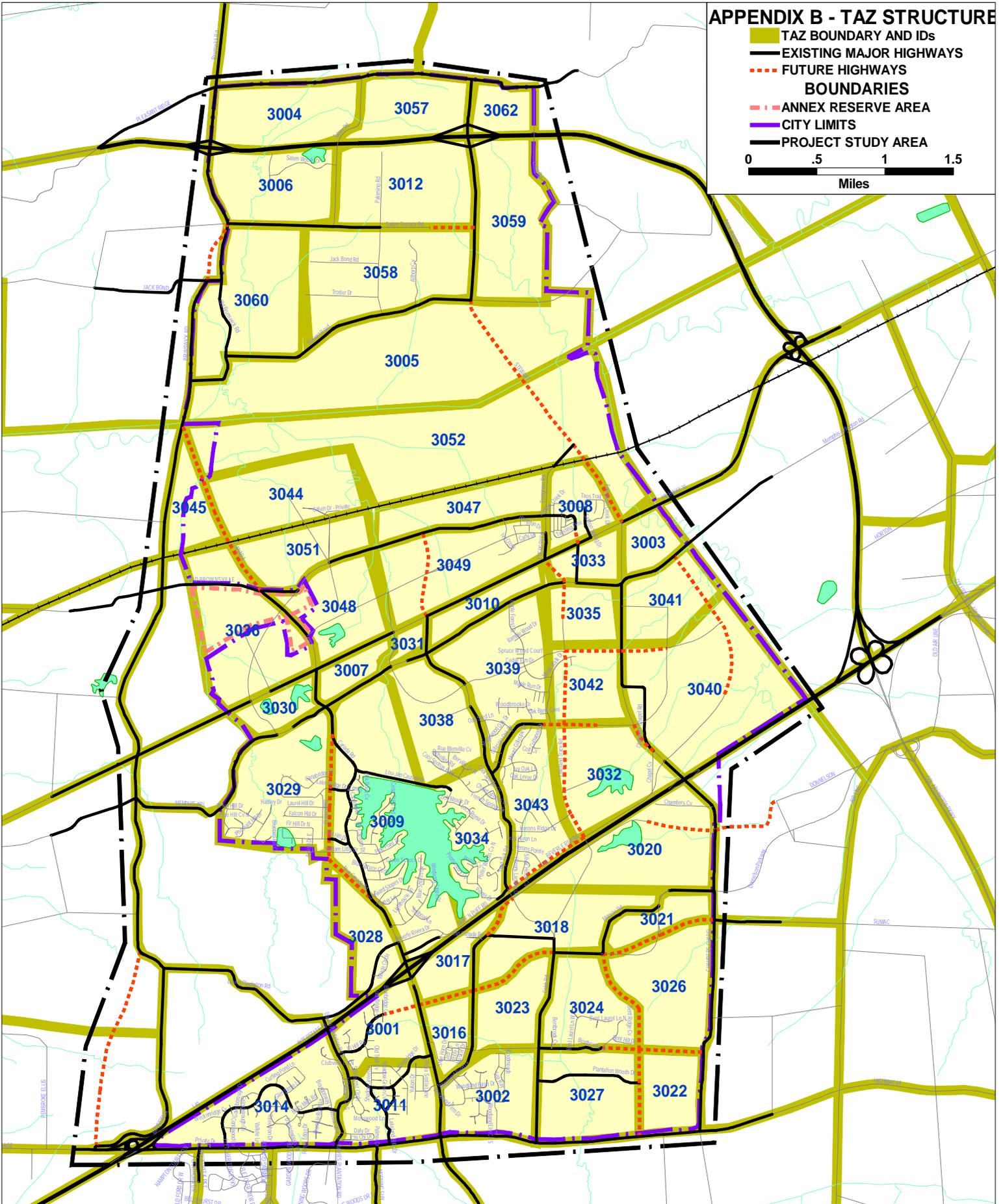
City of Lakeland, Tennessee

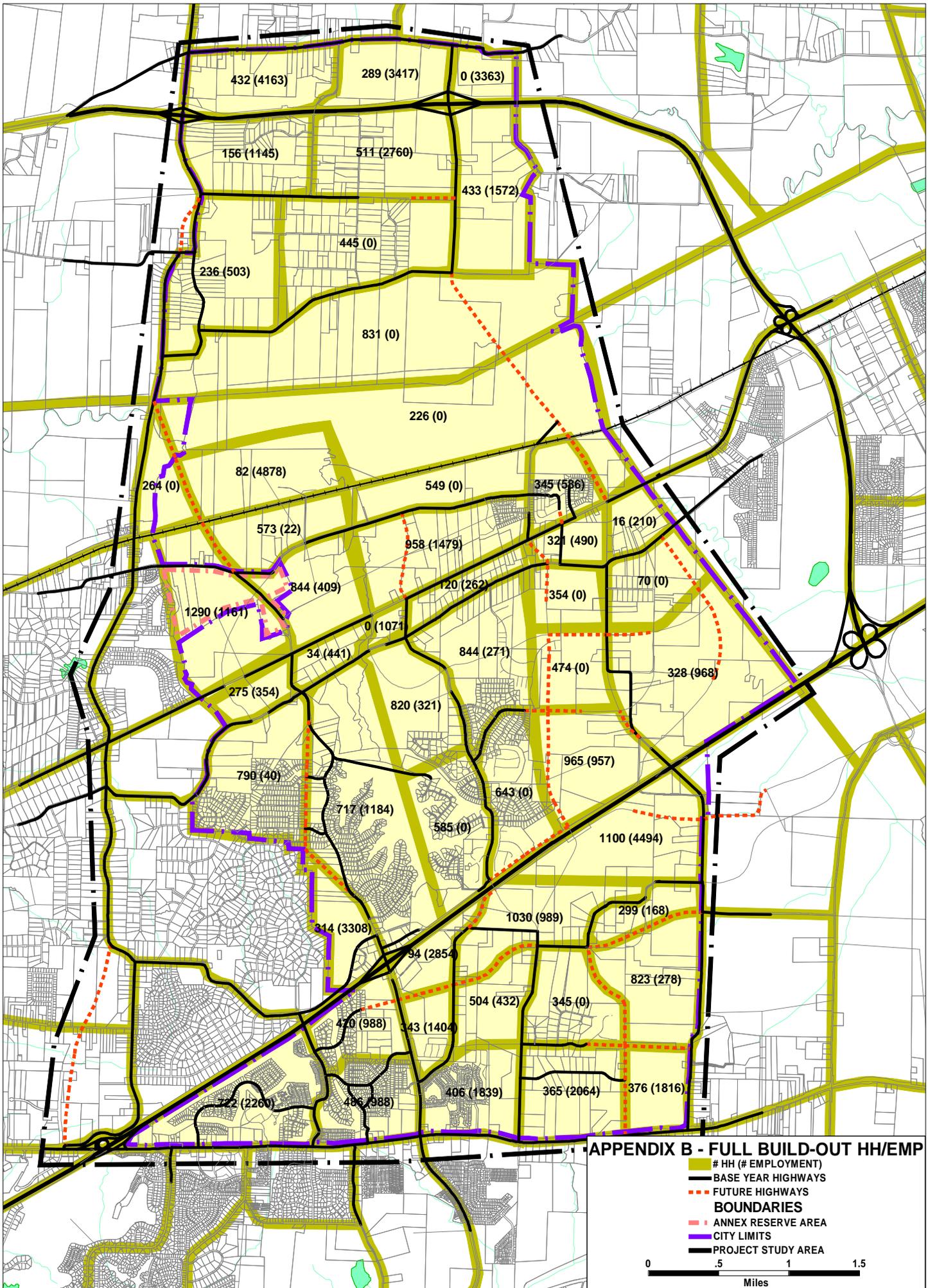
Table 2: Base Year 2004 Model Volume Compared with Actual Traffic Counts

Counts Index	Roadway Name	Location Description	Functional Classification	Counts	Model ADT	Error (%)
1	I-40 WB	Between Hwy 64 and Canada	Interstate	28877	30303	4.9
2	I-40 WB	Between Chambers Chapel and SR-385	Interstate	21444	26758	24.8
3	I-40 EB	Between Hwy 64 and Canada	Interstate	25124	30979	23.3
4	I-40 EB	Between Chambers Chapel and SR-385	Interstate	22296	26865	20.5
5	PAUL BARRETT EB	Between Salem and Stewart	Other Freeway	4162	3941	-5.3
6	PAUL BARRETT EB	Between Stewart and Hwy 70	Other Freeway	4454	4094	-8.1
7	PAUL BARRETT EB	Between Hwy 70 and I-40	Other Freeway	6180	6887	11.4
8	PAUL BARRETT WB	Between Salem and Stewart	Other Freeway	4162	3761	-9.6
9	PAUL BARRETT WB	Between Stewart and Hwy 70	Other Freeway	4454	3937	-11.6
10	PAUL BARRETT WB	Between Hwy 70 and I-40	Other Freeway	5824	5124	-12.0
11	HIGHWAY 64	Between I-40 and Rockcreek Pky	Major Arterial	45197	42284	-6.4
12	HIGHWAY 70	West of Canada Rd	Minor Arterial	7862	8138	3.5
13	HIGHWAY 70	East of SR-385	Minor Arterial	9199	11933	29.7
14	CANADA	South of I-40	Minor Arterial	10736	9505	-11.5
15	CANADA	North of Davies Plantation	Major Collector	6225	5588	-10.2
16	Memphis-Arlington Rd	East of Chambers Chapel	Major Collector	750	656	-12.5
17	BRUNSWICK	Between Davies Plantation and I-40	Collector	3448	3736	8.4
18	BRUNSWICK	Between Old Brownsville and Hwy 70	Collector	6785	8256	21.7
19	Davies Plantation Rd S	Between Kingsridge Dr and Fletcher Trace Pky	Minor Collector	3498	2880	-17.7
20	Seed Tick Rd	Between Oak Seed Ln and Gillespie Oak Dr	Minor Collector	1300	1199	-7.8

APPENDIX B - TAZ STRUCTURE

- TAZ BOUNDARY AND IDs
 - EXISTING MAJOR HIGHWAYS
 - FUTURE HIGHWAYS
- ### BOUNDARIES
- ANNEX RESERVE AREA
 - CITY LIMITS
 - PROJECT STUDY AREA
- 0 .5 1 1.5
Miles





432 (4163) 289 (3417) 0 (3363)

156 (1145) 511 (2760) 433 (1572)

445 (0)

236 (503) 831 (0)

226 (0)

82 (4878) 549 (0) 345 (586)

264 (0) 573 (22) 958 (1479) 321 (490) 16 (210)

844 (409) 120 (262) 354 (0) 70 (0)

1290 (1161) 0 (1071) 844 (271) 474 (0) 328 (968)

34 (441) 275 (354) 820 (321) 965 (957)

790 (40) 717 (1184) 643 (0) 1100 (4494)

314 (3308) 1030 (989) 299 (168)

94 (2854) 823 (278)

470 (988) 43 (1404) 504 (432) 345 (0)

722 (2260) 486 (988) 406 (1839) 365 (2064) 376 (1816)

APPENDIX B - FULL BUILD-OUT HH/EMP

- # HH (# EMPLOYMENT)
- BASE YEAR HIGHWAYS**
- - - FUTURE HIGHWAYS
- BOUNDARIES**
- - - ANNEX RESERVE AREA
- - - CITY LIMITS
- PROJECT STUDY AREA



Appendix B - Full Build-out Demographic and Economic Forecasts by TAZ

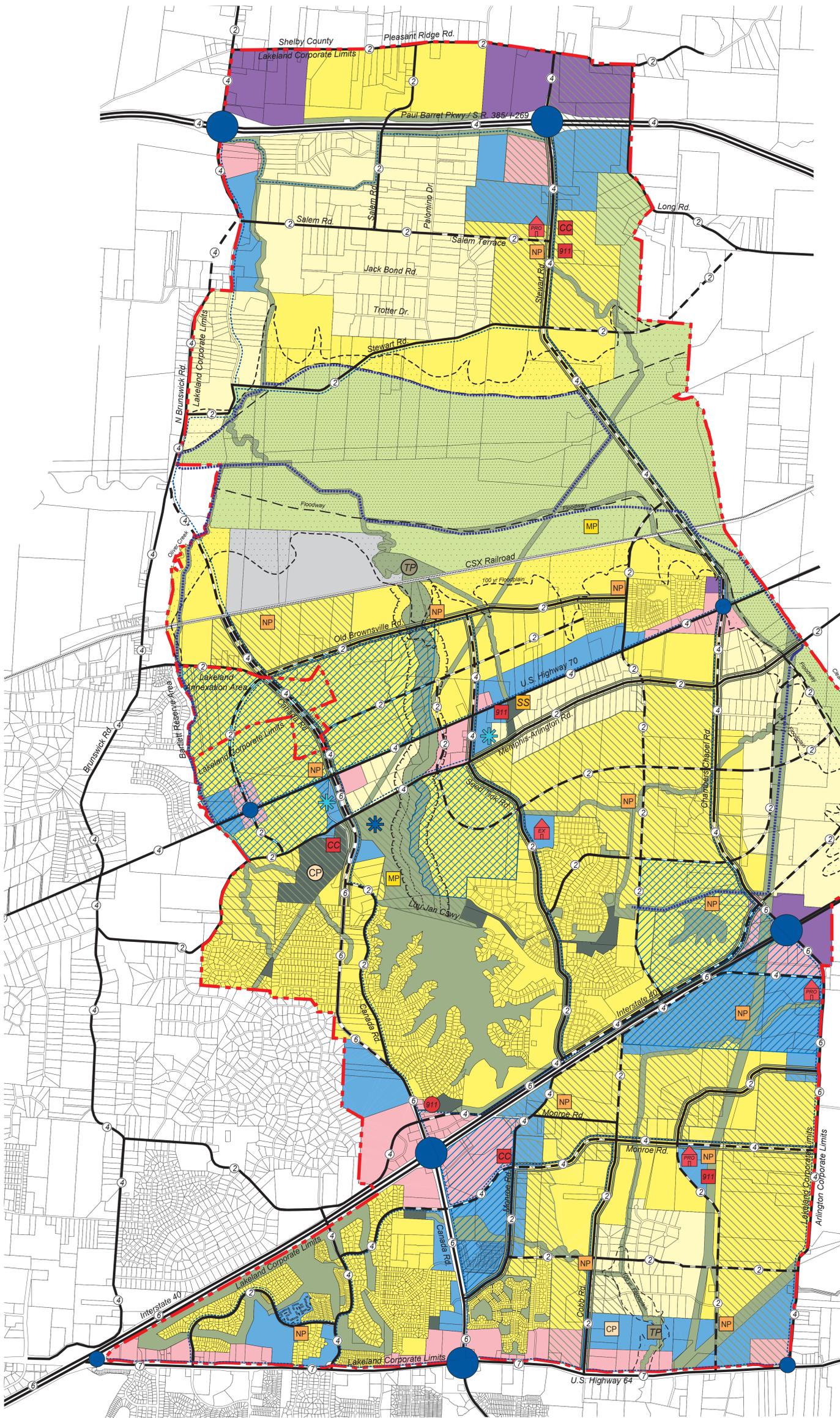
TAZ ID	Area (sq. mi)	Population	Number of Household	Number of Employment				School Enrollment
				Retail	Industrial	Office	Total	
3001	0.34	1078	420	452	0	536	988	0
3002	0.41	1043	406	965	0	874	1839	0
3003	0.17	45	16	110	0	100	210	0
3004	0.49	1059	432	504	0	3659	4163	0
3005	1.67	2038	831	0	0	0	0	0
3006	0.50	381	156	520	0	625	1145	0
3007	0.15	79	34	215	0	226	441	0
3008	0.25	815	345	268	0	318	586	0
3009	1.20	1699	717	574	0	610	1184	0
3010	0.19	310	120	79	0	183	262	0
3011	0.40	1258	486	469	0	519	988	0
3012	0.64	1322	511	1124	0	1636	2760	793
3014	0.69	1871	722	967	0	1293	2260	0
3016	0.18	890	343	425	0	979	1404	0
3017	0.21	237	94	1412	0	1442	2854	0
3018	0.52	2614	1030	601	0	388	989	0
3020	0.66	2795	1100	1492	0	3002	4494	793
3021	0.19	762	299	51	0	117	168	0
3022	0.27	952	376	701	0	1115	1816	0
3023	0.30	1293	504	131	0	301	432	0
3024	0.40	887	345	0	0	0	0	0
3026	0.55	2041	823	84	0	194	278	793
3027	0.50	905	365	813	0	1251	2064	0
3028	0.29	781	314	1471	0	1837	3308	0
3029	0.64	2129	790	12	0	28	40	0

Appendix B - Full Build-out Demographic and Economic Forecasts by TAZ

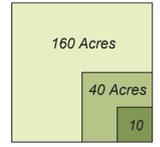
TAZ ID	Area (sq. mi)	Population	Number of Household	Number of Employment				School Enrollment
				Retail	Industrial	Office	Total	
3030	0.18	739	275	145	0	209	354	0
3031	0.07	0	0	562	0	509	1071	0
3032	0.54	2605	965	724	0	233	957	0
3033	0.18	865	321	331	0	159	490	0
3034	0.49	1575	585	0	0	0	0	0
3035	0.24	1036	354	0	0	0	0	0
3036	0.68	3772	1290	803	0	358	1161	0
3038	0.44	2398	820	321	0	0	321	0
3039	0.63	2529	844	82	0	189	271	793
3040	1.03	984	328	130	0	838	968	0
3041	0.34	165	70	0	0	0	0	0
3042	0.31	1102	474	0	0	0	0	0
3043	0.45	1496	643	0	0	0	0	0
3044	0.53	191	82	0	4878	0	4878	0
3045	0.24	612	264	0	0	0	0	0
3047	0.37	1282	549	0	0	0	0	0
3048	0.43	1964	844	409	0	0	409	0
3049	0.61	2228	958	472	0	1007	1479	0
3051	0.35	1337	573	22	0	0	22	0
3052	1.79	528	226	0	0	0	0	0
3057	0.39	733	289	414	0	3003	3417	0
3058	0.80	1135	445	0	0	0	0	0
3059	0.62	1103	433	486	0	1086	1572	0
3060	0.72	596	236	152	0	351	503	0
3062	0.18	0	0	407	0	2956	3363	0

CITY OF LAKELAND, TENNESSEE

COMPREHENSIVE LAND USE PLAN UPDATE

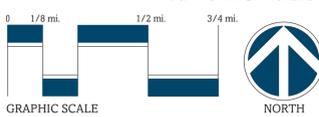


- ±1,662 Ac. **OPEN SPACE**
PUBLIC AND PRIVATE RECREATION FACILITIES AND GREENWAYS
- ±126 Ac. **EXISTING PUBLIC PARKS**
- ±2,089 Ac. **RURAL**
PRIMARILY AGRICULTURAL USES THAT MAY CONTAIN RESIDENTIAL LOTS GREATER THAN 5 ACRES. DEVELOPMENT DOES NOT REQUIRE PUBLIC WATER OR SANITARY SEWER SERVICE. STREETS ARE DESIGNED IN ACCORDANCE WITH A RURAL CROSS-SECTION.
- ±2,008 Ac. **EX-URBAN NEIGHBORHOOD**
PRIMARILY LARGE ESTATE RESIDENTIAL LOTS ON 3-5 ACRE TRACTS BUT MAY CONTAIN AGRICULTURAL USES. DEVELOPMENT REQUIRES PUBLIC WATER BUT NOT SANITARY SEWER SERVICE. STREETS MAY BE DESIGNED WITH A RURAL OR URBAN CROSS-SECTION. REFER TO MAJOR ROAD PLAN.
- ±6,454 Ac. **SUBURBAN NEIGHBORHOOD**
PRIMARILY SINGLE FAMILY RESIDENTIAL LOTS WITH A MAXIMUM DENSITY OF 2.5 LOTS PER ACRE BUT MAY CONTAIN RELIGIOUS FACILITIES, SCHOOLS AND PUBLIC BUILDINGS. DEVELOPMENT REQUIRES PUBLIC WATER AND SANITARY SEWER SERVICE. STREETS SHALL BE DESIGNED WITH AN URBAN CROSS-SECTION.
- ±1,203 Ac. **MIXED USE CENTER**
PRIMARILY PLANNED DEVELOPMENTS THAT MAY CONTAIN SINGLE FAMILY DETACHED, SINGLE FAMILY ATTACHED, MULTIFAMILY RESIDENTIAL, RELIGIOUS FACILITIES, SCHOOLS, PUBLIC BUILDINGS, INSTITUTIONAL USES, OFFICE USES, AND LIMITED COMMERCIAL USES TO SERVE THE PLANNED DEVELOPMENT. DEVELOPMENT REQUIRES PUBLIC WATER AND SANITARY SEWER SERVICE. STREETS SHALL BE DESIGNED WITH AN URBAN CROSS-SECTION.
- ±677 Ac. **RESIDENTIAL SUPPORT CENTER**
PRIMARILY PLANNED DEVELOPMENTS CONTAINING NEIGHBORHOOD COMMERCIAL USES WITH NO ONE USER HAVING GREATER THAN 75,000 SQUARE FEET. LIMITED OFFICE, RELIGIOUS FACILITIES, SCHOOLS, PUBLIC BUILDINGS, AND INSTITUTIONAL USES. DEVELOPMENT REQUIRES PUBLIC WATER AND SANITARY SEWER SERVICE. STREETS SHALL BE DESIGNED WITH AN URBAN CROSS-SECTION.
- ±368 Ac. **EMPLOYMENT CENTER**
PRIMARILY PLANNED DEVELOPMENTS CONTAINING OFFICE CENTERS, RESEARCH AND DEVELOPMENT USES, AND FLEXIBLE OFFICE-WAREHOUSE-COMMERCIAL BUILDINGS AND MAY CONTAIN COMMERCIAL BUILDINGS GREATER THAN 75,000 SQUARE FEET.
- ±227 Ac. **LIGHT INDUSTRIAL**
PLANNED DEVELOPMENTS CONTAINING OFFICE-WAREHOUSE BUILDINGS, SELF STORAGE FACILITIES, BULK WAREHOUSES LESS THAN 75,000 S.F., RIDING ACADEMIES, GREENHOUSES, LUMBERYARDS, MANUFACTURE AND FABRICATION OF SMALL ELECTRONIC EQUIPMENT AND CONTRACTORS STORAGE FACILITIES.
- ±1,173 Ac. **TND OVERLAY**
AREAS ACCEPTABLE FOR PLANNED DEVELOPMENTS SUBSCRIBING TO THE PRINCIPLES OF TRADITIONAL NEIGHBORHOOD DEVELOPMENTS. AREAS MAY CONTAIN SINGLE FAMILY DETACHED AND SINGLE FAMILY ATTACHED RESIDENTIAL AT A DENSITY OF LESS THAN 3.5 UNITS/LOT PER ACRE. AREAS MAY ALSO CONTAIN LIMITED COMMERCIAL, LIMITED OFFICE, PUBLIC BUILDINGS, RELIGIOUS FACILITIES, SCHOOLS AND INSTITUTIONAL USES. AREAS SHALL CONTAIN SUBSTANTIAL ACTIVE AND PASSIVE OPEN SPACES. DEVELOPMENT REQUIRES PUBLIC WATER AND SANITARY SEWER SERVICE. STREETS SHALL BE DESIGNED WITH AN URBAN CROSS-SECTION.
- ±384 Ac. **CONSERVATION OVERLAY**
PRIMARILY PLANNED DEVELOPMENTS CONTAINING SINGLE FAMILY RESIDENTIAL LOTS THAT REQUIRE CONSERVATION DEVELOPMENT PRACTICES IN THE DESIGN AND PRESERVATION OF NATURAL RESOURCES. AREAS SHALL CONTAIN SUBSTANTIAL PASSIVE OPEN SPACE AND POSSIBLY SOME LIMITED ACTIVE OPEN SPACE. DEVELOPMENT REQUIRES PUBLIC WATER AND SANITARY SEWER SERVICE. STREETS MAY BE DESIGNED WITH A RURAL OR URBAN CROSS-SECTION AS APPROVED BY THE MUNICIPAL PLANNING COMMISSION AND BOARD OF COMMISSIONERS.
- ±732 Ac. **MAJOR ROADS AND R.O.W.**
PUBLIC STREETS.
- ±1,714 Ac. **PUBLISHED FLOODWAY**
- ±1,147 Ac. **PUBLISHED FLOODPLAIN**
100 YEAR FLOOD EVENT.
- MAJOR GATEWAY TO LAKELAND**
AREAS DESIGNED TO IDENTIFY VEHICULAR ENTRANCE INTO THE CITY OF LAKELAND.
- MINOR GATEWAY TO LAKELAND**
AREAS DESIGNED TO IDENTIFY ENTRANCE INTO THE CITY OF LAKELAND OR A SECTION OF THE CITY.
- SCENIC CORRIDOR**
PUBLIC RIGHT-OF-WAYS REQUIRING SPECIALIZED DESIGN CONSIDERATIONS TO MAINTAIN THE EXISTING CHARACTER OF THE TRAVEL WAY FOR BOTH VEHICULAR AND PEDESTRIAN USERS.
- POTENTIAL GARNER LAKE DAM BREACH AREA**
AN AREA 500' WIDE ON EACH SIDE OF THE EXISTING SCOTT'S CREEK CENTERLINE THAT MAY OR MAY NOT BE SUBJECT TO BREACH FLOODING. ADDITIONAL STUDY REQUIRED.
ALL ACREAGE AND OTHER MEASUREMENTS ARE APPROXIMATE.



PUBLIC FACILITIES

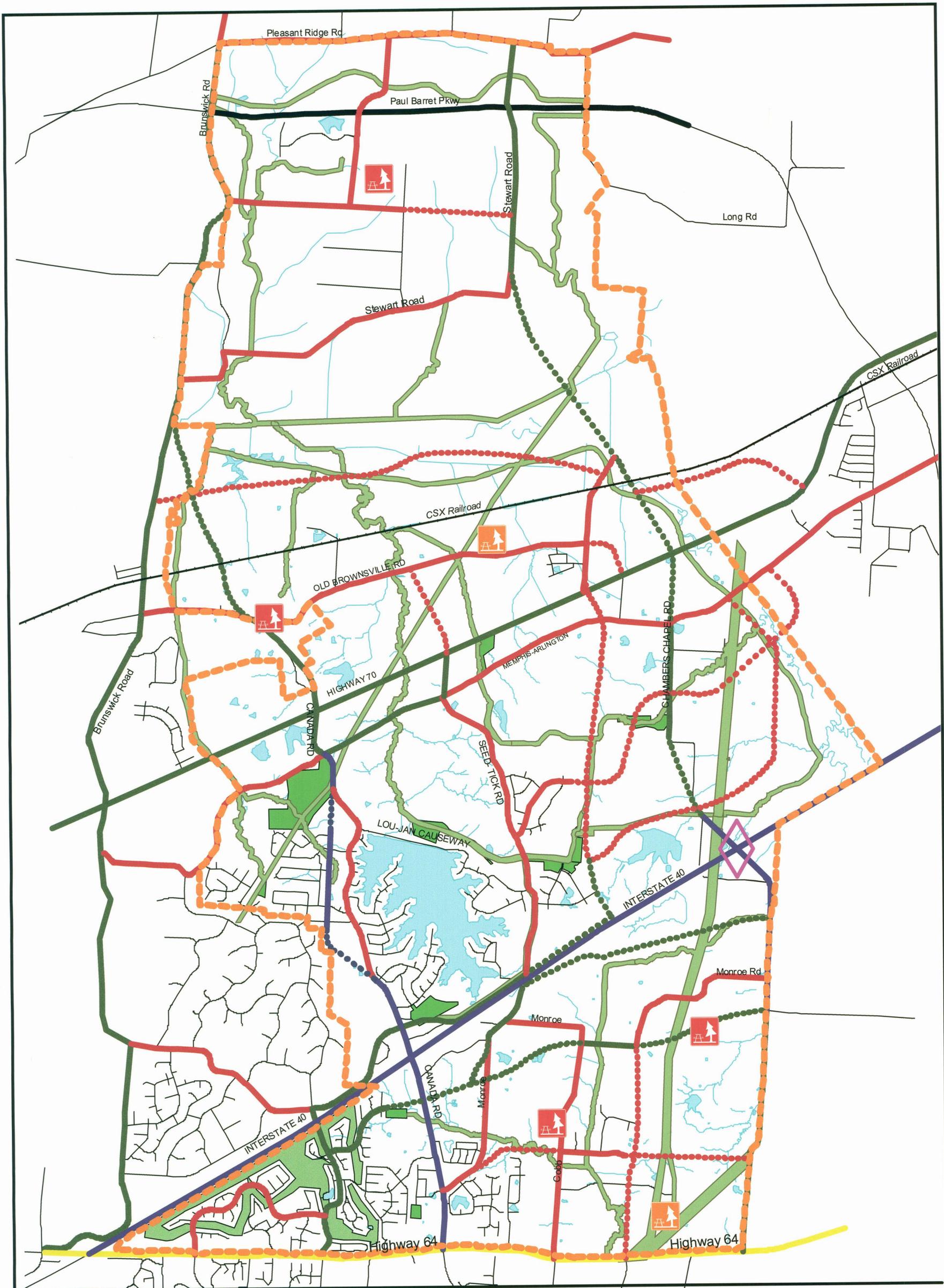
- TP **EXISTING SANITARY SEWER TREATMENT PLANT**
 - TP **PROPOSED SANITARY SEWER TREATMENT PLANT**
 - EXISTING SCHOOL**
 - PROPOSED SCHOOL**
 - 911 **EXISTING FIRE STATION**
 - 911 **PROPOSED FIRE STATION**
 - PROPOSED SHERIFF SUBSTATION**
 - MUNICIPAL PUBLIC FACILITIES**
PRIMARY LOCATION
 - MUNICIPAL PUBLIC FACILITIES**
SECONDARY LOCATION
 - CP **EXISTING COMMUNITY PARK**
 - PROPOSED MUNICIPAL PARK**
A PARK SERVING THE ENTIRE CITY CONTAINING A MINIMUM OF 100 ACRES. ACTIVITIES AND FACILITIES OF THE PARK ARE TO BE ESTABLISHED BY THE PARK AND RECREATION BOARD. PARK MAY CONTAIN ACTIVE AND OR PASSIVE FACILITIES.
 - PROPOSED COMMUNITY PARK**
A PARK SERVING MULTIPLE NEIGHBORS WITHIN A TWO MILE RADIUS. SIZE OF PARK VARIES WITH FACILITIES TO BE PROVIDED AS DETERMINED BY THE PARK AND RECREATION BOARD. SIZE SHALL BE AT LEAST 25 ACRES.
 - PROPOSED NEIGHBORHOOD PARK**
A PUBLIC PARK SERVING AN AREA OF A 1/2 MILE RADIUS THAT CONTAINS A MINIMUM OF 5 ACRES. PARK SHALL CONTAIN AREAS FOR COURT GAMES, OPEN PLAY SPACE, RECREATION EQUIPMENT, A SHELTER, PAVED PATHS, AN OPEN SPACE AND PARKING. NO LIGHTED FACILITIES.
 - PROPOSED COMMUNITY CENTER**
A SITE CONTAINING INDOOR COURT GAMES, ART AND CRAFTS FACILITIES AND MEETING ROOMS. PARK SHALL ALSO PROVIDE SPACE FOR OUTDOOR COURT GAMES, OPEN PLAY SPACE, PASSIVE RECREATION FACILITIES AND RECREATION EQUIPMENT. SIZE OF SITE VARIES BY PROPOSED PROGRAM.
 - BICYCLE / PEDESTRIAN PATHS**
PAVED PATHS 5' TO 12' WIDE DEPENDING ON LOCATION.
 - EQUESTRIAN PATHS**
DESIGNATED EARTHEN PATHS ADEQUATE IN WIDTH FOR TWO RIDERS WITH A VERTICAL CLEARANCE OF 12 FEET.
- ALL PUBLIC FACILITIES ARE APPROXIMATELY LOCATED AND ARE NOT SITE OR PARCEL SPECIFIC.



LAND USE PLAN

Brenda P. Solomito
Land Planner
10145 Mackwood Drive • Lakeland, TN 38002
brendasolomito@bellsouth.net

DUGAN DESIGN GROUP, LLC
planning, landscape architecture, design
5100 WHEELIS DRIVE, SUITE 110 MEMPHIS, TN 38117
TEL 901.680.9080 FAX 901.680.9097
WWW.DUGANDESIGNGROUP.COM
March 20, 2006 E024FinalLandUsePlan.dwg



TRANSPORTATION PLAN CITY OF LAKELAND

LEGEND

- | | | |
|----------------------|--|----------------------|
| City Limits | 7-Lane Roadway | Parks and Greenspace |
| Rail Road | 6-Lane Roadway | Golf Course |
| Road Not in Study | 4-Lane Roadway | Public |
| Proposed Interchange | 4-Lane Freeway | Greenway |
| | 2-Lane Roadway | Lakes |
| | Dashed Lines Indicate New Roads | Streams |



February 3, 2005



Memorandum

To: Philip Stuckert, City of Lakeland
From: Zhiyong Guo, Kimley-Horn and Associates, Inc.
Cc: J. Higbee, Robert Wherry, James Collins, Kenny Monroe
Date: November 12, 2007
Subject: Project Meeting Minutes,
City of Lakeland Special Area Transportation Study

A project meeting was held at the City Hall on November 8, 2007, to discuss project status, schedule, work plan, and to review base and future year planning assumptions. The following were in attendance:

Philip Stuckert	City of Lakeland
J. Higbee	City of Lakeland
Robert Wherry	City of Lakeland
James Collins	Kimley-Horn and Associates
Kenny Monroe	Kimley-Horn and Associates
Zhiyong Guo	Kimley-Horn and Associates

Seven items listed on the meeting agenda (copy attached) were discussed. The results are summarized below:

1. Project Work Plan

The City expressed concerns and necessity of having public involvement built into the major road plan update process. The existing scope of services now only has only one public meeting included. Meeting #4 is included in the scope for a presentation of the findings and recommendations to the Mayor and Board of Alderman. It was agreed that the scope should be modified to include two additional public meetings.

The first meeting is tentatively scheduled at 6:00 PM, December 13, 2007. The main purpose of the first public meeting is to identify needs and vision of the roadway improvements from citizens. KHA will provide a brief agenda of this meeting by November 12, so that the announcement can be published in the City Watch publication.

The second public meeting will be scheduled after the deficiency analysis is complete and alternatives of the roadway network are drafted. The purpose of this meeting is to seek public comments on alternatives. The date and agenda for the second meeting will be determined at the first public meeting.

Public meeting preparation and attendance are additional services to be performed by KHA. The meetings will also impact the original project schedule. KHA will submit fee estimates and update the project schedule for the City to review and approval.

2. New TAZ Boundaries

KHA presented the proposed TAZ boundaries and the methodology used to develop them. The City asked why some of the TAZs outside the city limits were included in the maps. KHA clarified that the included TAZs were included because they are partial TAZs of the regional model TAZs. The demographic data for these zones has to be updated as part of the project. KHA will not include these zones in the deliverables. The City generally agreed that the new TAZ structure is consistent with the land use plan and is reasonable.

3. Base Year Household and Employment Distribution

KHA explained that the purpose of validating the base year demographic data is to calibrate and validate the travel model parameters. The City agreed to provide a map and a spreadsheet with existing business locations to KHA. This information will be used to update the base year employment distribution.

4. Household and Employment Forecast Methodologies

The methodology and parameters used to forecast the full build-out household and employment were discussed. KHA explained that the Conservation Overlay was not being considered in the preliminary forecasts because the household density is the same with or without the conservation overlay. The City said that this “Density Neutral” approach is likely to change in the near future. The City is also in the process of updating their zoning policies, including the percent distribution of different commercial or residential types in each type of land use category. The results of these changes will invalidate the assumptions made by KHA. The City agreed to have additional staff review of these parameters and provide comments as soon as possible. To meet the original project schedule, KHA planed to start the full build-out model development during the first week of December. If additional changes to the future year demographic and employment are requested by the City after the first week of December, additional effort to update the forecasts and all tasks depending on the forecasts

will be required. This change will also negatively impact the current project schedule.

5. Full Build-out Household and Employment Forecast Distribution

The preliminary future year forecasts were briefly reviewed. KHA agreed to send the forecast total number of households to the City for review. Per a previous study conducted by the City, the full build-out population is expected to be in the range from 40,000 to 45,000. KHA will put this task on hold until the forecasting parameters were reviewed by the City.

6. Base Year roadway network

KHA clarified that the base year network includes all existing roadways that are included in the existing Major Road Plan, as well as those collector/feeder roads that will help loading traffic for the travel demand model. The City had no comments on the base year roadway network.

7. Full Build-out Roadway Network

The future roads and alignments shown in existing Major Road Plan and the land use plan are not consistent. The differences were briefly discussed as follows:

- 1) The future East-West road north of the railroad known as Loosahatchie Parkway is shown in the Major Road Plan, but not in the Land Use Plan. This road will not be included in the study. This project was functionally replaced by the SR-385 and is not included in the LRTP.
- 2) Extension of Beverle Rivera to Chambers Chapel should be included in the study.
- 3) Chamber's Chapel extension (North – South through the flood plain) should be included in the study for both North-South connectivity and congestion relief in the full build-out scenario.
- 4) A North-South overpass between Canada Rd and Chamber's Chapel to cross I-40 should be studied to improve North-South connectivity.
- 5) There is a new alignment of Monroe Road east of the Outlet Mall. Both the City and KHA are not aware of any reason to justify the alternative alignment. The new alignment will be dropped and the new road will reuse the existing alignment of Monroe Road.
- 6) Steward Road extension to Long Road was discussed but no conclusion was reached.

Additional differences between the Major Road Plan and the Land Use Plan were omitted from the discussion. There was discussion by the City about whether the differences between the Land Use Plan and the Major Road Plan may exist.

Action Items:

- 1) KHA will report total number of households and population in the preliminary forecast.
- 2) KHA will submit a draft agenda for the first public meeting.
- 3) City will send the PDF map and spreadsheet for existing business locations.
- 4) City will review the forecast parameters and provide comments.

Memorandum

To: Philip Stuckert and J Higbee, City of Lakeland
From: Zhiyong Guo, Kimley-Horn and Associates, Inc.
Cc: Kenny Monroe
Date: February 15, 2007
Subject: Project Meeting Minutes,
City of Lakeland Special Area Transportation Study

A project meeting was held at the City Hall on February 13, 2008, to review future roadway alignment options and discuss plan alternatives. The following were in attendance:

Philip Stuckert	City of Lakeland
J. Higbee	City of Lakeland
Kenny Monroe	Kimley-Horn and Associates
Zhiyong Guo	Kimley-Horn and Associates

Five items listed on the meeting agenda (copy attached) were discussed. The discussion results are summarized below:

1. Future Roadway Alignment Differences:

There are a total of 12 future roadway alignment differences between the existing Major Road Plan and the Comprehensive Plan were discussed and the following consensus were reached:

- 1) Monroe Rd extension to the east
Follow the Major Road Plan (align with Sumac Rd in Arlington)
- 2) Cobb Rd extension to the north

It was agreed to have two alternative crossing locations at I-40. The first alternative is to cross I-40 from Seed Tick Road. For this alternative, the Cobb Road will be extended straight north to Monroe Cv, as shown in the Comprehensive Plan. The second alternative is to cross I-40 from the future Lakeland Trace Rd. For this alternative, Cobb Rd will be aligned with the Lakeland Trace Rd.

- 3) New I-40 overpass
See alternatives discussed above.
- 4) Beverle Rivera Rd extension to Huff N Puff Rd
Beverle Rivera Rd will be extended east and tie into Huff N Puff Rd. Existing Huff N Puff Rd on the west side will curve up and intersect with Beverle Rivera as a T-intersection.
- 5) Lakeland Trace Rd - Resolve alignment differences
City will provide plans to KHA. Part of this road was already being built or plans approved (EQUESTRIA Development).
- 6) Gillespie Oak Dr extension - Which alignment is better
It was agreed to follow the Comprehensive Plan. The City will have a field check on some pieces that were already being built and will provide more information to KHA.
- 7) New E-W road between Mem-Arl and Gillespie Oak Dr
Follow the Comprehensive Plan. The City will provide plans for the segment east of Seed Tick Rd (Estates of Maple Grove).
- 8) New E-W road between Mem-Arl and Gillespie Oak Dr (Segment next to Arlington)
Remove this segment.
- 9) Old Brownsville Rd new alignment and extension
The extension will cross Canada Rd in right-angle and will avoid existing homes.
- 10) E-W new collector road between Old Brownsville and US 70
Follow the Comprehensive plan. The City will provide plans for the east part of this road.
- 11) Seed Tick Rd extension to Old Brownsville – Resolve Alignment differences
Follow the Comprehensive Plan.
- 12) New road north of US 70 east of Chamber’s Chapel Extension – Needed or not
Remove this segment.

2. Already Resolved Future Roadway Alignment:

Seven items were discussed in this category:

- 1) Loosahatchie Parkway - Removed
- 2) Beverle Rivera Extension to Chambers Chapel - Added
- 3) New alignment of Monroe Rd east of the outlet mall – Removed
- 4) Monroe Cv extension to Chambers Chapel (Parallel to I-40) – Used alignment in Land Use Plan.
KHA will modify the roadway alignment to avoid the existing lake. KHA will also modify the alignment east of Chambers Chapel to avoid crossing parcels.
- 5) Chambers Chapel extension to Stewart Rd - Used alignment in Land Use Plan.
- 6) Monroe Rd extension to US 64 - Used alignment in Land Use Plan.
- 7) Bentbrooke Dr extension to Monroe Rd - Used alignment in Land Use Plan.

3. City's preference on lanage:

- 1) What specific segments the City prefer to stay as 2-lane road?
The City prefers Memphis Arlington, Seed Tick Rd, and Old Brownsville to stay as 2-lane road.
- 2) Discuss Leslie's comments on four roadway segments.
Leslie's comments were briefly discussed based on the preliminary assignment volume. Memphis Arlington and Seed Tick Rd will likely stay as 2-lanes. Canada Rd and Chambers Chapel would most likely need 4-lanes. Highway 70 could be 4-lane divided but KHA would recommend the City to reserve the ROW for 7-lanes.
- 3) What' the City's vision on roadway cross-sections (Divided/TWLTL/Undivided)?
The City is in the process of reviewing the cross-sections. The City will provide feedback to KHA next week.

4. Citizen's needs and comments:

Summary of the Citizen's comments from the first public meeting was submitted to the City. KHA believe that the comments generally agreed with the projects being considered in the planning process. KHA and the City will discuss the comments further before the next public meeting.

5. Study Alternatives:

The City agreed to have two alternative scenarios. The only differences between these two alternatives are the I-40 crossing locations. The first alternative will cross I-40 from Seed Tick Rd, and the second alternative will cross from the new Lakeland Trace Rd.

Action Items:

The City will provide the following items to KHA by the end of next week (Feb. 22):

- 1) Plans for Lakeland Trace Rd ((EQUESTRIA Development).
- 2) Provide more information on the City's preference of new road layout on Chapel Hill area, based on City's field review.
- 3) Plans for the new E-W road between Mem-Arlington and Gillespie Oak Dr (Estates of Maple Grove).
- 4) Plans for E-W new collector road between Old Brownsville and US 70 (segment on the east side, Lakeland Heights).
- 5) Street type preferences: provide a list of streets with landscape median or TWLTL.

CITY OF LAKELAND MAJOR ROAD PLAN UPDATE

AGENDA

Public Meeting #1

December 13, 2007 6:00pm-7:30pm

Objective: Review the major road plan update process, discuss transportation issues in the City of Lakeland, and discuss the goals of the study.

1. Introductions and Opening Remarks
2. Study Background
3. Vision, Goals, and Objectives
4. Project Scope: Tasks, Schedule and Process
5. Study Area Map
6. Group Exercise : Issues Identification
7. What's Next : Findings, Recommendations, Your Input Again, and Approval



City of Lakeland Major Road Plan Update

Public Input Meeting #1
Lakeland City Hall
10001 Highway 70, Lakeland, TN
December 13, 2007 6:00pm-7:30pm

Name	Phone Number	Address	E-mail
James Collins	374-9109	3175 Lenox Park Blvd., Suite 200, Memphis 38115	James.Collins@kimley-horn.com
Kenny Monroe	374-9109	3175 Lenox Park Blvd., Suite 200, Memphis 38115	Kenny.Monroe@kimley-horn.com
Zhiyong Guo	374-9709	3175 Lenox Park Blvd., Suite 200, Memphis 38115	Zhiyong.Guo@kimley-horn.com
Sharion McInnis	374-9709	3175 Lenox Park Blvd., Suite 200, Memphis 38115	Sharion.McInnis@kimley-horn.com
Don Barber	867-4029	9670 Memphis Arlington Lakeland TN 38002	
Jean Clency	388-9913	3960 Blue Spruce Cir Lakeland TN 38002	
Bryce & Dot Nunnelee	377-6360	3817 Canada Rd Lakeland TN 38002	
Vicky Fee	388-1500		eastshelbyreview@yahoo.com
Randy Nicholson	867-9486	3525 Chambers Chapel Lakeland TN 38002	
Bob Sweeney	373-0380	5909 Shelby Oaks # 200	bob@srce-memphis.com
Frances Lancaster	867-1290	9996 Memphis-Arlington Lakeland TN 38002	fplancaster@yahoo.com
Phil Wright	867-7808	4443 Mt. Gillespie Lakeland TN 38002	Wright8115@bellsouth.net



Name	Phone Number	Address	E-mail
Paula Ruppelt	867-4021	9390 Old Brownsville Lakeland TN 38002	Paula@onelightgroup.com
Boyd Ruppelt	867-8164	9390 Old Brownsville Lakeland TN 38002	boyd@onelightgroup.com
Rudolph Jones	388-4933	4836 Canada Rd Lakeland TN 38002	Rudolph.jones@brunswickhouse.org
Susan Jones	388-4933	4836 Canada Rd Lakeland TN 38002	Rudolph.jones@brunswickhouse.org
Ron May	867-3801	10963 Chapel Hill Lakeland TN 38002	WRMAY007@aol.com
Jim Schoemaker	867-1568	10026 Point CV Lakeland TN 38002	Jshoemaker@shoemakerfinancial.com
Rick Gafford	748-1811	9180 Crestwyn Hills Dr Memphis TN 38125	rgafford@fisherarnold.com
John Pankey	748-1811	9180 Crestwyn Hills Dr Memphis TN 38125	jpankey@fisherarnold.com
Michael Oaks	545-4332	742 West Dr Memphis TN	Michael.oaks@shelbycountyttn.gov
Bob Turner	335-1384	1800 Latting Lane Cordova TN 38016	bturner@southernprop.net
Gene W. Howard	867-1599	9905 Memphis Arlington Lakeland TN 38002	Ghoward89@bellsouth.net
Joe Allen	251-9531	3968 Forest Point Way Lakeland TN 38002	cacy@aol.com
Roger A. Helms, Sr	867-7873	10661 Chapel Hill Lakeland TN 38002	
Steve Butler	867-9291 ?	9920 Memphis Arlington Lakeland TN 38002	

Questionnaire

City of Lakeland
Major Road Plan Update

- 1. Goals and Objectives.** What do you think the goals and objectives of this plan should be?

- 2. Current Issues.** What are the major problems and issues affecting transportation in City of Lakeland? List three top transportation problems, in their order of priority.

- 3. Access and Mobility.** Indicate on your map routes where the traffic congestion is a problem. Show where new routes or connections should be made.

- 4. Safety.** Indicate on your map where you feel safety is a concern, either from traffic or crime or other hazards.

Questionnaire

City of Lakeland
Major Road Plan Update

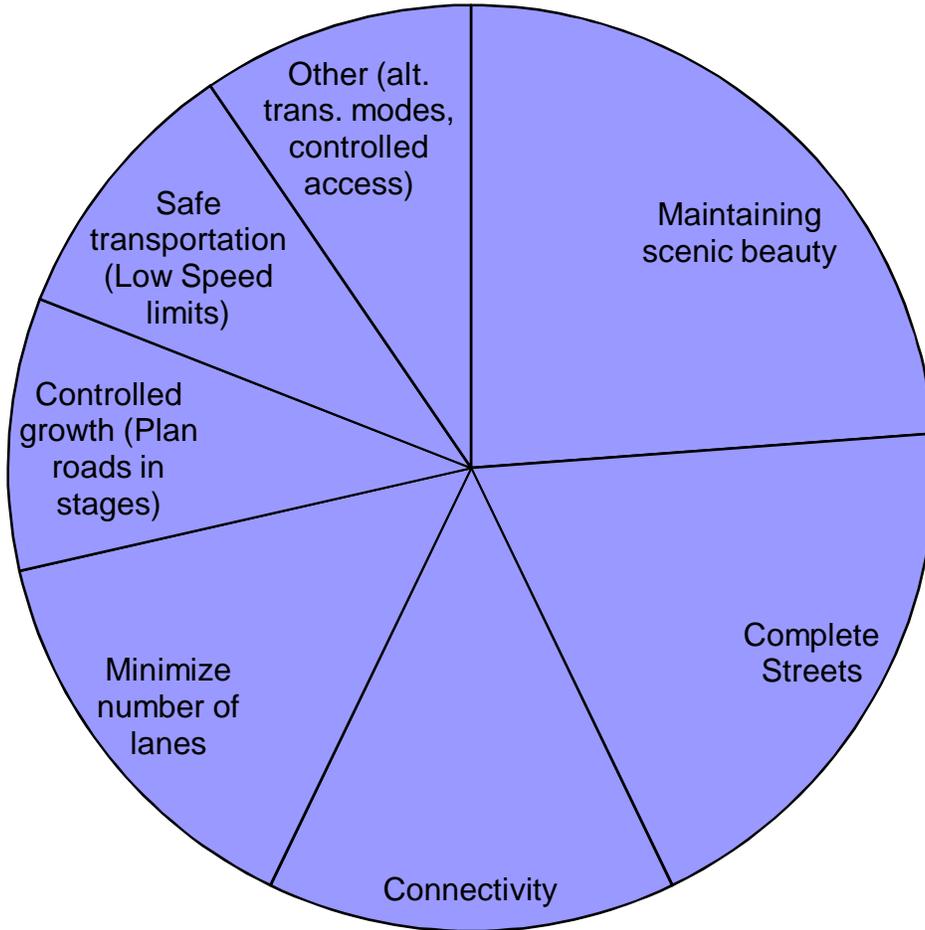
- 5. Appearance / Pride.** Are there roadways that are attractive or unattractive? Indicate on your map where aesthetics should be maintained or where beautification programs or features could enhance transportation corridors.

- 6. Create Accessibility and Connections to Business Areas from Residential Areas.** Identify on your map where the lack of accessibility and connectivity is significant or detrimental to economic development.

- 7. A Perfect Transportation System.** If you were King or Queen of Lakeland, list up to three main features that Lakeland's transportation system would have if it was perfect (e.g. no traffic jams, kids don't need parents to drive them anywhere, etc).

1. Goals and Objectives. What do you think the goals and objectives of this plan should be?

Goals and Objectives



2. Current Issues. What are the major problems and issues affecting transportation in City of Lakeland? List three top transportation problems, in their order of priority.

- Congestion on Memphis Arlington
- Excessive retail in residential areas
- Maintain current connectivity in existing areas
- Not enough lights on Canada Rd
- Canada Rd @ Highway 70
- Limited interchanges with I-40
- Canada Rd @ Huff & Puff
- Excessive traffic from commercial (at the expense of residents)

Questionnaire Summary (Public Meeting #1)

City of Lakeland
Major Road Plan Update

- Traffic accidents on Canada Rd
- Canada Rd @ I-40
- Highway 70 safety

3. **Access and Mobility.** Indicate on your map routes where the traffic congestion is a problem. Show where new routes or connections should be made.

Current Congestion Problems	Frequency
Canada Rd @ Highway 70	1
Canada Rd @ Huff & Puff	1
Canada Rd @ I-40	4

Future Problems	Frequency
Highway 70 @ Seedtick (Potential problems with increasing commercial along Highway 70 / Memphis Arlington)	1
Memphis Arlington @ Seedtick (Potential problems with increasing commercial along Highway 70 / Memphis Arlington)	1
No connection @ Huff N Puff/ Beverle Rivera	1

New Connections Suggested:

- Chambers Chapel @ I-40 interchange
- Seed Tick and Malone/Cobb Rd
- Seed Tick and Monroe Connection
- More E-W Routes
- Extend Huff N Puff across Seed Tick
- Chambers Chapel (from Memphis Arlington to Highway 70)
- Extend Beverle Rivera across Canada
- Extend Canada Rd North and intersect with Brunswick near Stewart Rd
- N-S realignment of Canada Rd @ Old Brownsville Rd
- N-S route from Old Brownsville Rd to Memphis-Arlington located west of Canada Rd and East of Brunswick Farms Dr
- Extend Cobb Road east to SR-385

Questionnaire Summary (Public Meeting #1)

City of Lakeland
Major Road Plan Update

4. **Safety.** Indicate on your map where you feel safety is a concern, either from traffic or crime or other hazards.

Comments	Frequency
Intersections	
Canada Rd @ Highway 70	6
Highway 70 @ Seed Tick	6
Highway 70 @ Evergreen	5
Canada Rd @ I-40	3
Canada Rd @ Huff & Puff	1
Other Comments	
Bicycle and Ped safety mixed with heavy vehicle traffic	2
Canada Rd between I-40 and Highway 70	1
Highway 70 vertical alignment	1
Canada Rd @ I-40 needs more lighting	1
Reduce speed limits to 35 mph	1
Traffic and crime with increasing commercial	1
Reduce speed along Chambers Chapel	1

5. **Appearance / Pride.** Are there roadways that are attractive or unattractive? Indicate on your map where aesthetics should be maintained or where beautification programs or features could enhance transportation corridors.

Comments	Frequency
Attractive	
Memphis Arlington (scenic area)	6
Seed Tick Rd	6
Old Brownsville Rd	1
Unattractive	
Huff & Puff (commercial area)	2
Other Comments	
Maintain 2 lanes on Seed Tick between Highway 70 and Memphis Arlington	2
Chambers Chapel (Complete Street)	1
Complete Streets	1
Decorative elements @ interchanges to highlight "gateway" to Lakeland (Hwy 64 @ Canada, Hwy 64 @ Chambers Chapel, Highway 70 @ Lakeland City Limits)	1
Landscaping along Highway 70	1
Maintain 2 lanes on Memphis Arlington from Canada Rd to Seed Tick	1
Maintain 2-lane roads where possible	1
Maximum lanes = 4	1
Medians with landscaping	1

Questionnaire Summary (Public Meeting #1)

City of Lakeland
Major Road Plan Update

- 6. Create Accessibility and Connections to Business Areas from Residential Areas.** Identify on your map where the lack of accessibility and connectivity is significant or detrimental to economic development.

Comments	Frequency
Canada Rd @ I-40	1
Commercial on Highway 70	1
Fearful of connectivity causing crime	2
Huff & Puff- make a dead end , make Beverle Rivera an extension of Monroe Rd	1
Keep all commercial on Highway 64 or Canada Rd	2
Keep commercial on 4 lane roads	1
New interchange at I-40 and Chambers Chapel	1
Reasonable access to commercial areas	3
Create walkways between residential and commercial @ Canada and I-40	1
Create walkways between residential and commercial @ Canada and Highway 70	1

- 7. A Perfect Transportation System.** If you were King or Queen of Lakeland, list up to three main features that Lakeland’s transportation system would have if it was perfect (e.g. no traffic jams, kids don’t need parents to drive them anywhere, etc).

Comments	Frequency
Memphis Arlington Rd (Not a major arterial)	1
Balance of development and rural areas without maxing out land capacity)	1
Effective operation of Canada Rd @ I-40 interchange	1
Scenic Streets	2
Clean up Canada Rd @ Huff & Puff	1
Connectivity between commercial and all neighborhoods	2
Maximum of 4 lane roads with medians	1
Bicycle and Pedestrian lanes on rural roads only	2
Complete Streets	1
Slow and controlled growth	1
Commercial on Highway 64 or Canada Rd	1
Small shopping complex for all commercial	1
Low Speed	1

Memorandum

To: Philip Stuckert, City of Lakeland
From: Zhiyong Guo, Kimley-Horn and Associates, Inc.
Cc: Kenny Monroe
Date: June 18, 2008
Subject: Summary of Public Meeting #2,
City of Lakeland Special Area Transportation Study

The second public meeting was held at the Lakeland City Hall on June 17, 2008, to present the plan alternatives, the draft recommendations, and solicit comments.

The following were leading the presentation and discussion:

Philip Stuckert	City of Lakeland
Kenny Monroe	Kimley-Horn and Associates
Zhiyong Guo	Kimley-Horn and Associates

The meeting agenda is attached. The sign-in sheet (copy attached) listed other attendees of the meeting. The discussion results are summarized below.

Mr. Stuckert opened the presentation with a brief introduction of the project and Consultant. Mr. Monroe presented the planning process used in the study and provided an update of the project status. The public comments and concerns from the previous public meeting were summarized and presented. Mr. Guo presented the plan alternatives and highlighted the major changes compared with the existing Lakeland Major Road Plan. Draft recommendations for the plan were also presented. Mr. Stuckert briefly discussed the plan adoption process.

During the meeting questions and comments were received from the public. These comments and responses are summarized as follows:

- 1. Why are some roadway segments that were previously discussed with the City as part of other projects not shown on the map?(specifically, Cool Spring Rd)*

This question was asked before the plan alternatives and recommendations were presented. Mr. Stuckert and Mr. Monroe explained that the Major Road Plan will only show the major significant routes. The roadways classified as arterial roads or above and significant collector roads are included. Other less significant collector roads and local streets are not shown. Public comments and concerns related to the smaller roads not in the Major Road Plan will be fully considered when the area is developed and the site goes through the planning and site approval process.

2. *The map did not show clearly the differences between the existing and proposed Major Road Plans and how public suggestions have been incorporated into the plan.*

This question was asked before the plan alternatives and recommendations were presented. Mr. Monroe explained that the major differences will be discussed in the remaining part of the presentation and more detailed comparison between the existing and proposed plans will be included in the study report. Mr. Guo added that the Consultant was already developed draft tables and text to describe the differences segment by segment.

3. *What is the projected traffic volume on Memphis-Arlington Road? Is the projected traffic volume different between the 2004 study and the current study? What are the reasons for these differences? Is the impact of Harding Academy development considered?*

[The specific volumes were looked up after the meeting. Since the picture in the presentation slide was unclear, the City will send the volume map in PDF format to Ms. Frances Lancaster.]

There are two major differences between the 2004 and current studies which are the major causes of the decreasing future traffic volume. The first major difference is the change in Land Use Plan. The new land use plan was adopted after the 2004 study. Future traffic changes on Memphis-Arlington are not only due to the land use change in the adjacent parcels, but also land use changes throughout the city. The second major difference is the methodology or tools used to forecast future traffic. The 2004 study was using the old MPO Model which was generally overestimating traffic compared with the new MPO model finished in 2007.

Separate traffic study is required for the proposed Harding Academy development after the Major Road Plan is completed. Additional traffic impact will be evaluated as a part of the required study results will be presented to the City.

4. *Will Davies Plantation Rd be 4-lanes and why?*

A 4-lane divided section was recommended for Davis Plantation Road. The reasons are 1) to support commercial land use type in the surrounding area, and 2) to accommodate future year traffic volume and relieve congestion on Canada Road.

5. *Was there any change on the Old Brownsville Rd extension west and beyond Canada Rd?*

The Brownsville Rd will be extended west as shown on both the Land Use Plan and recommended by the Major Road Plan. The Major Road Plan modified the alignment slightly to bypass the existing residential properties based on the public comments from the previous meeting. The exact alignment of the extension will be determined during the engineering design phase.

6. *Is there additional bike and pedestrian features being considered on Old Brownsville Rd?*

Bike and pedestrian features are not shown on the Major Road Plan, but additional bike and pedestrian features will be considered when the roadway improvements are designed. Mr. Higbee added that the city is planning to develop a bike and pedestrian plan after the major road plan and the rezoning effort are complete.

7. *Is there any prioritization of the recommended improvements?*

The Major Road Plan does not include any prioritization of the project. The prioritization will be done as a part of the city's Capital Improvement Program (CIP) based on the funding sources and availability and the sequences of development occurs.

8. *Does the methodology used to develop the traffic volumes (the Model) take context sensitive solutions into consideration?*

Mr. Stuckert explained that one major part of the context sensitive design is the public involvement process. This process will be emphasized during the design process of each individual projects. Mr. Monroe added that the travel demand model used as a part of this study is more capable of capturing many aspects of context sensitive solutions. Examples include more detailed household attributes, more categories of different types of employment, and enhanced roadway characteristics such as median type, shoulder width, area type, and travel lane width.

Attachments:

1. Public Meeting #2 Agenda
2. Sign-in Sheets.

CITY OF LAKELAND MAJOR ROAD PLAN UPDATE

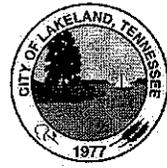
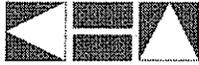
AGENDA

Public Meeting #2

June 17, 2008 6:00pm-7:30pm

Objective: Summarize previous public meeting held in December 2007 covering results and findings, and discuss the proposed Transportation Plan with alternatives and recommendations.

1. Introductions and Opening Remarks
2. Project Status Update
3. Summary of previous public meeting held December 2007 (Review of public input and written comments)
4. Discussion of Proposed Transportation Plan (Review of land use, traffic volumes, and proposed roadway configurations; KHA Recommendations and Alternatives suggested by the Plan)
5. Discussion of the Adoption of the Plan for Lakeland
6. Questions



City of Lakeland Major Road Plan Update

Public Meeting #2
Lakeland City Hall
10001 Highway 70, Lakeland, TN
June 17, 2008 6:00pm-7:30pm

Name	Phone Number	Address	E-mail
Richard + Lorraine Gomez	867-1255	5310 Saffron Spring Dr. Lakeland	
LOUIS Watkins	867-4022	5331 Evergreen Creek Lakeland TN	
RUDOLPH JONES	388-4933	4836 CANADA ROAD	
ALL HELTON	372-7625	4309 CANADA ROAD	
DRAKE DANCEY	374- 9109	3175 CEDAR PARK MEMPHIS, TN 38115	
Kim Donovan	867- 3328	9950 Mphs. Art.	
Pat Hummel	377-6360 901	6864 Hawthorn	
Shirley Oak	867-4029	9670 Memphis Orange	
DBE	11	11	
Cindy Reaves	870-7103	5909 Shelby oaks Dr suite 200	cindy@SRCE-memphis.com
Lisa MOSES	867-7848	9354 38134 Old Brownsville	already receive
Steve Broom	867-1141	5289 Saffron Spring	stevebroom@member.afa.org

