# Development of Roadway Impact Fees For the City of Waxahachie, Texas

**Final Report**


Submitted By:
**Freese and Nichols, Inc.**

September 5, 2008

# TABLE OF CONTENTS

# LIST OF TABLES

Page



# LIST OF FIGURES

Page

# 1.
# Introduction

Shrinking funds available for transportation improvements on city thoroughfares have prohibited many cities from upgrading infrastructure to meet increasing travel demands resulting from new growth. As a result, many cities collect "impact fees" from new development to help fund transportation improvements necessitated by such development. What is unique and perhaps controversial about impact fees is that they often finance roadway improvements that are outside the development itself. However, when considering traffic implications created from a system standpoint, impact fees provide a means by which infrastructure may keep pace with such development.

Texas initially authorized the use of impact fees with the passage of Senate Bill 336 during the 1987 legislature. Now codified in Chapter 395 of the Texas Local Government Codes, the legislation authorizes cities to collect fees from new developments to finance new construction or expansion of capital improvements such as water treatment and distribution facilities, storm and wastewater facilities, and transportation facilities. The law stipulates that all fees collected from new development must not exceed the maximum amount calculated by the methodology described therein.

The law also mandates that impact fee systems be updated periodically to ensure that an appropriate cost per service unit is established. As new transportation improvements are completed, actual costs are inserted into the cost per service unit calculation to reflect a more accurate reading of service area costs as opposed to estimated costs that were established at the onset of the impact fee system. Additionally, new capital improvement projects can be added to the system.

In September 2001, Chapter 395 was amended, which called for several technical and administrative changes including the following:

- Expansion of the permissible service area structure for roadway facilities from three to six miles;
- A credit for the portion of ad valorem tax revenues generated by improvements over the program period, or the credit equal to 50% of the total projected cost of implementing the capital improvements plan;
- A city's share of costs on the federal or Texas highway system, including matching funds and costs related to utility line relocation, the establishment of curbs and gutters, sidewalks, drainage appurtenances, and rights-of-way;
- Increase in the time period of update of impact fee land use assumptions and capital improvements plan from a three to five year period;

- Changes in compliance requirements as they relate to annual reporting; and
- Consolidation of the land use assumptions and capital improvements plan hearings.

The implementation of a roadway impact fee system complying with Chapter 395 and offers several advantages. The advantages of such a system include: 1) a systematic, structured approach to assessment of fees, 2) a clear, equitable distribution of costs associated with the impact of new development, 3) the ability to pool funds for project initiation within a service area, 4) assurance that fees collected will be spent in the area where new development is occurring, 5) up-front knowledge of fees to be imposed, 6) credits for developer participation, and 7) ability for developers to demonstrate that, pursuant to city guidelines, specific unit equivalencies may be different from those presented in the land use equivalency table.

Recognizing the need to provide safe and adequate facilities and desiring to have equitable funding of transportation improvements, the City of Waxahachie retained Freese and Nichols, Inc./Sefko Planning Group (FNI/Sefko Planning Group) to assist in the development of a roadway impact fee system.

**Study Methodology**

To develop roadway impact fees, a series of work tasks were undertaken. These tasks are described below.

1. Meetings were held with the City of Waxahachie Staff and the Capital Improvement Advisory Committee to discuss the roadway methodology to be used in the study.

2. Appropriate data was collected to establish the basis for subsequent analyses.

3. Roadway impact fee service areas were established within the Waxahachie city limits.

4. Vehicle-miles of travel in the PM peak hour was recommended and used as the appropriate service unit for transportation impact fee calculations.

5. A roadway inventory was conducted on Waxahachie thoroughfares to determine lane geometries, roadway classifications and segment lengths. Arterial and/or collector streets from the City Thoroughfare Plan were selected for system analysis.

6. The existing roadway network was evaluated based on traffic volume counts, collected May 2008, to determine roadway capacity, current utilization, and if any capacity deficiencies exist within each impact fee service area.

7. New vehicle-miles of demand (over a 10-year planning period) were calculated for each service area based on the land use equivalency table supplemented with demographic data of population and employment growth from the Land Use Assumptions Report prepared by Sefko Planning Group on May 15, 2007. The Land Use Assumptions for Impact Fees report was publically heard and approved by the Waxahachie City Council on June 16, 2008.

8. A roadway impact fee capital improvements plan was developed based on projected growth, analysis of existing system deficiencies, the Waxahachie Comprehensive Plan, and City Staff.

9. Roadway costs associated with construction, engineering, right-of-way, and project financing for capital improvement projects were prepared by the Freese and Nichols, Inc. Costs for study updates are eligible for recovery and were included in the total project cost. Roadway cost data was compiled and tabulated by service area.

10. The cost of capacity supplied, cost attributable to new development and the maximum cost per service unit was calculated for each service area.

11. The maximum cost per roadway service unit was calculated for service areas. A discounted cost per service unit was also calculated to meet Chapter 395 requirements.

12. This report was prepared to document the procedures, findings, and conclusions of the study.

**Organization of Report**

This report describes the background information, analysis, and findings of the study in six parts, with a chapter devoted to each:

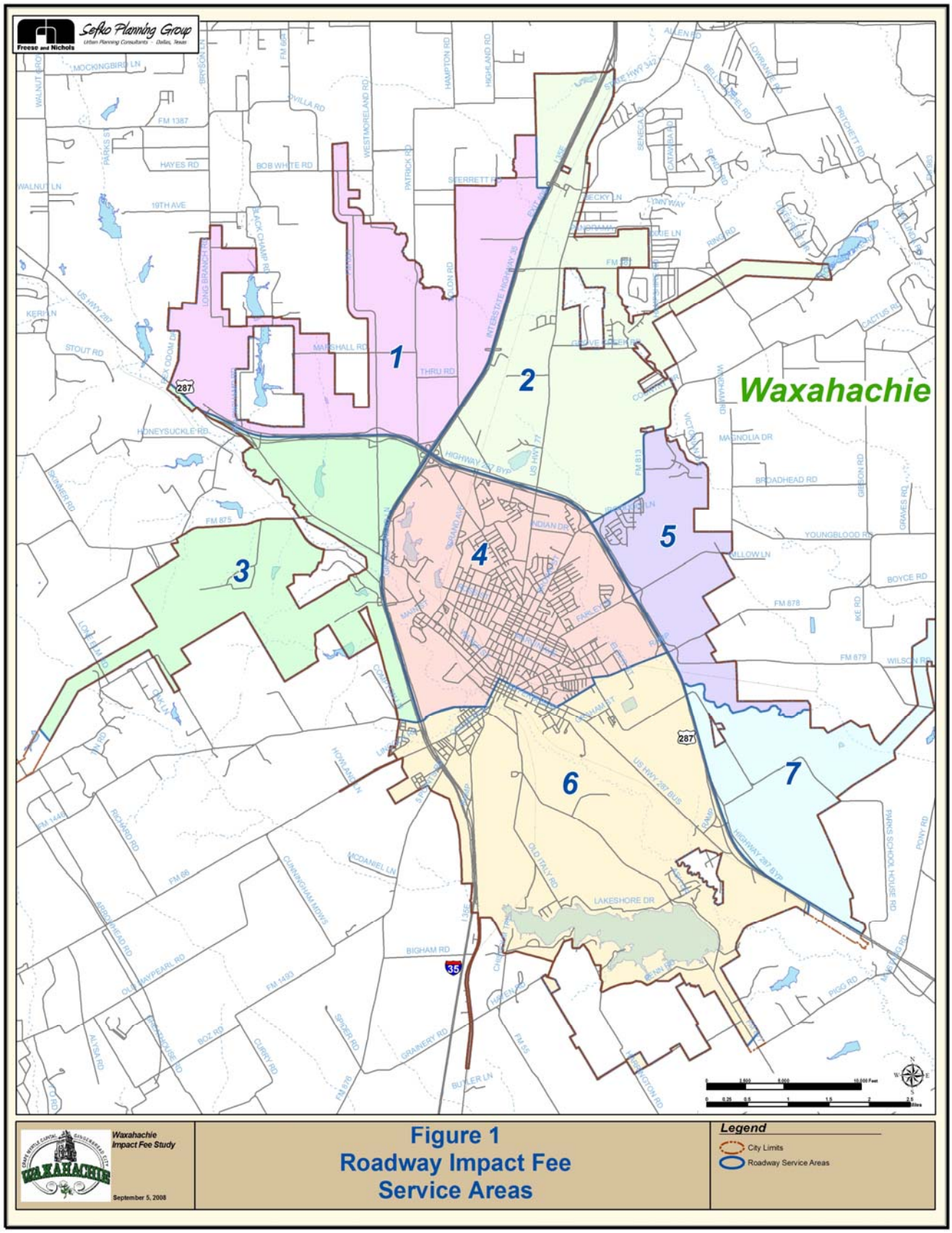
- Roadway Impact Fee Service Areas (Chapter 2)
- Roadway Impact Fee Service Units (Chapter 3)
- Existing Conditions Analysis (Chapter 4)
- Projected Conditions Analysis (Chapter 5)
- Calculation of Impact Fees (Chapter 6)
- Conclusion (Chapter 7)

# 2.
# Roadway Impact Fee Service Areas

Chapter 395 requires that service areas be defined for impact fees to ensure that facility improvements are located in proximity to the area that is generating the need. Legislation requires that roadway service areas be limited to a six-mile maximum and must be located within the current city limits. Transportation service areas are different from other impact fee service areas, which can include the city limits and Extra-Territorial Jurisdiction (ETJ). This is primarily because roadway systems are "open" to both local and regional use as opposed to a defined limit of service that is provided with water and wastewater systems. The result is that new development can only be assessed an impact fee based on the cost of necessary capital improvements within that service area.

A service area structure was developed using the criteria defined in Chapter 395 as it relates to conformance with city limits and the six-mile boundary limits. Other considerations included use of physical or natural features (i.e., major roadway facilities or creeks, etc.), potential roadway projects and their relation to undeveloped areas of the community, projected growth, census and other demographic boundaries, and long-range planning of service area expansion for municipal growth.

Seven (7) service areas have been created for the City and are illustrated in **Figure 1**.


Sefko Planning Group
Freese and Nichols
Urban Planning Consultants - Dallas, Texas
Waxahachie
1
2
3
4
5
6
7
Waxahachie Impact Fee Study
September 5, 2008
Figure 1
Roadway Impact Fee
Service Areas
Legend
City Limits
Roadway Service Areas

# 3.
# Roadway Impact Fee Service Units

An important aspect of the impact fee system is the determination of the proper service unit to be used to calculate and assess impact fees for new developments. As defined in Chapter 395, "Service unit means a standardized measure of consumption, use, generation, or discharge attributable to an individual unit of development in accordance with generally accepted engineering or planning standards for a particular category of capital improvements or facility expansions."

To determine the transportation impact fee for a particular development, the service unit must accurately identify the impact that the development will have on the transportation system serving the development. This impact is a combination of the number of new trips generated by the development, the particular peaking characteristics of the land-use(s) within the development, and the length of each new trip on the transportation system.

The correct service unit must also reflect the supply, which is provided by the roadway system, and the demand placed on the system during the time in which peak, or design, conditions are present on the system. Transportation facilities are designed and constructed to accommodate volumes expected to occur during the peak hours (design hours). These volumes typically occur during the morning (AM) and evening (PM) rush hours as motorists travel to and from work.

The vehicle-mile is recommended as the service unit for calculating and assessing transportation impact fees in Waxahachie. The vehicle-mile as a service unit establishes a way to relate the intensity of land development to the demand on the system through the use of published trip generation data. It also recognizes state legislation requirements with regards to trip length.

The PM peak hour is recommended as the time period for assessing impacts because the greatest demand for roadway capacity occurs during this hour. Roadways are sized to meet this demand, and roadway capacity can more easily be defined on an hourly basis. Traffic volume data collected in April and May 2006 at 25 locations throughout the city confirmed the PM peak (5-6pm) as the highest period of use.

**Service Units**

Service units create a link between supply (roadway projects) and demand (development). Both can be expressed as a combination of the number of vehicles traveling during the peak hour and the distance traveled by these vehicles in miles.

Service Unit Supply

For roadway capital projects improvement, the number of service units provided during the peak hour is simply the product of the capacity of the roadway in one hour and the length of the project. For example:

> Given a four lane divided roadway project with a 600 vehicle per hour per lane capacity and a length of two miles, the number of service units provided is:
>
> *600 vehicles per hour per lane x 4 lanes x 2 miles = 4,800 vehicle-miles*

Service Unit Demand

The demand placed on the system can be expressed in a similar manner. For example, a development generating 100 vehicle trips in the PM peak hour with an average trip length of two miles would generate:

*100 vehicle-trips x 2 miles/trip = 200 vehicle-miles*

Likewise, the existing demand placed on the roadway network is calculated in the same manner with a known traffic volume (peak hour roadway tube counts) on a street and a given segment length.

**Service Units for New Development**

An important objective in the development of the impact fee system is the development of a specific service unit equivalency for individual developments. The vehicle-miles generated by a new development are a function of the trip generation and average trip length characteristics of that development. The following describes the process used to develop the vehicle-equivalency table, which relates land use types and sizes to the resulting vehicle-miles of demand created by that development.

Trip Generation

Trip generation information for the PM peak hour was based on data published in the Seventh Edition of Trip Generation by the Institute of Transportation Engineers (ITE). Trip Generation is a reference publication that contains travel characteristics of over 100 land uses across the nation and is based on empirical data gathered from over 3,200 studies that were reported to the Institute by public agencies, developers and consulting firms. Data contained in this publication is universally accepted for use in studies by transportation engineers throughout the nation. Data not available was drawn from other published information. Rates were established for specific land use types within the broader categories of residential, office, commercial, industrial and institutional land uses. Within each of the land use categories, a rate was also established for any land uses not specifically identified.

Trip Generation contains both rates and equations for estimating trip generation. In some cases the rates and equations yield significantly different estimates. The following process was used as a basis

in selecting between trip generation rates and equations:

- Select most easily projected and verifiable development unit.

- Evaluate stability of rates and equations based on scattered diagrams shown in Trip Generation.

- Check of standard deviation and $R^2$ statistics. An $R^2$ above 0.9 is very good; $R^2$ below 0.7 is not acceptable. Standard deviations above 60% of the mean are poor, although the average for all uses shown in the report is approximately 90% of the mean.

*Adjustments*

The actual "traffic impact" of a specific site for impact fee purposes is based on the amount of traffic added to the street system. To accurately estimate new trips generated by a new development, adjustments must be made to trip generation rates and equations to account for pass-by and diverted trips. The added traffic is adjusted so that each development is assigned only for a portion of trips associated with that particular development and thus reducing the possibility of over-counting by counting only primary trips generated. Trip generation rates were reduced by the percentages presented in Table 1 in an effort to isolate the primary trip purpose.

Pass-by trips are those trips that are already on a particular route for a different purpose and simply stop at a particular development on that route. For example, a stop at a convenience store on the way home from the office is a pass-by trip for the convenience store. A pass-by trip does not create an additional burden on the street system and therefore should not be counted in the assessment of impact fees of a convenience store.

A diverted trip is a similar situation, except that a diversion is made from the regular route to make an interim stop. For example, a trip from work to home using Brown Street would be a diverted trip if the travel path were changed to Dallas Ave. for the purpose of stopping at a retail site. On a system-wide basis, this trip places a slightly additional burden on the street system but in many cases, this burden is minimal.

**Table 1** contains the documented estimates of trip rate adjustments used in determining the appropriate rate to use in the impact fee calculation process. Adjustments were based on studies conducted by ITE and other published studies.

The resulting recommended trip rates are illustrated as part of Land Use/Vehicle Mile Equivalency Table illustrated later in this chapter. Rates were developed in lieu of equations to simplify the assessment of impact fees by the City and likewise, the estimation of impact fees by persons who may be required to pay an impact fee in conjunction with a development project.

**Table 1**
**Trip Reduction Estimates (PM Peak Hour)***

| ITE CODE | LAND USE CATEGORY | UNITS (x) | PERCENT OF PASS-BY TRIPS |
|---|---|---|---|
| 110 | GENERAL LIGHT INDUSTRIAL | 1000 GFA | 0 |
| 130 | INDUSTRIAL PARK | 1000 GFA | 0 |
| 150 | MANUFACTURING | 1000 GFA | 0 |
| 151 | MINI-WAREHOUSING | 1000 GFA | 0 |
| 210 | SINGLE FAMILY DETACHED HOUSING | DU | 0 |
| 220 | APARTMENT | DU | 0 |
| 250 | RETIREMENT COMMUNITY | DU | 0 |
| 530 | HIGH SCHOOL | STUDENT | 0 |
| 540 | JUNIOR/COMMUNITY COLLEGE | STUDENT | 0 |
| 560 | CHURCH/SYNAGOGUE | 1000 GFA | 0 |
| 565 | DAY CARE CENTER | 1000 GFA | 76 |
| 610 | HOSPITAL | BEDS | 0 |
| 710 | GENERAL OFFICE BUILDING | 1000 GFA | 0 |
| 750 | OFFICE PARK | 1000 GFA | 0 |
| 760 | RESEARCH CENTER | 1000 GFA | 0 |
| 815 | DISCOUNT STORE | 1000 GFA | 52 |
| 820 | SHOPPING CENTER | 1000 GFA | 52-73% |
| 831 | QUALITY RESTAURANT | 1000 GFA | 58 |
| 832 | HIGH TURNOVER (SIT-DOWN)REST. | 1000 GFA | 60 |
| 834 | FAST FOOD REST. W/ DRIVE-THRU | 1000 GFA | 59 |
| 843 | AUTO PARTS SALES | 1000 GFA | 43 |
| 844 | SERVICE STATION | 1000 GFA | 87 |
| 848 | TIRE STORE | 1000 GFA | 32 |
| 850 | GROCERY STORE/ SUPERMARKET | 1000 GFA | 61 |
| 851 | CONVENIENCE MARKET | 1000 GFA | 88 |
| 862 | HOME IMPROVEMENT STORE | 1000 GFA | 56 |
| 912 | BANK W/ DRIVE THRU | 1000 GFA | 73 |

DU = DWELLING UNIT
GFA = GROSS FLOOR AREA
(*) Expressed as percent of total PM peak hour trips generated
Source: Trip Generation Handbook, Sixth Edition, October 1998

A local study may also be conducted to confirm rates in Trip Generation or change rates to reflect local conditions. In such cases, a minimum of three sites should be counted. Selected sites should be isolated in nature with driveways that specifically serve the development and not other land uses. The results should be plotted on the scatter diagram of the selected land use contained in Trip Generation for comparison purposes. It is recommended that no change be approved unless the results show a variation of at least fifteen percent across the range of sample sizes surveyed. Trip Generation was used as the primary source of information for this study.

## Trip Length

Trip lengths (in miles) are used in conjunction with site trip generation to estimate vehicle-miles of travel. Trip length data was based on information generated in the 1994 North Central Texas Council of Governments (NCTCOG) Workplace Survey.

**Table 2** summarizes the derived average trip lengths for major land use categories. These trip lengths represent the average distance that a vehicle will travel between an origin and destination of which either the origin or destination contains the land-use category identified below. Data compiled by the Workplace Survey represents the best available information on trip lengths for this area.

**Table 2**
**Average Trip Lengths**

| Land Use Category | Average Trip Length (miles) |
|---|---|
| General Office | 12.06 |
| General Retail | 4.12 |
| Industrial | 10.28 |
| Residential | 11.16 |
| Warehousing | 8.84 |
| Drive-In Bank | 2.62 |
| Hospital | 5.18 |
| Medical Office/Clinic | 9.63 |
| School | 4.12 |
| Hotel | 4.14 |
| Restaurant | 3.79 |

Source: NCTCOG.

*Adjustments*

The assessment of an individual development's impact fee is based on the premise that each vehicle-trip has an origin and a destination and that the development end should pay for one-half of the cost necessary to complete each trip. Thus, the development is charged only for a portion of the vehicle-trip associated with that development.

To prevent double charging, and to fairly attribute the demand placed on the system to each trip end location, the trip length was divided by two to reflect half of the vehicle trip to and from the development and is illustrated in Table 3. Where specific land uses were considered to exhibit different trip length characteristics than those identified in Table 3, engineering judgment was used to estimate the average trip length. Finally, as the service area structure was based on a six-mile boundary, those land uses that exhibited trip lengths greater than six miles would be capped to this threshold.

Service Unit Equivalency Table

The result of combining the trip generation and trip length information is an equivalency table which establishes the service unit rate for various land uses. These service unit rates are based on an appropriate development unit for each land use. For example, a dwelling unit is the basis for residential uses, while 1,000 gross square feet of floor area is the basis for office, commercial, and retail uses. Other less common land uses are based on appropriate independent variables.

Separate rates have been established for specific land uses within the broader categories of residential, commercial, industrial and institutional to reflect the differences between land uses within the categories. However, even with these specific land use types, information is not available for every conceivable land use; so limitations do exist. The recommended equivalency table is illustrated in **Table 3**.

## Table 3
## Land-Use Vehicle-Mile Equivalency Table

| CATEGORY | LAND USE | DEVELOPMENT UNITS (X) | TRIP RATE | LOCAL TRIP LENGTH (mi.) | TOTAL SERVICE UNITS (VEH-MI / DEV UNIT) |
|---|---|---|---|---|---|
| **RESIDENTIAL** | | | | | |
| | SINGLE-FAMILY DETACHED | D.U. | 1.01 | 2.70 | 2.73 |
| | APARTMENT/TOWNHOUSE | D.U. | 0.57 | 2.70 | 1.54 |
| | RETIREMENT COMMUNITY | D.U. | 0.29 | 2.41 | 0.70 |
| | INDEPENDENT SR. LIVING FACILITY | D.U. | 0.26 | 2.41 | 0.62 |
| | OTHERS NOT SPECIFIED* | D.U. | 1.01 | 2.70 | 2.73 |
| **OFFICE** | | | | | |
| | GENERAL OFFICE BLDG | 1000 GFA | 1.49 | 2.84 | 4.24 |
| | CORPORATE HEADQUARTERS BLDG | 1000 GFA | 1.40 | 2.84 | 3.98 |
| | MEDICAL-DENTAL OFFICE BLDG | 1000 GFA | 3.55 | 2.31 | 8.19 |
| | U.S. POST OFFICE | 1000 GFA | 3.26 | 1.92 | 6.25 |
| | BUSINESS PARK | 1000 GFA | 1.29 | 2.84 | 3.67 |
| | RESEARCH AND DEVELOPMENT CENTER | 1000 GFA | 1.02 | 2.84 | 2.90 |
| | OTHERS NOT SPECIFIED* | 1000 GFA | 1.49 | 2.85 | 4.24 |
| **COMMERCIAL** | | | | | |
| | RETAIL/SHOPPING CENTER | 1000 GLA | 2.25 | 0.99 | 2.22 |
| | QUALITY RESTAURANT | 1000 GFA | 3.15 | 0.90 | 2.82 |
| | FAST FOOD RESTAURANT WITH DRIVE-THROUGH | 1000 GFA | 10.34 | 0.84 | 8.74 |
| | HIGH TURNOVER RESTAURANT | 1000 GFA | 4.37 | 0.93 | 4.06 |
| | GAS STATION w/CONVENIENCE MARKET | 1000 GFA | 11.85 | 0.42 | 5.03 |
| | CONVENIENCE MARKET WITH GASOLINE PUMPS | 1000 GFA | 7.27 | 0.42 | 3.09 |
| | GROCERY/SUPERMARKET | 1000 GFA | 4.08 | 0.44 | 1.80 |
| | DISCOUNT CLUB | 1000 GFA | 2.02 | 0.95 | 1.92 |
| | AUTO SALES | 1000 GFA | 1.58 | 1.07 | 1.70 |
| | VIDEO RENTAL STORE | 1000 GFA | 3.67 | 0.68 | 2.52 |
| | BANK | 1000 GFA | 12.35 | 0.63 | 7.77 |
| | PHARMACY/DRUGSTORE WITH DRIVE-THROUGH | 1000 GFA | 3.28 | 0.46 | 1.51 |
| | APPAREL STORE | 1000 GFA | 1.38 | 0.81 | 1.12 |
| | MOVIE THEATER | SCREENS | 11.59 | 0.79 | 9.17 |
| | FURNITURE STORE | 1000 GFA | 0.17 | 1.12 | 0.19 |
| | HOME IMPROVEMENT SUPERSTORE | 1000 GFA | 1.08 | 0.99 | 1.06 |
| | HARDWARE/PAINT STORE | 1000 GFA | 2.13 | 0.38 | 0.82 |
| | BUILDING MATERIALS/LUMBER STORE | 1000 GFA | 1.98 | 0.38 | 0.76 |
| | NURSERY (GARDEN CENTER) | 1000 GFA | 1.67 | 0.63 | 1.05 |
| | NURSERY (WHOLESALE) | 1000 GFA | 1.40 | 0.63 | 0.88 |
| | HOTEL | ROOMS | 0.59 | 0.99 | 0.59 |
| | MOTEL | ROOMS | 0.47 | 0.99 | 0.47 |
| | ALL SUITES HOTEL | ROOMS | 0.55 | 0.99 | 0.55 |
| | AUTO CARE CENTER | 1000 GFA | 2.30 | 0.68 | 1.57 |
| | QUICK LUBE SHOP | 1000 GFA | 2.28 | 0.68 | 1.56 |
| | AUTO PARTS SALES | 1000 GFA | 2.63 | 0.68 | 1.80 |
| | TIRE SUPERSTORE | 1000 GFA | 2.84 | 0.99 | 2.80 |
| | WHOLESALE TIRE STORE | 1000 GFA | 2.16 | 0.99 | 2.13 |
| | MINI-WAREHOUSE/SELF STORAGE | 1000 GFA | 0.26 | 1.52 | 0.39 |
| | OTHERS NOT SPECIFIED* | 1000 GFA | 2.25 | 0.99 | 2.22 |
| **INDUSTRIAL** | | | | | |
| | GENERAL LIGHT INDUSTRIAL | 1000 GFA | 0.71 | 2.38 | 1.69 |
| | MANUFACTURING | 1000 GFA | 0.74 | 2.46 | 1.82 |
| | INDUSTRIAL PARK | 1000 GFA | 0.79 | 2.39 | 1.89 |
| | WAREHOUSING | 1000 GFA | 0.47 | 2.12 | 0.99 |
| | OTHERS NOT SPECIFIED* | 1000 GFA | 0.71 | 2.38 | 1.69 |
| **INSTITUTIONAL** | | | | | |
| | PRIVATE SCHOOL (K-12) | STUDENTS | 0.170 | 0.99 | 0.17 |
| | JUNIOR/COMMUNITY COLLEGE | STUDENTS | 0.120 | 1.01 | 0.12 |
| | UNIVERSITY/COLLEGE | STUDENTS | 0.820 | 1.20 | 0.98 |
| | DAY CARE CENTER | STUDENTS | 0.206 | 0.39 | 0.08 |
| | HOSPITAL | BEDS | 1.300 | 1.24 | 1.61 |
| | NURSING HOME | BEDS | 0.220 | 1.24 | 0.27 |
| | ASSISTED LIVING CENTER | BEDS | 0.220 | 1.24 | 0.27 |
| | PLACE OF WORSHIP | 1000 GFA | 0.660 | 0.59 | 0.39 |

* THIS REPRESENTS TOTAL SERVICE UNIT EQUIVALENCY FOR LAND USES NOT SPECIFIED IN THIS CATEGORY. ACTUAL EQUIVALENCY MAY VARY AND MAY BE DEMONSTRATED BY PROPERTY OWNER TO BE DIFFERENT.

DU = Dwelling Unit
GFA = Gross Floor Area
GLA = Gross Leasable Area

# 4.
# Existing Conditions Analysis

Chapter 395 identifies specific requirements necessary in the capital improvements plan for impact fees. The existing conditions, including defining the existing roadway system, and analysis of the total capacity, the level of current usage, and commitments for usage of the existing roadway, are required as part of the capital improvements plan. This chapter discusses the existing conditions.

## Existing Conditions

An inventory of the collector and arterial roadway facilities was conducted to determine existing conditions throughout Waxahachie. This analysis determines the capacity provided by the existing roadway system, the demand currently placed on the system, and the potential existence of deficiencies on the system. Data for the inventory was obtained from field reconnaissance, traffic volume counts, the City Thoroughfare Plan and City Staff.

The roadways were divided into segments based on volume changes, major intersections, service area boundaries, and capacity changes. For each roadway segment, the length, number of lanes, cross-section, and PM peak hour volume data were obtained. Lane capacities were assigned to each segment based on the type of cross-section and roadway lane capacities. Lane capacities used in the analysis are shown in **Table 4** and reflect hourly volume capacities for Level-of-Service "D" operations.

**Table 4**
**Roadway Facility Vehicle-Mile Lane Capacities**

| Roadway Facility | Designation | Hourly Vehicle-mile Capacity per Lane Mile of Roadway Facility |
|---|---|---|
| Divided Arterial | DA | 625 |
| Divided Collector | DC | 550 |
| Undivided Arterial | UA | 600 |
| Undivided Collector | UC | 500 |

Existing Volumes

Existing directional PM peak hour volumes were obtained from automated traffic counts conducted throughout the city. Automated traffic counts at 53 separate locations were initially collected in November 2006 and supplemented in May 2008 on major roadways (as identified in the Thoroughfare Plan as arterial or collector status) throughout Waxahachie. In an effort to minimize the total number of counts, data was collected at locations where traffic volumes would typify link volumes on the major segments within the immediate area. For segments not counted, existing volume estimates were developed based on data from adjoining roadway counts.

Supplemental counts conducted in May 2008 were collected at previous locations in order to measure relative growth and validate initial data collection efforts. Analysis of the data revealed volume increases that ranged from 3-15%. Where applicable, a growth rate of 5% was applied to 2006 data to yield an estimate of current conditions.

This data was compiled for roadway segments throughout the city and entered into the database for use in calculations. A summary of volumes by roadway segment is included in **Appendix C** as part of the existing capital improvements database.

Vehicle-Miles of Existing Capacity Supply

An analysis of the total capacity for each service area was performed. For each roadway segment, the existing vehicle-miles of capacity supplied were calculated using the following equation:

*Vehicle-Miles of Capacity* = Link capacity per peak hour per lane x No. of Lanes x Length of segment (miles)

A summary of the current capacity available on the roadway system is shown in **Table 5**. It is important to note that the roadway capacity depicted in Table 5 is system-wide for all roadways and not restricted to those roadways proposed in the impact fee capital improvements plan. For a detailed listing of vehicle-miles of capacity by roadway segment, refer to Appendix C.

Vehicle-Miles of Existing Demand

The level of current usage in terms of vehicle-miles was calculated for each roadway segment. The vehicle-miles of existing demand were calculated by the following equation:

*Vehicle-Miles of Demand* = PM peak hour volume x Length of segment (miles)

Table 5 also lists total vehicle-miles of demand. Appendix C includes a detailed listing of vehicle-miles of demand by directional roadway segment.

Vehicle-Miles of Existing Excess Capacity and Deficiencies

For each roadway segment, the existing vehicle-miles of excess capacity and/or deficiencies were calculated. Each direction was evaluated to determine if vehicle demands exceeded the available capacity. If demand exceeded capacity in one or both directions, the deficiency is deducted from the

supply associated with the impact fee capital improvement plan. A summary of peak hour excess capacity and deficiencies are shown in **Table 6**. A detailed listing of the existing excess capacity and deficiencies by roadway segment is also located in Appendix C.

**Table 5**
**Peak Hour Vehicle-Miles of Existing Capacity and Demand**

| Service Area | Capacity | Demand |
|---|---|---|
| 1 | 10,926 | 2,182 |
| 2 | 21,884 | 14,651 |
| 3 | 3,336 | 1,371 |
| 4 | 25,934 | 11,953 |
| 5 | 3,252 | 1,359 |
| 6 | 23,838 | 5,723 |
| 7 | 2,740 | 99 |
| Total | 91,910 | 37,339 |

**Table 6**
**Peak Hour Vehicle-Miles of Excess Capacity and Deficiencies**

| Service Area | Excess Capacity | Existing Deficiencies |
|---|---|---|
| 1 | 8,744 | 0 |
| 2 | 7,262 | 30 |
| 3 | 2,091 | 126 |
| 4 | 14,448 | 468 |
| 5 | 1,893 | 0 |
| 6 | 18,115 | 0 |
| 7 | 2,641 | 0 |
| Total | 55,195 | 624 |

# 5.
# Projected Conditions Analysis

Chapter 395 requires a description of all capital improvements or facility expansions and their costs necessitated by and attributable to new development within the service area. This chapter describes the projected growth, vehicle-miles of new demand, capital improvements program, vehicle-miles of new capacity supplied, and costs of the roadway improvements.

## Projected Growth

The projected growth for each transportation service area is represented by the increase in the number of new vehicle-miles generated over the 10-year planning period. The basis for the calculation of new demand is the population and employment projections that were prepared as part of the Waxahachie Land Use Assumptions Report for Impact Fees by Sefko Planning Group in May 2008. Estimates of population and employment were prepared for the years 2008 and 2018. The Land Use Assumptions for Impact Fees report was heard at a Public Hearing and approved by the Waxahachie City Council on June 16, 2008.

Population data was provided in terms of the number of dwelling units, households and persons. Employment data was broken into three classes of employees; basic, service and retail. These are the typical components used in the traffic forecast modeling process. Waxahachie is comprised of a variety of employment groupings, which have been classified by Standard Industry Classification (SIC) code.

Basic employment (SIC 1,000-5,199) generally encompasses the industrial and manufacturing uses; service employment (SIC 6,000-9,799) encompasses government and office uses; and retail employment (SIC 5,200-5,999) generally includes commercial and retail uses.

## Projected Vehicle-Miles of New Demand

Projected vehicle-miles of demand were calculated based on the growth expected to occur during the 10-year planning period and the service unit generation for each of the population and employment data components (basic, service and retail). Separate calculations were performed for each data component and were then aggregated for the service area. Vehicle-miles of demand for population growth were based on dwelling units, and vehicle-miles of demand for employment were based on the number of employees and estimates of square footage per employee.

**Table 7** lists the projected vehicle-miles of demand over the 10-year planning period for Waxahachie. **Appendix D** contains the projected demand calculation worksheet.

**Table 7**
**Vehicle-Miles of New Demand**

| Service Area | Projected 10-Year Growth (Vehicle-Miles) |
|---|---|
| 1 | 6,053 |
| 2 | 3,732 |
| 3 | 774 |
| 4 | 6,815 |
| 5 | 2,424 |
| 6 | 4,245 |
| 7 | 578 |
| Total | 24,620 |

## Capital Improvements Program

The first step in the development of the roadway impact fee system is the determination of a Capital Improvements Program (CIP). FNI/Sefko Planning Group and City Staff identified the capital improvement program of roadway projects to be constructed based on growth projected to occur over the planning period. Based on the location and projection of growth activity, efforts were made to identify roadway projects that would help to facilitate and provide (access and circulation) for such development.

*Thoroughfare Plan*
Impact fees may only consider "arterial" or "collector" class facilities designated on the City's Thoroughfare Plan. In Waxahachie, arterial class facilities are called "major thoroughfare" and "secondary thoroughfare". A review of the Thoroughfare Plan (adopted October 2007 as part of the Comprehensive Plan Update) identified projects which were eligible for consideration by impact fees. Several types of roadways fell under the "arterial" and "collector" class facilities and are listed below.

**Waxahachie Thoroughfare Plan Sections**

| Arterial | A-1 | A-2 | B | C-1 | C-2 | D-1 | D-2 | D-3 | D-4 |
|---|---|---|---|---|---|---|---|---|---|
| Right-of-Way | 100' | 120' | 100' | 90' | 90' | 80' | 70' | 74' | 64' |
| Collector | E-1 | E-2 | E-3 | - | - | - | - | - | - |
| Right-of-Way | 60' | 60' | 60' | - | - | - | - | - | - |

Roadway projects, which have been completed by the City and are classified as "arterial" or "collector" class facilities are also eligible for recoupment under the impact fee program. Only costs incurred by the City may be considered for impact fees. Roadways constructed with private funding cannot be included for impact fee consideration. Additionally, state facilities are also eligible for inclusion to the impact fee system however, only costs incurred by the City may be eligible for consideration.

*Staff Input and Project Achievability*

City Staff contributed to the identification of potential projects based on historic and projected growth, and known/anticipated development activity within the City. An initial project list was compiled and reviewed with Staff prior to presentation to the CIAC. While many projects were eligible for consideration, special consideration was given to the reasonableness and achievability of specific projects from a cost and timing perspective.

The proposed impact fee capital improvements plan was presented to the CIAC for discussion and consideration over the course of several meetings (May 28, June 11, and June 25, 2008).A Public Hearing on the capital improvements plan was held on August 18, 2008 and culminated with approval by the Waxahachie City Council.

*Capital Improvements Plan*

**Figure 2** and **Table 8** illustrate and lists the proposed capital improvement projects for the impact fee system. The proposed CIP consists of 20 project segments covering all service areas. Of these, three are "recoupment" projects and include; Northgate Drive (existing roadway to Stadium Dr.), Stadium Drive (existing roadway to US 287) and Broadhead Road (US287 to April Lane).

Three projects are located on the state system and include; Ovilla Road (Service Area 1 and Service Area 3), Brown Road (FM 813 in Service Area 2/5), and interchange at US287 (Service Area 6). For these projects, it was assumed that there would be 50% funding participation by the State.

*Cost of CIP*

The cost of the proposed impact fee CIP is $110.5M, and is comprised of $103.1M in new projects and $7.3M recoupment projects. Cost components considered in the derivation of the estimated program cost include; construction, engineering, right-of-way, and debt service. Any previous assessments collected by the city from development (for any of the impact fee projects identified) were netted out of the cost of the program. The cost for impact fee study updates were also included in the program. **Appendix E** details the development of individual cost components of the impact fee CIP.

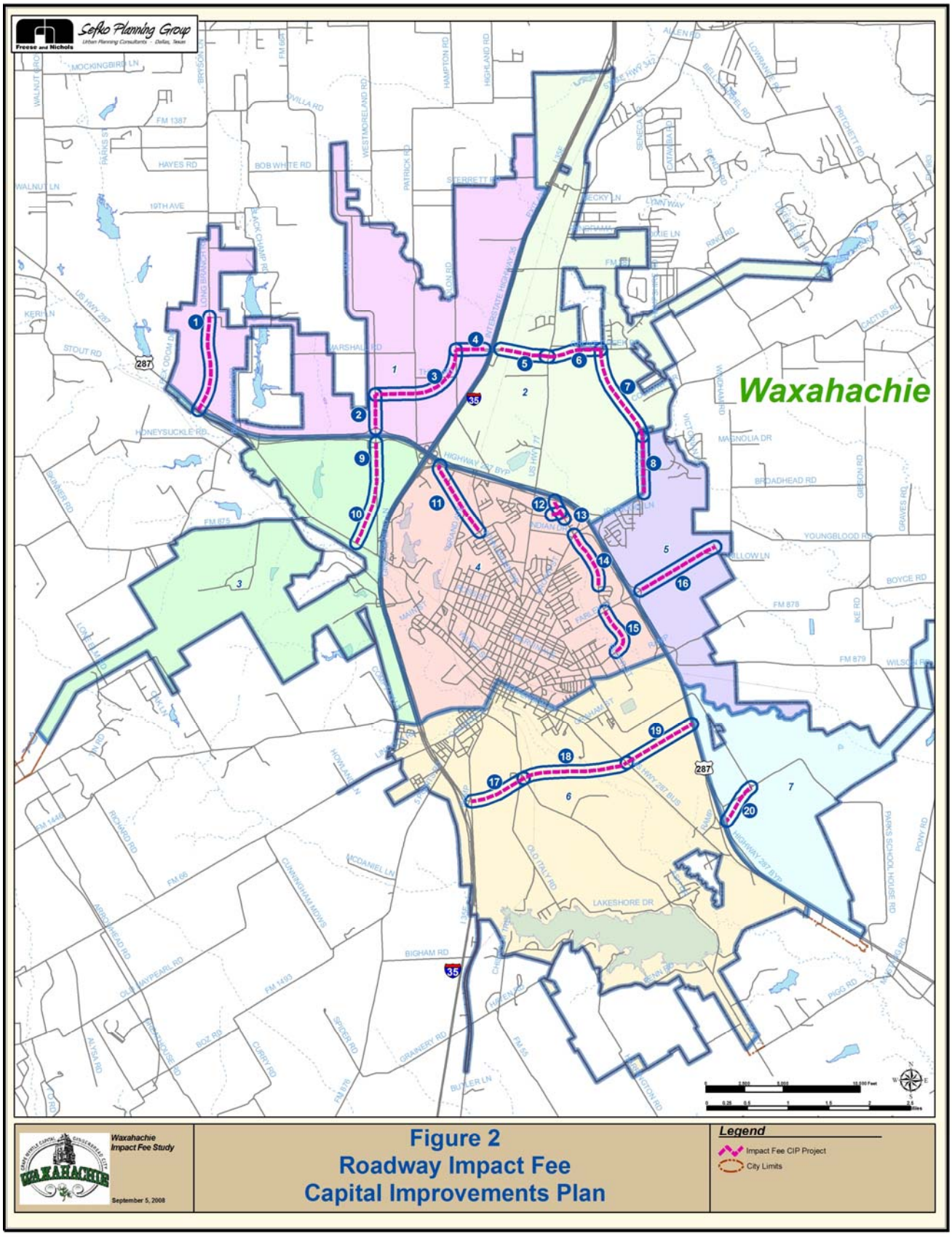

Sefko Planning Group
Freese and Nichols
Urban Planning Consultants – Dallas, Texas
Waxahachie
Waxahachie
Impact Fee Study
September 5, 2008
Figure 2
Roadway Impact Fee
Capital Improvements Plan
Legend
Impact Fee CIP Project
City Limits

**Table 8**
**2008 Waxahachie Roadway Impact Fee Study**
**Roadway Capital Improvements Plan**

*7-Jul-08*

| Serv Area | Reference CIP No. | Roadway | From | To | Length (mi) | No. of Lanes | Type | T'fare Plan Type | Pct. in Serv. Area | Roadway Project Costs | | | | | | Total Project Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | *Engineering** | *ROW* | *Construction* | *Finance** | *Prev. Assmt.* | *Signal* | |
| 1 | *1* | Longbranch Rd | US 287 | Longbranch Rd | 1.18 | 4 | DA | A-2 | 100% | $313,930 | $298,476 | $4,484,719 | $2,675,991 | $0 | $0 | $7,773,116 |
| 1 | *2* | Ovilla Rd*** | US 287 | New Road A (S. of Oregon ) | 0.42 | 4 | DA | A-2 | 100% | $56,304 | $89,220 | $804,344 | $498,681 | $0 | $0 | $1,448,550 |
| 1 | *3* | New Road A | Ovilla Rd. | Loftland | 1.30 | 4 | DA | B | 100% | $311,866 | $275,584 | $4,455,222 | $2,647,402 | $0 | $0 | $7,690,073 |
| 1 | *4* | Lofland | Solon | IH 35 | 0.35 | 4 | UA | B | 100% | $84,107 | $55,742 | $1,201,527 | $704,222 | $0 | $0 | $2,045,597 |
| ***Sub-total SA 1*** | | | | | **3.26** | | | | | **$766,207** | **$719,021** | **$10,945,812** | **$6,526,296** | **$0** | **$0** | **$18,957,336** |
| 2 | *5* | Lofland\Cardinal | IH-35 | US 77 | 0.60 | 4 | DA | B | 100% | $646,034 | $316,275 | $9,229,050 | $5,350,463 | $0 | $0 | $15,541,822 |
| 2 | *6* | Grove Creek Ext | US 77 | New Road B (W. of Brookstone) | 0.69 | 4 | DA | B | 100% | $164,152 | $126,923 | $2,345,035 | $1,383,958 | $0 | $80,000 | $4,100,069 |
| 2 | *7* | New Road B | Grove Creek Ext | Brown Rd (FM 813) | 1.20 | 4 | DA | C | 100% | $232,825 | $200,274 | $3,326,077 | $1,973,568 | $0 | $0 | $5,732,745 |
| 2/5 | *8* | Brown Rd FM 813 | Brown Rd (FM 813) | Brown Rd (FM 813) | 0.68 | 4 | DA | C | 50% | $32,870 | $18,849 | $469,565 | $273,674 | $0 | $0 | $794,958 |
| ***Sub-total SA 2*** | | | | | **3.17** | | | | | **$1,075,881** | **$662,322** | **$15,369,727** | **$8,981,663** | **$0** | **$80,000** | **$26,169,593** |
| 3 | *9* | Ovilla Rd*** | US 287 | Mid-Project | 0.47 | 4 | DA | B | 100% | $56,410 | $99,694 | $805,852 | $505,026 | $0 | $0 | $1,466,981 |
| 3 | *10* | Ovilla Rd*** | Mid-Project | Bus 287 | 0.80 | 4 | DA | B | 100% | $95,931 | $59,340 | $1,370,447 | $801,002 | $0 | $0 | $2,326,720 |
| ***Sub-total SA 3*** | | | | | **1.27** | | | | | **$152,341** | **$159,034** | **$2,176,299** | **$1,306,028** | **$0** | **$0** | **$3,793,701** |
| 4 | *11* | John Arden | US 287 | Solon | 0.96 | 4 | DA | C | 100% | $186,511 | $381,988 | $2,664,441 | $1,697,293 | $0 | $0 | $4,930,233 |
| 4 | *12* | Northgate | Existing | Stadium Dr. | 0.11 | 2 | UC | D | 100% | $13,914 | $0 | $139,140 | $80,353 | $0 | $0 | $233,407 |
| 4 | *13* | Stadium Dr. | Stadium Dr. | US 287 | 0.26 | 2 | UC | D | 100% | $30,834 | $0 | $308,336 | $178,064 | $0 | $0 | $517,233 |
| 4 | *14* | River Oaks | Brown | River Oaks | 0.71 | 2 | UC | D | 100% | $187,950 | $138,297 | $1,879,502 | $1,158,018 | $0 | $0 | $3,363,767 |
| 4 | *15* | River Oaks/Marvin Connection | Farley | Marvin Ave. | 0.60 | 2 | UC | D | 100% | $179,684 | $81,980 | $1,796,836 | $1,080,712 | $0 | $0 | $3,139,212 |
| ***Sub-total SA 4*** | | | | | **3.24** | | | | | **$598,892** | **$602,265** | **$6,788,254** | **$4,194,440** | **$0** | **$0** | **$12,183,851** |
| 5/2 | *8* | Brown Rd (FM 813) *** | Brown Rd (FM 813) | Brown Rd (FM 813) | 0.68 | 4 | DA | C | 50% | $32,870 | $18,849 | $469,565 | $273,674 | $0 | $0 | $794,958 |
| 5 | *16* | Broadhead | US 287 | April Lane | 1.02 | 4 | DA | C | 100% | $320,000 | $750 | $3,980,138 | $2,257,966 | ($50,111) | $80,000 | $6,588,743 |
| ***Sub-total SA 5*** | | | | | **1.70** | | | | | **$352,870** | **$19,599** | **$4,449,703** | **$2,531,640** | **($50,111)** | **$80,000** | **$7,383,701** |
| 6 | *17* | New Road C - Segment 1 | US 77 | Howard | 0.71 | 4 | DA | C | 100% | $137,146 | $117,972 | $1,959,233 | $1,162,534 | $0 | $80,000 | $3,456,885 |
| 6 | *18* | New Road C - Segment 2 | Howard | Bus 287 | 1.29 | 4 | DA | C | 100% | $995,668 | $214,948 | $14,223,824 | $8,103,081 | $0 | $0 | $23,537,520 |
| 6 | *19* | New Road C - Segment 3 *** | Bus 287 | US 287 | 0.93 | 4 | DA | C | 100% | $482,752 | $154,400 | $6,896,461 | $3,955,147 | $0 | $0 | $11,488,760 |
| ***Sub-total SA 6*** | | | | | **2.93** | | | | | **$1,615,566** | **$487,319** | **$23,079,517** | **$13,220,762** | **$0** | **$80,000** | **$38,483,165** |
| 7 | *20* | New Road D | US 287 | Park School House | 0.52 | 4 | DA | A | 100% | $137,325 | $163,205 | $1,961,783 | $1,187,715 | $0 | $0 | $3,450,029 |
| ***Sub-total SA 6*** | | | | | **0.52** | | | | | **$1,752,891** | **$650,525** | **$1,961,783** | **$1,187,715** | **$0** | **$0** | **$3,450,029** |
| | | | | | **15.41** | | | | | **$6,314,648** | **$3,300,085** | **$64,771,096** | **$37,948,544** | **($50,111)** | **$240,000** | **$110,421,376** |

**Totals:**

| | |
|---|---|
| Engineering Cost | $6,314,648 |
| Right-of-Way Cost | $3,300,085 |
| Construction Cost | $64,771,096 |
| Traffic Signals | $240,000 |
| Finance Cost | $37,948,544 |
| Previous Assessments | ($50,111) |
| TOTAL NET COST | $110,421,376 |
| Future Impact Fee Update Cost ** | $70,000 |
| TOTAL IMPLEMENTATION COST | $110,491,376 |

File: Waxhachie Impact Fee\Dbase\dbase7.xls

**Notes:**

* Assumes 7% cost of construction, interest rate for debt service @ 5% over 20 years.
** Assumes two 5-year updates at $35,000 each; cost spread over service areas.
*** TXDOT Participation at 50%.

DA- Divided arterial
DC- Divided collector
UC- Undivided collector

N - New Project
R - Recoupment project

Projected Vehicle-Miles Capacity Available for New Growth

The vehicle-miles of new capacity supply were calculated similar to the vehicle-miles of existing capacity supplied. The equation used was:

*Vehicle-Miles of New Capacity Supplied* = Link capacity per peak hour per lane x Num. of lanes within Service Area x Length of segment (miles)

Vehicle-miles of new supply provided by the CIP are listed in **Table 9**. While the project has not been built, there are system deficiencies (by service area) that have been removed from the total supply to properly account for new "net" availability. Table 9 depicts net availability of supply by the CIP. **Appendix F** details capacity calculations provided by the CIP program.

**Table 9**
**Vehicle-Miles of New Capacity Supplied**

| Service Area | Vehicle-Miles of New Capacity Supplied | Vehicle-Miles of Net Capacity Supplied |
|---|---|---|
| 1 | 8,107 | 7,795 |
| 2 | 7,075 | 6,878 |
| 3 | 3,187 | 2,988 |
| 4 | 4,085 | 3,203 |
| 5 | 4,262 | 3,451 |
| 6 | 7,325 | 7,325 |
| 7 | 1,288 | 1,288 |
| **Totals** | **35,328** | **32,928** |

Cost of Roadway Improvements

The total and net cost to implement the roadway improvements plan projects by service area is shown **in Table 10**. If traffic exists on proposed CIP project roadways or there are any deficiencies present in each respective service area, the total system cost is adjusted to reflect the net capacity being made available by the impact fee program. In other words, only the unused portion of the CIP and its associated costs are considered eligible. A detailed listing by project segment in each service area can be found in **Appendix G**. **Appendix H** details system costs by service area.

**Table 10**
**Summary of Roadway Improvements Plan Cost Analysis**

| Service Area | Actual Cost of Proposed IFCIP Projects | Adjusted Cost (50% credit) of Proposed IFCIP Projects |
|---|---|---|
| 1 | $18,973,399 | $9,486,700 |
| 2 | $26,183,611 | $13,091,806 |
| 3 | $3,800,016 | $1,900,008 |
| 4 | $12,191,945 | $6,095,972 |
| 5 | $7,392,146 | $3,696,073 |
| 6 | $38,497,679 | $19,248,839 |
| 7 | $3,452,580 | $1,726,290 |
| **Totals** | $110,491,376 | $55,245,688 |

State law is specific in identifying that only the portion of the CIP necessitated and attributable to new development is eligible for cost recovery. For example, if only 60% of the net service units supplied by the CIP are needed in the next 10 years, only 60% of the cost (credited at 50% per legislative requirements) may be considered in the calculation of fees. All of the capacity being made available by the impact fee CIP will be necessitated to address future growth over the 10-year planning period. The cost attributable to new growth is $38.5 million and represents the cost attributable to new growth to implement projects on the impact fee program. **Table 11** depicts CIP costs attributable to new growth by service area.

**Table 11**
**Capital Improvements Plan Costs Attributable to New Development**

| Service Area | Actual Cost Attributable to New Growth | Adjusted Cost (50% credit) Attributable to New Growth |
|---|---|---|
| 1 | $14,165,319 | $7,082,659 |
| 2 | $13,812,128 | $6,906,064 |
| 3 | $922,493 | $461,246 |
| 4 | $9,561,722 | $4,780,861 |
| 5 | $4,203,920 | $2,101,960 |
| 6 | $22,307,602 | $11,153,801 |
| 7 | $1,549,466 | $774,733 |
| **Totals** | 76,999,514 | $38,499,757 |

# 6.
# Calculation of Impact Fees

This chapter discusses the calculation of the cost per service unit and the calculation of roadway impact fees. The transportation impact fee will vary by the particular land use, service area, and size of the development. Examples are included to better illustrate the method by which the transportation impact fees are calculated.

Cost Per Service Unit

The cost per service unit is calculated by dividing the cost of the CIP necessitated and attributable to new demand (net cost) by the projected service units of growth over the 10-year planning period.

Generally, the cost per service unit varies by service area because of; the net capacity being provided by the proposed projects, variations in cost of CIP and, the number of service units necessitated by new growth in each impact fee service area. Where net capacity supplied is greater than demand, the cost per service unit is simply the cost of the net capacity divided by the number of service units provided. In this case, only the portion of the CIP necessitated by new development is used in the calculation. If net capacity supplied is *less* than projected new demand, then the cost per service unit is calculated by dividing the total cost of net supply by the portion of new demand attributable and necessary by development. The result is generally a decrease in the cost per service unit, because such cost is spread over the larger number of service units of growth.

**Table 12** lists the results of the cost per service unit calculation by service area. The actual cost per service unit reflects the true burden to the City for the implementation of the roadway capital improvements program. As per state law, a credit for the portion of ad-valorem tax revenues generated by improvements over the program period, or a credit equal to 50% of the total projected cost of implementing the capital improvements plan must be given. Based on this analysis, the maximum collection rate reflects the maximum amount per service unit that can be charged to be in compliance with the state statute. **Appendix H** details the maximum fee per service unit calculation for each service area.

**Table 12**
**Cost Per Service Unit Summary**

| Service Area | Actual Cost Per Service Unit | Maximum Allowable (50%) Cost per Service Unit |
|---|---|---|
| 1 | $2,340.00 | $1,170.00 |
| 2 | $3,700.00 | $1,850.00 |
| 3 | $1,192.00 | $596.00 |
| 4 | $1,402.00 | $701.00 |
| 5 | $1,734.00 | $867.00 |
| 6 | $5,254.00 | $2,627.00 |
| 7 | $2,680.00 | $1,340.00 |
| **Average** | $3,126.00 | $1,563.00 |

## Calculation of Roadway Impact Fees

The calculation of roadway impact fees for new development involves a two-step process. *Step One* is the calculation of the total number of service units that will be generated by the development. *Step Two* is the calculation of the impact fee due by the new development.

*Step 1:* Determine number of service units (vehicle-miles) generated by the development using the equivalency table.

| No. of Development Units | x | Vehicle-miles per development unit | = | Development's Vehicle-miles |
|---|---|---|---|---|

*Step 2:* Calculate the impact fee based on the fee per service unit for the service area where the development is located.

| Development's Vehicle-miles | x | Fee per vehicle-mile | = | Impact Fee due from Development |
|---|---|---|---|---|

*Examples: The following fees would be assessed to new developments in Waxahachie if the cost per service unit in Service Area 4 were $701.00 (assumed adoption of 50%).*

Single-Family Dwelling
1 dwelling unit x 2.73 vehicle-miles/dwelling unit = 2.73 vehicle-miles
2.73 vehicle-miles x $701.00/vehicle-mile = $1,488.24

20,000 square foot (s.f.) Office Building
20 (1,000 s.f. units) x 4.24 vehicle-miles/1,000 s.f. units = 84.80 vehicle-miles
84.80 vehicle-miles x $701.00/vehicle-mile = $59,444.80

100,000 s.f. Retail Center
100 (1,000 s.f. units) x 2.22 vehicle-miles/1,000 s.f. units = 222.00 vehicle-miles
222.00 vehicle-miles x $701.00/vehicle-mile = $155,622.00

# 7.
# Conclusions

Chapter 395 authorizes the assessment and collection of impact fees in Texas for transportation related capital improvements that must be met in order to assess and collect impact fees. This study was conducted to fulfill the requirements of Chapter 395 in developing a transportation-related impact fee for the City of Waxahachie.

Seven service areas were created for Waxahachie. This service area structure was configured so that no point is greater than the six-mile maximum set forth by law. The six-mile limit ensures that roadway improvements are in close proximity to the development paying the fees that it serves.

Vehicle-miles of travel in the PM peak hour are used as the service unit for calculating and assessing impact fees. Vehicle-miles establish a relationship between the intensity of land development and the demand on the roadway system through the use of published trip generation data and average trip length. The PM peak hour is used as the time period for assessment because typically the greatest demand for roadway capacity occurs during this hour. Additionally, roadways are sized to meet this demand and roadway capacity can more accurately be defined on an hourly basis.

The service units (vehicle-miles) for new development are a function of trip generation and the average trip length for specific land uses. Trip generation information was based on data published by the Institute of Transportation Engineers as reported in the initial study. Where appropriate, trip generation rates were adjusted to reflect the primary trip purpose. This ensures that new development is assigned for the portion of trips associated with that specific development. Average trip length data was based on information compiled by NCTCOG and based on data from the 1994 NCTCOG Workplace Survey.

The result of combining trip generation and trip length information is an equivalency table that establishes a service unit rate for various land uses. Separate rates were established for specific land uses within the broader categories of residential, community, industrial and institutional uses.

An analysis of existing conditions revealed that the current roadway system provides over 91,910 vehicle-miles of capacity. The existing demand placed on the system was determined to be 37,339 vehicle-miles. Evaluation of the existing roadway system found 624 vehicle-miles of deficiencies on the existing roadway network.

Projected growth, in terms of vehicle-miles over the 10-year planning period, was based on population

and employment data that was prepared in the Land Use Assumptions for Impact Fees report dated May 15, 2008. Based on this growth, the projected vehicle-miles of demand calculated to be 24,620.

FNI/Sefko Planning Group and Waxahachie City Staff developed the roadway impact fee capital improvements program for the 10-year planning period. Projects eligible for this CIP include arterial and collector streets that have been designated on the officially adopted Thoroughfare Plan of the City. Developer funded roadways are not eligible for inclusion in calculating impact fees. Twenty project segments, totaling $100.5 million, was identified for impact fee consideration based on need, projected growth, project affordability and achievability, financial considerations, jurisdictional issues, the Thoroughfare Plan, and staff recommendation. The credited (50%) cost attributable to new growth is $55.2 million and represents 100% of the net capacity made available for development by impact fee roadway projects. The recommended CIP program will provide 32,928 vehicle-miles of new net capacity.

The *actual* cost per service unit was calculated to be between $1192.00 and $5,254.00 and was based on the total cost of net capacity supplied by the CIP and the demand attributable to new development over the 10-year planning period. State legislation requires that a credit for the portion of ad-valorem tax revenues generated by improvements over the program period, or a credit equal to 50% of the total projected cost of implementing a roadway impact fee capital improvements program be given. Based on a 50% credit, the cost per service unit ranges between $596.00 and $2,627.00.

The determination of fees due from new development is based upon the size of development, its associated service unit generation (equivalency table) and the cost per service unit derived or adopted for each service area.

# APPENDICES

# A. Roadway Impact Fee Definitions

# ROADWAY IMPACT FEE DEFINITIONS

**Average Trip Length** - the average actual travel distance between two points. The average trip length by specific land use varies.

**Diverted Trip** - similar to pass-by trip, but a diversion is made from the regular route to make an interim stop.

**Impact Fee** - a charge or assessment imposed by a city against new development to generate revenue for funding or recouping roadway improvements necessitated and attributable to new development.

**Maximum Fee Per Service Unit** - the highest impact fee that may be collected by the City per vehicle-mile of supply. Calculated by dividing the costs of the capital improvements by the total number of vehicle-miles of demand expected in the 10-year planning period.

**Pass-by Trip** - a trip made as an intermediate stop on the way from an origin to a primary trip destination. For example, a stop at a convenience store on the way to office from home.

**PM Peak Hour** - the hour when the highest volume of traffic typically occurs. Data collection (September 2001) revealed the peak hour of travel between 5:00 and 6:00 pm for Waxahachie.

**PM Peak Hour Traffic Counts** - the number of vehicles passing a certain point during the peak hours of travel. Traffic counts are conducted during the PM peak hour because the greatest demand for roadway capacity occurs during this hour.

**Primary Trip** - a trip made for the specific purpose of visiting a destination; for example, from home to office.

**Roadway Demand** - the demand placed on the roadway network as a result of development. Determined by multiplying the trip generation of a specific land use by the average trip length.

**Roadway Supply (or Capacity)** - the number of service units provided by a segment of roadway over a period of time. Determined by multiplying the lane capacity by the roadway length.

**Service Area** - the area within the city boundaries to be served by capital improvements. Criteria for developing the service area structure include; 1) restricted to six-mile limit by legislation (to ensure proximity of roadway improvements to development), 2) conforms to census or forecast model boundaries, 3) projects on CIP as boundaries, 4) effort to match roadway supply with projected demand, or 5) city limit boundaries.

**Service Unit** - a measure of use or generation attributable to new development for roadway improvements. Also used to measure supply provided by existing and proposed roadway improvements.

**Trip** - a single, one-direction vehicle movement from an origin to a destination.

**Trip Generation** - the total trip ends for a land use over a given period of time or the total of all trips entering and exiting a site during that designated time. Used in the development of 10-year traffic demand projections and the equivalency table for Waxahachie. Based primarily on data prepared by the Institute of Transportation Engineers (ITE).

**Vehicle** - for impact fee purposes, any motorized appurtenance that carries passengers and/or goods on the roadway system during peak periods of travel.

**Vehicle-mile** - a unit used to express both supply and demand provided by, and placed on, the roadway system. A combination of a number of vehicles traveling during a given time period and the distance in which these vehicles travel in miles.

# B. Land Use Definitions

# LAND USE DEFINITIONS

## *Residential*

Single-Family Detached - Any single-family detached home on an individual lot is included in this category. A typical example of this land use is a home in a suburban subdivision. Also included are duplex residential units and manufactured homes and other residential land uses not specified above.

Multi-Family - This land use includes both low-rise ("walk-up" dwellings) and high-rise multi-family apartments. An apartment is defined as a dwelling unit that is located within the same building with three or more dwelling units. Also included in this land use are residential condominiums, townhomes, triplex and quadplex units. Residential condominiums and townhomes are defined as single-family units that have at least one other single-family unit within the same building structure.

Independent Senior Living Facility - Retirement communities - restricted to adults or senior citizens - contain residential units similar to apartments or condominiums, and are usually self-contained villages. They may also contain special services such as medical facilities, dining facilities, and some limited supporting retail facilities.

## *Office*

General Office Building - A general office building houses one or more tenants and is the location where affairs of a business, commercial or industrial organization, and professional activity are conducted. The building or buildings may be limited to one tenant or contain a mixture of tenants including professional services, insurance companies, investment brokers, company headquarters, and services for the tenants such as a bank or savings and loan, a restaurant or cafeteria, and several retail facilities. Also included in this category are office parks, and other office uses not specified above.

Medical Office Building – A building that provides diagnoses and outpatient care on a routine basis but is unable to provide prolonged in-house medical and surgical care. One or more private physicians or dentists generally operate this type of facility.

## *Commercial/Retail*

General Retail – General retail includes a variety of land uses that include shopping centers, home improvement stores, hardware stores selling a complete assortment of food, household goods and materials, apparel, servicing items. A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. It is related to its market area in terms of size, location, and type of store. Shopping centers provide on-site parking facilities. Some centers may include non-merchandising uses such as small office professional services, post offices, banks, health clubs, video rentals, and recreational facilities such as ice-skating rinks or video arcades.

Restaurant - This land use consists of sit-down eating establishments. Quality and high-turnover (sit-down) restaurants are included in this category. Quality restaurants usually have a turnover

rate of at least one hour or longer. The turnover rate for a high-turnover (sit-down) restaurant is usually less than one hour.

Fast Food Restaurant - This category includes fast food restaurants with or without drive-through windows, such as McDonalds, Burger King, Dunkin Donuts, and Taco Bell. Some establishments may include an indoor or outdoor playground.

Convenience Store/Gas Station - Any convenience market that sell convenience foods, newspapers, magazines, and often, beer and wine and may have gasoline pumps. Gas stations generally are located at intersections or freeway interchanges and may include facilities for servicing, repairing, fueling motor vehicles and also may have convenience stores. Convenience stores/gas stations that have a fast-food restaurant contained within should be calculated on a separate basis based on the appropriate independent variable.

Bank - This land use includes walk-in and drive-in banks. Walk-in banks are generally free-standing buildings with their own parking lots. These banks do not have drive-in windows. Drive-in banks provide banking facilities for the motorist while in a vehicle; many also serve patrons who walk into the building. Savings and loan companies should also be included in this category.

Hotel/Motel – A place of lodging that provides sleeping accommodations, small restaurants, lounges, and meeting spaces. Some hotels or motels may provide banquet rooms or other retail and service shops.

Furniture and Appliance Sales - A store specializing in the sale of furniture, household appliances and goods and often, carpeting.

Theater – This land use consists of a movie or live theater and contains audience seating, single or multiple auditoriums, lobby, offices and refreshment stands.

Self-Storage Facilities - A self serve storage unit or vault that is rented for the storage of goods. Each unit is physically separated from other units and access is usually provided through an overhead door or other common access point.

***Industrial***

General Industrial – General industrial includes a variety of land uses such as light industrial, manufacturing, salvage, facilities for preparation/assembly and warehouse/distribution of goods. Other uses include materials testing laboratories, high-tech facilities and assemblers of technical equipment. Most facilities are free standing and devoted to a single use. Also included in this category are any other industrial uses not specified above.

Manufacturing – Facilities where the primary activity is the conversion or fabrication of raw materials to finished products. In addition to production of goods, manufacturing facilities may also have ancillary office, warehouse and associated functions.

Warehousing – These facilities are primarily devoted to the storage of materials. These facilities differ from mini-warehouse in that they are generally not self-service in nature.

***Institutional***

Private School - Private schools serve students between the kindergarten and middle school or high school levels. Private schools are usually centrally located in residential communities in order to facilitate student access and have no student drivers.

Community College - Community college provides two and four year advanced degrees. Vocational and technical schools are other uses that may fall under this category.

Day Care Center - A day care center is a facility where care for pre-school age children is provided, normally during the daytime hours. Day care facilities generally include classrooms, offices, eating areas, and playgrounds. Some centers also provide after-school care for older children.

Hospital - A hospital is any institution where medical or surgical care is given to non-ambulatory and ambulatory patients, and overnight accommodations are provided.

Nursing Home - A nursing home is any facility whose primary purpose is to care for persons who are unable to care for themselves. The term applies to rest homes, chronic care, and convalescent homes.

Religious Facilities – Churches, synagogues or houses of worship that provide public worship services, and generally houses an assembly hall or sanctuary, meeting rooms, classrooms, and occasionally dining, catering, or party facilities.

Activity Centers – A recreational center or private club such as a YMCA that may offer classes and clubs for adults and children; a day care or a nursery school, meeting rooms, swimming pools and whirlpools; saunas, tennis, racquetball and handball courts, exercise classes, weightlifting equipment and locker rooms. Some may offer a small restaurant or snack bar within.

U.S. Post Office – A building that contains service windows for mailing packages and letters, post office boxes, offices, sorting and distributing facilities for mail and vehicle storage areas.

# C. Existing Capital Improvements

## EXISTING CAPITAL IMPROVEMENTS

### Definitions

| | |
|---|---|
| LANES | The total number of lanes in both directions available for travel. |
| TYPE | The type of roadway (used in determining capacity):<br><br>DA = divided arterial<br>UA = undivided arterial<br>UC = undivided collector |
| PK-HR VOLUME | The existing volume of cars on the roadway segment traveling during the afternoon (P.M.) peak hour of travel. A and B indicate the two directions of travel. Direction A is a northbound or eastbound and direction B is southbound or westbound. If only one half of the roadway is located within the service area (see % in service area), the opposing direction will have no volume in the service area. |
| % IN SERVICE AREA | If the roadway is located on the boundary of the service area (with the city limits running along the centerline of the roadway), then half of the roadway is inventoried in the service area and the other half is not. This value is either 50% or 100%. |
| VEH-MI SUPPLY PK-HR | The number of total service units (vehicle-miles) supplied within the service area, based on the length and established capacity of the roadway type. |
| VEH-MI TOTAL DEMAND PK-HR | The total service unit (vehicle-mile) demand created by existing traffic on the roadway segment in the afternoon peak hour. |
| EXCESS CAPACITY PK-HR VEH-MI | The number of service units supplied but unused by existing traffic in the afternoon peak hour. |
| EXISTING DEFICIENCIES PK-HR VEH-MI | The number of service units of demand in excess of the service units supplied. |

NOTE: Excess capacity and existing deficiencies are calculated separately for each direction. It is possible to have excess capacity in one direction and an existing deficiency in the other. When both directions have excess capacity or deficiencies, the total for both directions are presented.

## Waxahachie Roadway Impact Fee Study
## Existing Capital Improvements Analysis

| Serv Area | Shared Svc Area | Roadway | From | To | Length (mi) | No. of Lanes | Type | Lane Capacity | Pct. in Serv. Area | Peak Hour Volume A | Peak Hour Volume B | Peak Hour Volume Total | VMT Supply A Dir Pk Dir | VMT Supply B Dir Pk Dir | VMT Supply Pk Hr Total | VMT Demand Pk Hr Total | Total VMT Excess Capacity | Total VMT Deficiency |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | PATRICK | US 287 | MARSHALL | 1.12 | 2 | UC | 500 | 100% | 106 | 11 | 117 | 560 | 560 | 1120 | 131 | 989 | 0 |
| 1 | | PATRICK | MARSHALL | N CITY LIMIT | 1.14 | 2 | UC | 500 | 100% | 106 | 11 | 117 | 570 | 570 | 1140 | 133 | 1007 | 0 |
| 1 | 2 | HIGHLAND | US 287 | N CITY LIMIT | 0.74 | 2 | UC | 500 | 50% | 0 | 75 | 75 | 0 | 370 | 370 | 55 | 315 | 0 |
| 1 | | OVILLA (FM 664) | US 287 | MARSHALL | 0.93 | 2 | UA | 600 | 100% | 229 | 208 | 438 | 558 | 558 | 1116 | 407 | 709 | 0 |
| 1 | | OVILLA (FM 664) | MARSHALL | BOB WHITE | 2.60 | 2 | UA | 600 | 100% | 229 | 208 | 438 | 1560 | 1560 | 3120 | 1138 | 1982 | 0 |
| 1 | | MARSHALL | PATRICK | OVILLA (FM 664) | 0.50 | 2 | UC | 500 | 100% | 15 | 12 | 26 | 250 | 250 | 500 | 13 | 487 | 0 |
| 1 | | MARSHALL | OVILLA (FM 664) | BLACK CHAMP | 1.34 | 2 | UC | 500 | 100% | 36 | 22 | 58 | 670 | 670 | 1340 | 78 | 1262 | 0 |
| 1 | | LONGBRANCH | BLACK CHAMP | N CITY LIMIT | 1.85 | 2 | UA | 600 | 100% | 67 | 55 | 122 | 1110 | 1110 | 2220 | 226 | 1994 | 0 |
| ***Sub-Total*** | | | | | *10.22* | | | | | | | | | | *10,926* | *2,182* | *8,744* | *0* |
| 2 | 1 | HIGHLAND | IH 35 | N CITY LIMIT | 1.17 | 2 | UC | 500 | 50% | 33 | 0 | 33 | 585 | 0 | 585 | 38 | 547 | 0 |
| 2 | | W. STERRETT | IH 35 | US 77 | 0.33 | 2 | UC | 500 | 50% | 99 | 63 | 162 | 165 | 165 | 330 | 53 | 277 | 0 |
| 2 | | BUTCHER (FM 387) | IH 35 | US 77 | 0.43 | 2 | UA | 600 | 100% | 185 | 243 | 428 | 258 | 258 | 516 | 184 | 332 | 0 |
| 2 | | BUTCHER (FM 387) | US 77 | COVENTRY | 0.71 | 2 | UA | 600 | 100% | 497 | 275 | 772 | 426 | 426 | 852 | 548 | 304 | 0 |
| 2 | | GROVE CREEK | US 77 | BROOKBEND DR | 0.82 | 2 | UA | 600 | 100% | 127 | 80 | 207 | 492 | 492 | 984 | 170 | 814 | 0 |
| 2 | 5 | BROWN | US 287 | SPRING CREEK | 0.80 | 2 | UA | 600 | 50% | 0 | 259 | 259 | 0 | 480 | 480 | 207 | 273 | 0 |
| 2 | 5 | BROWN | SPRING CREEK | E CITY LIMIT | 0.69 | 2 | UA | 600 | 50% | 0 | 211 | 211 | 0 | 414 | 414 | 145 | 269 | 0 |
| 2 | | US 77 | IH 35 | SH 342 | 1.02 | 4 | UA | 600 | 100% | 406 | 701 | 1107 | 1224 | 1224 | 2448 | 1129 | 1319 | 0 |
| 2 | | US 77 | SH 342 | STERRETT | 0.97 | 5 | SA | 625 | 100% | 406 | 701 | 1107 | 1213 | 1213 | 2425 | 1074 | 1351 | 0 |
| 2 | | US 77 | STERRETT | BUTCHER (FM 387) | 0.97 | 5 | SA | 625 | 100% | 549 | 905 | 1455 | 1213 | 1213 | 2425 | 1411 | 1014 | 0 |
| 2 | | US 77 | BUTCHER (FM 387) | GROVE CREEK | 1.50 | 5 | SA | 625 | 100% | 992 | 1214 | 2205 | 1875 | 1875 | 3750 | 3308 | 442 | 0 |
| 2 | | US 77 | GROVE CREEK | YMCA | 0.68 | 5 | SA | 625 | 100% | 1119 | 1294 | 2413 | 850 | 850 | 1700 | 1641 | 89 | 30 |
| 2 | 3 | US 77 | YMCA | US 287 | 1.99 | 5 | SA | 625 | 100% | 1195 | 1188 | 2383 | 2488 | 2488 | 4975 | 4742 | 233 | 0 |
| ***Sub-Total*** | | | | | *12.08* | | | | | | | | | | *21,884* | *14,651* | *7,262* | *30* |
| 3 | | OVILLA (FM 664) | US 287 | Bus 287 | 1.38 | 2 | UA | 600 | 100% | 76 | 86 | 162 | 828 | 828 | 1656 | 224 | 1432 | 0 |
| 3 | | Bus 287 | OVILLA (FM 664) | FM 875 (LONE ELM) | 0.91 | 2 | UA | 600 | 100% | 316 | 369 | 685 | 546 | 546 | 1092 | 624 | 468 | 0 |
| 3 | | Bus 287 | FM 875 (LONE ELM) | US 287 | 0.37 | 2 | UA | 600 | 100% | 316 | 369 | 685 | 222 | 222 | 444 | 254 | 190 | 0 |
| 3 | 6 | FM 1446 (CANTRELL) | IH 35 SBFR | W. CITY LIMITS | 0.24 | 2 | UA | 600 | 50% | 1126 | 0 | 1126 | 144 | 0 | 144 | 270 | 0 | 126 |
| ***Sub-Total*** | | | | | *2.90* | | | | | | | | | | *3,336* | *1,371* | *2,091* | *126* |
| 4 | | US 77 (Dallas Hwy) | US 287 | MARK TRAIL | 0.18 | 5 | SA | 625 | 100% | 1429 | 1285 | 2715 | 225 | 225 | 450 | 489 | 0 | 39 |
| 4 | | US 77 (Dallas Hwy) | MARK TRAIL | NORTHGATE | 0.05 | 5 | SA | 625 | 100% | 1417 | 1194 | 2610 | 63 | 63 | 125 | 131 | 3 | 8 |
| 4 | | US 77 (Dallas Hwy) | NORTHGATE | INDIAN | 0.20 | 4 | SA | 625 | 100% | 1387 | 1353 | 2740 | 188 | 188 | 375 | 548 | 0 | 173 |
| 4 | | US 77 (Dallas Hwy) | INDIAN | E. UNIVERSITY | 0.41 | 4 | SA | 625 | 100% | 1266 | 1202 | 2468 | 384 | 384 | 769 | 1012 | 0 | 243 |
| 4 | | US 77 (Dallas Hwy) | E. UNIVERSITY | LA VISTA | 0.21 | 4 | DA | 625 | 100% | 1205 | 1055 | 2260 | 263 | 263 | 525 | 475 | 50 | 0 |
| 4 | | US 77 (Dallas Hwy) | LA VISTA | JOHN ARDEN | 0.26 | 4 | UA | 600 | 100% | 1102 | 984 | 2086 | 312 | 312 | 624 | 542 | 82 | 0 |
| 4 | | US 77 (Dallas Hwy) | JOHN ARDEN | SYCAMORE | 0.11 | 4 | UA | 600 | 100% | 1118 | 872 | 1989 | 132 | 132 | 264 | 219 | 45 | 0 |
| 4 | | US77 (Ferris Ave.) | SYCAMORE | ROSS | 0.10 | 4 | UA | 600 | 100% | 986 | 893 | 1879 | 120 | 120 | 240 | 188 | 52 | 0 |
| 4 | | US77 (Ferris Ave.) | ROSS | MARVIN | 0.26 | 4 | UA | 600 | 100% | 949 | 725 | 1675 | 312 | 312 | 624 | 435 | 189 | 0 |
| 4 | | US 77 (Elm St.) | MARVIN | SP RR | 0.42 | 4 | UA | 600 | 100% | 686 | 701 | 1387 | 504 | 504 | 1008 | 583 | 425 | 0 |
| 4 | | US 77 (Elm St.) | SP RR | MAIN | 0.13 | 2 | UA | 600 | 100% | 614 | 611 | 1224 | 78 | 78 | 156 | 159 | 0 | 3 |
| 4 | | US 77 (Elm St.) | MAIN | JEFFERSON | 0.10 | 2 | UA | 600 | 100% | 584 | 597 | 1181 | 60 | 60 | 120 | 118 | 2 | 0 |
| 4 | | US 77 (Elm St.) | JEFFERSON | MADISON | 0.05 | 2 | UA | 600 | 100% | 542 | 627 | 1169 | 30 | 30 | 60 | 58 | 3 | 1 |
| 4 | | NORTHGATE | HIGHSCHOOL | US 77 (Dallas Hwy) | 0.40 | 2 | UC | 500 | 100% | 341 | 229 | 571 | 200 | 200 | 400 | 228 | 172 | 0 |
| 4 | | NORTHGATE | US 77 (Dallas Hwy) | SOLON | 0.67 | 2 | UC | 500 | 100% | 309 | 352 | 661 | 335 | 335 | 670 | 443 | 227 | 0 |
| 4 | | HIGH SCHOOL | US 287 | BROWN | 0.49 | 2 | UC | 500 | 100% | 124 | 179 | 303 | 245 | 245 | 490 | 149 | 341 | 0 |
| 4 | | BROWN | US 287 | INDIAN | 0.12 | 4 | UA | 600 | 100% | 537 | 528 | 1065 | 144 | 144 | 288 | 128 | 160 | 0 |
| 4 | | BROWN | INDIAN | KIRKSY | 0.80 | 4 | UA | 600 | 100% | 379 | 353 | 732 | 960 | 960 | 1920 | 585 | 1335 | 0 |
| 4 | | BROWN | KIRKSY | ROSS | 0.40 | 2 | UA | 600 | 100% | 337 | 366 | 703 | 240 | 240 | 480 | 281 | 199 | 0 |
| 4 | | BROWN | ROSS | MARVIN | 0.26 | 2 | UA | 600 | 100% | 228 | 260 | 488 | 156 | 156 | 312 | 127 | 185 | 0 |
| 4 | | JOHN ARDEN | US 77 (Dallas Hwy) | E. UNIVERSITY | 0.49 | 2 | UC | 500 | 100% | 94 | 86 | 180 | 245 | 245 | 490 | 88 | 402 | 0 |
| 4 | | JOHN ARDEN | E. UNIVERSITY | SOLON | 0.48 | 2 | UC | 500 | 100% | 106 | 128 | 235 | 240 | 240 | 480 | 113 | 367 | 0 |
| 4 | | JOHN ARDEN | SOLON | SAM GEORGE | 0.90 | 2 | UC | 500 | 100% | 119 | 139 | 258 | 450 | 450 | 900 | 232 | 668 | 0 |
| 4 | | SOLON | US 287 | JOHN ARDEN | 0.70 | 2 | UA | 600 | 100% | 78 | 76 | 154 | 420 | 420 | 840 | 108 | 732 | 0 |
| 4 | | SOLON | JOHN ARDEN | GRAND | 0.37 | 2 | UA | 600 | 100% | 206 | 211 | 417 | 222 | 222 | 444 | 154 | 290 | 0 |
| 4 | | GRAND | SOLON | MARVIN | 0.50 | 2 | UA | 600 | 100% | 208 | 213 | 421 | 300 | 300 | 600 | 211 | 389 | 0 |
| 4 | | GRAND | MARVIN | MAIN | 0.30 | 2 | UA | 600 | 100% | 197 | 247 | 444 | 180 | 180 | 360 | 133 | 227 | 0 |
| 4 | | E. UNIVERSITY | US 77 (Dallas Hwy) | JOHN ARDEN | 0.33 | 2 | UC | 500 | 100% | 184 | 168 | 353 | 165 | 165 | 330 | 116 | 214 | 0 |
| 4 | | E. UNIVERSITY | JOHN ARDEN | ROSS | 0.39 | 2 | UC | 500 | 100% | 146 | 139 | 285 | 195 | 195 | 390 | 111 | 279 | 0 |
| 4 | | E. UNIVERSITY | ROSS | MARVIN | 0.38 | 2 | UC | 500 | 100% | 105 | 105 | 211 | 190 | 190 | 380 | 80 | 300 | 0 |
| 4 | | FARLEY | US 287 | ROSS | 0.91 | 2 | UC | 500 | 100% | 168 | 158 | 326 | 455 | 455 | 910 | 297 | 613 | 0 |
| 4 | | FARLEY | ROSS | MARVIN | 0.28 | 2 | UC | 500 | 100% | 168 | 100 | 268 | 140 | 140 | 280 | 75 | 205 | 0 |
| 4 | | SYCAMORE | GRAND | E. UNIVERSITY | 0.36 | 2 | UC | 500 | 100% | 136 | 94 | 229 | 180 | 180 | 360 | 83 | 277 | 0 |
| 4 | | SYCAMORE | E. UNIVERSITY | BRYSON | 0.47 | 2 | UC | 500 | 100% | 104 | 136 | 240 | 235 | 235 | 470 | 113 | 357 | 0 |
| 4 | | SYCAMORE | BRYSON | US 77 (Dallas Hwy) | 0.10 | 2 | UC | 500 | 100% | 85 | 180 | 265 | 50 | 50 | 100 | 27 | 73 | 0 |
| 4 | | ROSS | GRAND | E. UNIVERSITY | 0.36 | 2 | UC | 500 | 100% | 11 | 13 | 23 | 180 | 180 | 360 | 8 | 352 | 0 |
| 4 | | ROSS | E. UNIVERSITY | BRYSON | 0.45 | 2 | UC | 500 | 100% | 13 | 15 | 27 | 225 | 225 | 450 | 12 | 438 | 0 |
| 4 | | ROSS | BRYSON | US77 (Ferris Ave.) | 0.10 | 2 | UC | 500 | 100% | 85 | 180 | 265 | 50 | 50 | 100 | 27 | 73 | 0 |
| 4 | | ROSS | US77 (Ferris Ave.) | BROWN | 0.19 | 2 | UC | 500 | 100% | 73 | 53 | 125 | 95 | 95 | 190 | 24 | 166 | 0 |
| 4 | | ROSS | BROWN | FARLEY | 0.39 | 2 | UC | 500 | 100% | 72 | 73 | 144 | 195 | 195 | 390 | 56 | 334 | 0 |
| 4 | | ROSS | FARLEY | WYATT | 0.46 | 2 | UC | 500 | 100% | 53 | 95 | 147 | 230 | 230 | 460 | 68 | 392 | 0 |
| 4 | | MARVIN | GRAND | E. UNIVERSITY | 0.43 | 2 | UC | 500 | 100% | 105 | 105 | 211 | 215 | 215 | 430 | 91 | 339 | 0 |
| 4 | | MARVIN | E. UNIVERSITY | BRYSON | 0.43 | 2 | UC | 500 | 100% | 316 | 278 | 594 | 215 | 215 | 430 | 255 | 175 | 0 |
| 4 | | MARVIN | BRYSON | US77 (Ferris Ave.) | 0.10 | 2 | UC | 500 | 100% | 179 | 268 | 447 | 50 | 50 | 100 | 45 | 55 | 0 |
| 4 | | MARVIN | US77 (Ferris Ave.) | BROWN | 0.18 | 4 | UC | 500 | 100% | 458 | 308 | 766 | 180 | 180 | 360 | 138 | 222 | 0 |
| 4 | | MARVIN | BROWN | FARLEY | 0.40 | 2 | UC | 500 | 100% | 279 | 284 | 563 | 200 | 200 | 400 | 225 | 175 | 0 |
| 4 | | W. MAIN | IH 35 NBFR | GRAND | 1.00 | 2 | UA | 600 | 100% | 403 | 481 | 884 | 600 | 600 | 1200 | 884 | 316 | 0 |
| 4 | | W. MAIN | GRAND | US 77 (Elm) | 1.11 | 2 | UA | 600 | 100% | 206 | 234 | 440 | 666 | 666 | 1332 | 488 | 844 | 0 |
| 4 | | WYATT | E. MAIN | PETERS | 0.55 | 2 | UA | 600 | 100% | 156 | 108 | 264 | 330 | 330 | 660 | 145 | 515 | 0 |
| 4 | 6 | FM 1446 (CANTRELL) | IH 35 NBFR | S. ELM | 0.79 | 2 | UC | 500 | 50% | 0 | 186 | 186 | 0 | 395 | 395 | 147 | 248 | 0 |
| 4 | 6 | US 77 (Elm St.) | FM 1446 (CANTRELL) | MADISON | 0.30 | 2 | UC | 500 | 50% | 0 | 469 | 469 | 0 | 150 | 150 | 141 | 9 | 0 |
| 4 | 6 | US 77 (Elm St.) | MADISON | MAIN | 0.15 | 2 | UC | 500 | 50% | 0 | 469 | 469 | 0 | 75 | 75 | 70 | 5 | 0 |
| 4 | 6 | MAIN | S ELM | KAUFMAN | 0.23 | 2 | UC | 500 | 50% | 0 | 262 | 262 | 0 | 115 | 115 | 60 | 55 | 0 |
| 4 | 6 | MAIN | KAUFMAN | WYATT | 0.21 | 2 | UC | 500 | 50% | 0 | 157 | 157 | 0 | 105 | 105 | 33 | 72 | 0 |
| 4 | 6 | MAIN | WYATT | GETZENDANER | 0.36 | 2 | UC | 500 | 50% | 0 | 154 | 154 | 0 | 180 | 180 | 55 | 125 | 0 |
| 4 | 6 | GETZENDANER | MAIN | PETERS | 0.55 | 2 | UC | 500 | 50% | 0 | 26 | 26 | 0 | 275 | 275 | 14 | 261 | 0 |
| 4 | 6 | PETERS | GETZENDANER | WYATT | 0.09 | 2 | UC | 500 | 50% | 0 | 38 | 38 | 0 | 45 | 45 | 3 | 42 | 0 |
| 4 | 6 | WYATT | PETERS | US 287 SB FR | 0.83 | 2 | UA | 600 | 50% | 0 | 149 | 149 | 0 | 498 | 498 | 124 | 374 | 0 |
| ***Sub-Total*** | | | | | *22.24* | | | | | | | | | | *25,934* | *11,953* | *14,448* | *468* |
| 5 | 2 | BROWN | US 287 | SPRING CREEK | 0.80 | 2 | UA | 600 | 50% | 396 | 0 | 396 | 480 | 0 | 480 | 317 | 163 | 0 |
| 5 | 2 | BROWN | SPRING CREEK | E CITY LIMIT | 0.69 | 2 | UA | 600 | 50% | 316 | 0 | 316 | 414 | 0 | 414 | 218 | 196 | 0 |
| 5 | | BROADHEAD LN | US 287 WBFR | APRIL LN | 1.09 | 2 | UA | 600 | 100% | 272 | 270 | 542 | 654 | 654 | 1308 | 591 | 717 | 0 |
| 5 | | FM 878 | US 287 WBFR | E. CITY LIMIT | 0.40 | 2 | UC | 500 | 100% | 126 | 105 | 232 | 200 | 200 | 400 | 93 | 307 | 0 |
| 5 | | PALMER & BOYCE RD. | US 287 WBFR | E. CITY LIMIT | 0.65 | 2 | UC | 500 | 100% | 101 | 116 | 217 | 325 | 325 | 650 | 141 | 509 | 0 |
| ***Sub-Total*** | | | | | *3.63* | | | | | | | | | | *3,252* | *1,359* | *1,893* | *0* |

## Waxahachie Roadway Impact Fee Study
## Existing Capital Improvements Analysis

| Serv Area | Shared Svc Area | Roadway | From | To | Length (mi) | No. of Lanes | Type | Lane Capacity | Pct. in Serv. Area | Peak Hour Volume A | B | Total | VMT Supply A Dir Pk Dir | VMT Supply B Dir Pk Dir | VMT Supply Pk Hr Total | VMT Demand Pk Hr Total | Total VMT Excess Capacity | Total VMT Deficiency |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 3 | FM 1446 (CANTRELL) | IH 35 SBFR | W. CITY LIMITS | 0.24 | 2 | UA | 600 | 50% | 0 | 124 | 124 | 0 | 144 | 144 | 30 | 114 | 0 |
| 6 | 4 | FM 1446 (CANTRELL) | IH 35 NBFR | S. ELM | 0.79 | 2 | UC | 500 | 50% | 93 | 0 | 93 | 395 | 0 | 395 | 73 | 322 | 0 |
| 6 | 4 | S ELM | FM 1446 (CANTRELL) | MADISON | 0.30 | 2 | UC | 500 | 50% | 469 | 0 | 469 | 150 | 0 | 150 | 141 | 9 | 0 |
| 6 | | S ELM | MADISON | MAIN | 0.15 | 2 | UC | 500 | 50% | 469 | 0 | 469 | 75 | 0 | 75 | 70 | 5 | 0 |
| 6 | 4 | MAIN | S ELM | KAUFMAN | 0.23 | 2 | UC | 500 | 50% | 262 | 0 | 262 | 115 | 0 | 115 | 60 | 55 | 0 |
| 6 | 4 | MAIN | KAUFMAN | WYATT | 0.21 | 2 | UC | 500 | 50% | 159 | 0 | 159 | 105 | 0 | 105 | 33 | 72 | 0 |
| 6 | | MAIN | WYATT | GETZENDANER | 0.36 | 2 | UC | 500 | 100% | 177 | 0 | 177 | 180 | 0 | 180 | 64 | 116 | 0 |
| 6 | 4 | GETZENDANER | MAIN | PETERS | 0.55 | 2 | UC | 500 | 50% | 26 | 0 | 26 | 275 | 0 | 275 | 14 | 261 | 0 |
| 6 | 4 | PETERS | GETZENDANER | WYATT | 0.09 | 2 | UC | 500 | 100% | 0 | 53 | 53 | 0 | 45 | 45 | 5 | 40 | 0 |
| 6 | 4 | WYATT | PETERS | US 287 SB FR | 0.83 | 2 | UA | 600 | 100% | 113 | 0 | 113 | 498 | 0 | 498 | 93 | 405 | 0 |
| 6 | | S RODGERS (FM 66) | W. CITY LIMIT | IH35 SB FR | 1.20 | 2 | UA | 600 | 100% | 259 | 384 | 643 | 720 | 720 | 1440 | 772 | 668 | 0 |
| 6 | | S RODGERS (FM 66) | IH 35 NB FR | HOWARD | 0.74 | 2 | UA | 600 | 100% | 169 | 307 | 477 | 444 | 444 | 888 | 353 | 535 | 0 |
| 6 | | FIVE POINTS | W CITY LIMIT | IH35 SB FR | 0.28 | 2 | UA | 600 | 100% | 391 | 587 | 978 | 168 | 168 | 336 | 274 | 62 | 0 |
| 6 | | FIVE POINTS | IH35 NB FR | RODGERS | 0.45 | 2 | UC | 500 | 100% | 37 | 77 | 114 | 225 | 225 | 450 | 51 | 399 | 0 |
| 6 | | US 77 | RODGERS | HILLTOP | 0.57 | 2 | UA | 600 | 100% | 217 | 293 | 509 | 342 | 342 | 684 | 290 | 394 | 0 |
| 6 | | US 77 | HILLTOP | IH35 NB FR | 0.44 | 2 | UA | 600 | 100% | 238 | 293 | 531 | 264 | 264 | 528 | 233 | 295 | 0 |
| 6 | | PARKS SCHOOL HOUSE | GETZENDANER | US 287 | 1.55 | 2 | UA | 600 | 100% | 38 | 59 | 97 | 930 | 930 | 1860 | 150 | 1710 | 0 |
| 6 | | GRAHAM | PARKS SCHOOL | S. MAIN | 0.33 | 2 | UA | 600 | 100% | 26 | 35 | 61 | 198 | 198 | 396 | 20 | 376 | 0 |
| 6 | | S MAIN | GETZENDANER | GRAHAM | 0.41 | 2 | UA | 600 | 100% | 154 | 177 | 331 | 246 | 246 | 492 | 136 | 356 | 0 |
| 6 | | S MAIN | GRAHAM | US 287 SB FR | 2.01 | 2 | UA | 600 | 100% | 127 | 140 | 267 | 1206 | 1206 | 2412 | 537 | 1875 | 0 |
| 6 | | S MAIN | US 287 SB FR | US 287 | 0.44 | 2 | UA | 600 | 100% | 11 | 95 | 105 | 264 | 264 | 528 | 46 | 482 | 0 |
| 6 | | HOWARD | RODGERS | OLD ITALY | 0.99 | 2 | UA | 600 | 100% | 280 | 180 | 460 | 594 | 594 | 1188 | 455 | 733 | 0 |
| 6 | | HOWARD | OLD ITALY | LAKE SHORE | 2.42 | 2 | UA | 600 | 100% | 210 | 148 | 358 | 1452 | 1452 | 2904 | 867 | 2037 | 0 |
| 6 | | HOWARD | LAKE SHORE | HUNTER PASS | 1.23 | 2 | UC | 500 | 100% | 65 | 120 | 185 | 615 | 615 | 1230 | 228 | 1002 | 0 |
| 6 | | HOWARD | PENN RD | SERVICE AREA | 0.95 | 2 | UC | 500 | 100% | 80 | 35 | 115 | 475 | 475 | 950 | 109 | 841 | 0 |
| 6 | | OLD ITALY | HOWARD | LAKESHORE | 1.75 | 2 | UC | 500 | 100% | 47 | 70 | 117 | 875 | 875 | 1750 | 205 | 1545 | 0 |
| 6 | | LAKESHORE | OLD ITALY | HOWARD | 1.58 | 2 | UC | 500 | 100% | 80 | 90 | 170 | 790 | 790 | 1580 | 269 | 1311 | 0 |
| 6 | | PENN RD | HOWARD | CITY LIMITS | 1.28 | 2 | UC | 500 | 100% | 31 | 41 | 72 | 640 | 640 | 1280 | 92 | 1188 | 0 |
| 6 | | LAKE WOOD | CITY LIMITS | CITY LIMITS | 0.96 | 2 | UC | 500 | 100% | 20 | 34 | 54 U | 480 | 480 | 960 | 52 | 908 | 0 |
| ***Sub-Total*** | | | | | *23.33* | | | | | | | | | | *23,838* | *5,723* | *18,115* | *0* |
| 7 | | PARKS SCHOOL HOUSE | US 287 | CURVE | 1.41 | 2 | UC | 500 | 100% | 16 | 26 | 42 | 705 | 705 | 1410 | 59 | 1351 | 0 |
| 7 | | PARKS SCHOOL HOUSE | CURVE | S. CITY LIMITS | 1.33 | 2 | UC | 500 | 100% | 15 | 15 | 30 | 665 | 665 | 1330 | 40 | 1290 | 0 |
| ***Sub-Total*** | | | | | *2.74* | | | | | | | | | | *2,740* | *99* | *2,641* | *0* |
| ***Total*** | | | | | **77.14** | | | | | | | | | | **91,910** | **37,339** | **55,195** | **624** |

DA- Divided arterial
UA- Undivided arterial
SA- Special arterial with dual-left turn lane
DC- Divided collector
UC- Undivided collector

# D. Calculation of Vehicle-Miles of New Demand

**Vehicle-Mile Trip Generation by Service Area, Waxahachie Impact Fee Study**
Based on May 15, 2008 Land Use Assumtptions by Sefko Planning Group/FNI.

*Estimated Residential Growth Vehicle-Mile Trip Generation*

| Service Area | Added Dwelling Units | Vehicle-Miles per DU | Total Vehicle-Miles |
|---|---|---|---|
| 1 | 789 | 2.73 | 2152 |
| 2 | 266 | 2.73 | 725 |
| 3 | 240 | 2.73 | 654 |
| 4 | 150 | 2.73 | 409 |
| 5 | 861 | 2.73 | 2348 |
| 6 | 1153 | 2.73 | 3144 |
| 7 | 210 | 2.73 | 573 |

| ***SU Equivalency*** | |
|---|---|
| SF Res | 2.73 |
| Basic Employ | 1.69 |
| Service Employ | 4.24 |
| Retail Employ | 2.22 |

*Estimated Basic Employment Growth Vehicle-Mile Generation*

| Service Area | Added Employees | Square Feet per emp. | Total Square Feet | Vehicle-Miles Per 1000/SF | Total Vehicle-Miles |
|---|---|---|---|---|---|
| 1 | 509 | 1205 | 613,345 | 1.69 | 1,036 |
| 2 | 847 | 1205 | 1,020,635 | 1.69 | 1,725 |
| 3 | 30 | 1205 | 36,150 | 1.69 | 61 |
| 4 | 1384 | 1205 | 1,667,720 | 1.69 | 2,818 |
| 5 | 25 | 1205 | 30,125 | 1.69 | 51 |
| 6 | 265 | 1205 | 319,325 | 1.69 | 540 |
| 7 | 0 | 1205 | 0 | 1.69 | 0 |

*Estimated Service Employment Growth Vehicle-Mile Generation*

| Service Area | Added Employees | Square Feet per emp. | Total Square Feet | Vehicle-Miles Per 1000/SF | Total Vehicle-Miles |
|---|---|---|---|---|---|
| 1 | 1275 | 350 | 446,250 | 4.24 | 1,891 |
| 2 | 644 | 350 | 225,400 | 4.24 | 955 |
| 3 | 26 | 350 | 9,100 | 4.24 | 39 |
| 4 | 1722 | 350 | 602,700 | 4.24 | 2,554 |
| 5 | 6 | 350 | 2,100 | 4.24 | 9 |
| 6 | 287 | 350 | 100,450 | 4.24 | 426 |
| 7 | 0 | 350 | 0 | 4.24 | 0 |

*Estimated Retail Employment Growth Vehicle-Mile Generation*

| Service Area | Added Employees | Square Feet per emp. | Total Square Feet | Vehicle-Miles Per 1000/SF | Total Vehicle-Miles |
|---|---|---|---|---|---|
| 1 | 548 | 800 | 438,400 | 2.22 | 974 |
| 2 | 184 | 800 | 147,200 | 2.22 | 327 |
| 3 | 11 | 800 | 8,800 | 2.22 | 20 |
| 4 | 582 | 800 | 465,600 | 2.22 | 1,034 |
| 5 | 9 | 800 | 7,200 | 2.22 | 16 |
| 6 | 76 | 800 | 60,800 | 2.22 | 135 |
| 7 | 3 | 800 | 2,400 | 2.22 | 5 |

***Vehicle-mile Generation Summary***

| Service Area | Residential Growth Vehicle-Miles | Basic Growth Vehicle-Miles | Service Growth Vehicle-Miles | Retail Growth Vehicle-Miles | Total Growth Vehicle-Miles |
|---|---|---|---|---|---|
| 1 | 2152 | 1036 | 1891 | 974 | **6053** |
| 2 | 725 | 1725 | 955 | 327 | **3732** |
| 3 | 654 | 61 | 39 | 20 | **774** |
| 4 | 409 | 2818 | 2554 | 1034 | **6815** |
| 5 | 2348 | 51 | 9 | 16 | **2424** |
| 6 | 3144 | 540 | 426 | 135 | **4245** |
| 7 | 573 | 0 | 0 | 5 | **578** |
| Totals | 10,005 | 6,231 | 5,873 | 2,510 | **24,620** |

# E. Roadway Impact Fee
# Capital Improvement Plan Memorandum

# F. Roadway Improvement Plan Projects

**ROADWAY IMPROVEMENTS PLAN PROJECTS**

**Definitions**

| | |
|---|---|
| LANES | The total number of lanes in both directions available for travel. |
| TYPE | The type of roadway (used in determining capacity):<br><br>DA = divided arterial |
| PK-HR VOLUME | the existing volumes of cars on the roadway segment traveling during the afternoon (P.M.) peak hour of travel. |
| % IN SERVICE AREA | If the roadway is located on the boundary of the service area (with the city limits running along the centerline of the roadway), then half of the roadway is inventoried in the service area and the other half is not. This value is either 50% or 100%. |
| VEH-MI SUPPLY TOTAL | The number of total service units (vehicle-miles) supplied within the service area, based on the length and established capacity of the roadway type. |
| VEH-MI TOTAL DEMAND PK-HR | The total service unit (vehicle-mile) demand created by existing traffic on the roadway segment in the afternoon peak hour. |
| EXCESS CAPACITY PK-HR VEH-MI | The number of service units supplied but unused by existing traffic in the afternoon peak hour. |

**2008 Waxahachie Roadway Impact Fee Study**
**Roadway Capital Improvements Plan**

| Serv Area | Reference CIP No. | Roadway | From | To | Project Status | Length (mi) | No. of Lanes | Type | T'fare Plan Type | Comment | Pct. in Serv. Area | Peak Hour Volume A | B | Total | VMT Supply Pk Hr Total | VMT Demand Pk Hr Total | Excess VMT Capacity | CIP VMT Deficiency |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Longbranch Rd | US 287 | Longbranch Rd | New | 1.18 | 4 | DA | A-2 | | 100% | 64 | 52 | 116 | 2944 | 137 | 2808 | 0 |
| 1 | 2 | Ovilla Rd*** | US 287 | New Road A (S. of Oregon ) | New | 0.42 | 4 | DA | A-2 | TXDOT Part. | 100% | 218 | 198 | 416 | 1056 | 176 | 880 | 0 |
| 1 | 3 | New Road A | Ovilla Rd. | Loftland | New | 1.30 | 4 | DA | B | | 100% | 0 | 0 | 0 | 3262 | 0 | 3262 | 0 |
| 1 | 4 | Lofland | Solon | IH 35 | New | 0.35 | 4 | UA | B | | 100% | 0 | 0 | 0 | 845 | 0 | 845 | 0 |
| ***Sub-total SA 1*** | | | | | | **3.26** | | | | | | | | **532** | **8107** | **312** | **7795** | **0** |
| 2 | 5 | Lofland\Cardinal | IH-35 | US 77 | New | 0.60 | 4 | DA | B | | 100% | 0 | 0 | 0 | 1498 | 0 | 1498 | 0 |
| 2 | 6 | Grove Creek Ext | US 77 | New Road B (W. of Brookstone) | New | 0.69 | 4 | DA | B | | 100% | 0 | 0 | 0 | 1717 | 0 | 1717 | 0 |
| 2 | 7 | New Road B | Grove Creek Ext | Brown Rd (FM 813) | New | 1.20 | 4 | DA | C | | 100% | 0 | 0 | 0 | 3010 | 0 | 3010 | 0 |
| 2/5 | 8 | Brown Rd FM 813 | Brown Rd (FM 813) | Brown Rd (FM 813) | New | 0.68 | 4 | DA | C | TXDOT Part. | 50% | 0 | 246 | 246 | 850 | 167 | 683 | 0 |
| ***Sub-total SA 2*** | | | | | | **3.17** | | | | | | | | **246** | **7075** | **167** | **6908** | **0** |
| 3 | 9 | Ovilla Rd*** | US 287 | Mid-Project | New | 0.47 | 4 | DA | B | TXDOT Part. | 100% | 72 | 82 | 154 | 1180 | 73 | 1107 | 0 |
| 3 | 10 | Ovilla Rd*** | Mid-Project | Bus 287 | New | 0.80 | 4 | DA | B | TXDOT Part. | 100% | 0 | 0 | 0 | 2007 | 0 | 2007 | 0 |
| ***Sub-total SA 3*** | | | | | | **1.27** | | | | | | | | **154** | **3187** | **73** | **3114** | **0** |
| 4 | 11 | John Arden | US 287 | Solon | New | 0.96 | 4 | DA | C | | 100% | 132 | 113 | 245 | 2412 | 236 | 2175 | 0 |
| 4 | 12 | Northgate | Existing | Stadium Dr. | Recoup. | 0.11 | 2 | UC | D | | 100% | 420 | 339 | 759 | 110 | 84 | 27 | 0 |
| 4 | 13 | Stadium Dr. | Stadium Dr. | US 287 | Recoup. | 0.26 | 2 | UC | D | | 100% | 190 | 176 | 366 | 256 | 94 | 162 | 0 |
| 4 | 14 | River Oaks | Brown | River Oaks | New | 0.71 | 2 | UC | D | | 100% | 0 | 0 | 0 | 708 | 0 | 708 | 0 |
| 4 | 15 | River Oaks/Marvin Connection | Farley | Marvin Ave. | New | 0.60 | 2 | UC | D | | 100% | 0 | 0 | 0 | 599 | 0 | 599 | 0 |
| ***Sub-total SA 4*** | | | | | | **3.24** | | | | | | | | **1370** | **4085** | **413** | **3671** | **0** |
| 5/2 | 8 | Brown Rd (FM 813) *** | Brown Rd (FM 813) | Brown Rd (FM 813) | New | 0.68 | 4 | DA | C | TXDOT Part. | 50% | 376 | 0 | 376 | 1700 | 256 | 1444 | 0 |
| 5 | 16 | Broadhead | US 287 | April Lane | Recoup. | 1.02 | 4 | DA | C | | 100% | 272 | 270 | 542 | 2562 | 555 | 2006 | 0 |
| ***Sub-total SA 5*** | | | | | | **1.70** | | | | | | | | **918** | **4262** | **811** | **3451** | **0** |
| 6 | 17 | New Road C - Segment 1 | US 77 | Howard | New | 0.71 | 4 | DA | C | | 100% | 0 | 0 | 0 | 1773 | 0 | 1773 | 0 |
| 6 | 18 | New Road C - Segment 2 | Howard | Bus 287 | New | 1.29 | 4 | DA | C | | 100% | 0 | 0 | 0 | 3231 | 0 | 3231 | 0 |
| 6 | 19 | New Road C - Segment 3 *** | Bus 287 | US 287 | New | 0.93 | 4 | DA | C | TXDOT Part. | 100% | 0 | 0 | 0 | 2321 | 0 | 2321 | 0 |
| ***Sub-total SA 6*** | | | | | | **2.93** | | | | | | | | **0** | **7325** | **0** | **7325** | **0** |
| 7 | 20 | New Road D | US 287 | Park School House | New | 0.52 | 4 | DA | A | | 100% | 0 | 0 | 0 | 1288 | 0 | 1288 | 0 |
| ***Sub-total SA 6*** | | | | | | **0.52** | | | | | | | | **0** | **1288** | **0** | **1288** | **0** |
| | | | | | | **15.41** | | | | | | | | **3,220** | **35,328** | **1,777** | **33,551** | **0** |

**Notes:**

DA- Divided arterial
DC- Divided collector
UC- Undivided collector

R - Recoupment project
N - New Project
*** Anticipated TXDOT Participation

File: Waxhachie Impact Fee\Dbase\dbase7.xls

# G. Roadway Improvements Plan Cost Analysis

**ROADWAY IMPROVEMENTS PLAN COST ANALYSIS**

## Definitions

| | |
|---|---|
| LANES | The total number of lanes in both directions available for travel. |
| TYPE | The type of roadway (used in determining capacity):<br><br>DA = divided arterial |
| % IN SERVICE AREA | If the roadway is located on the boundary of the service area (with the city limits running along the centerline of the roadway), then half of the roadway is inventoried in the service area and the other half is not. This value is either 50% or 100%. |
| TOTAL SEGMENT COST | The estimated cost (in dollars) of the entire segment of the proposed improvement. |
| TOTAL COST IN SERVICE AREA | The estimated cost (in dollars) of the portion of the proposed roadway improvement within the service area. |

**2008 Waxahachie Roadway Impact Fee Study**
**Roadway Capital Improvements Plan**

| Serv Area | Reference CIP No. | Roadway | From | To | Length (mi) | No. of Lanes | Type | Pct. in Serv. Area | Actual Project Cost | *Project Cost 50% Credit* | *Study Update Cost* | *Service Area Total Cost* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | *1* | Longbranch Rd | US 287 | Longbranch Rd | 1.18 | 4 | DA | 100% | $7,773,116 | $3,883,641 | $5,834 | $3,889,475 |
| 1 | *2* | Ovilla Rd*** | US 287 | New Road A (S. of Oregon ) | 0.42 | 4 | DA | 100% | $1,448,550 | $723,229 | $2,093 | $725,321 |
| 1 | *3* | New Road A | Ovilla Rd. | Loftland | 1.30 | 4 | DA | 100% | $7,690,073 | $3,841,805 | $6,464 | $3,848,269 |
| 1 | *4* | Lofland | Solon | IH 35 | 0.35 | 4 | UA | 100% | $2,045,597 | $1,021,962 | $1,673 | $1,023,635 |
| ***Sub-total SA 1*** | | | | | **3.26** | | | | **$18,957,336** | **$9,470,636** | **$16,063** | **$9,486,700** |
| 2 | *5* | Lofland\Cardinal | IH-35 | US 77 | 0.60 | 4 | DA | 100% | $15,541,822 | $7,769,427 | $2,967 | $7,772,394 |
| 2 | *6* | Grove Creek Ext | US 77 | New Road B (W. of Brookstone) | 0.69 | 4 | DA | 100% | $4,100,069 | $2,048,333 | $3,402 | $2,051,735 |
| 2 | *7* | New Road B | Grove Creek Ext | Brown Rd (FM 813) | 1.20 | 4 | DA | 100% | $5,732,745 | $2,863,390 | $5,965 | $2,869,355 |
| 2/5 | *8* | Brown Rd FM 813 | Brown Rd (FM 813) | Brown Rd (FM 813) | 0.68 | 4 | DA | 50% | $794,958 | $396,637 | $1,684 | $398,321 |
| ***Sub-total SA 2*** | | | | | **3.17** | | | | **$26,169,593** | **$13,077,787** | **$14,018** | **$13,091,806** |
| 3 | *9* | Ovilla Rd*** | US 287 | Mid-Project | 0.47 | 4 | DA | 100% | $1,466,981 | $732,321 | $2,338 | $734,660 |
| 3 | *10* | Ovilla Rd*** | Mid-Project | Bus 287 | 0.80 | 4 | DA | 100% | $2,326,720 | $1,161,372 | $3,976 | $1,165,348 |
| ***Sub-total SA 3*** | | | | | **1.27** | | | | **$3,793,701** | **$1,893,693** | **$6,315** | **$1,900,008** |
| 4 | *11* | John Arden | US 287 | Solon | 0.96 | 4 | DA | 100% | $4,930,233 | $2,462,727 | $4,778 | $2,467,505 |
| 4 | *12* | Northgate | Existing | Stadium Dr. | 0.11 | 2 | UC | 100% | $233,407 | $116,594 | $218 | $116,812 |
| 4 | *13* | Stadium Dr. | Stadium Dr. | US 287 | 0.26 | 2 | UC | 100% | $517,233 | $258,363 | $507 | $258,870 |
| 4 | *14* | River Oaks | Brown | River Oaks | 0.71 | 2 | UC | 100% | $3,363,767 | $1,681,182 | $1,403 | $1,682,585 |
| 4 | *15* | River Oaks/Marvin Connection | Farley | Marvin Ave. | 0.60 | 2 | UC | 100% | $3,139,212 | $1,569,012 | $1,188 | $1,570,200 |
| ***Sub-total SA 4*** | | | | | **3.24** | | | | **$12,183,851** | **$6,087,879** | **$8,093** | **$6,095,972** |
| 5/2 | *8* | Brown Rd (FM 813) *** | Brown Rd (FM 813) | Brown Rd (FM 813) | 0.68 | 4 | DA | 50% | $794,958 | $395,795 | $3,368 | $399,163 |
| 5 | *16* | Broadhead | US 287 | April Lane | 1.02 | 4 | DA | 100% | $6,588,743 | $3,291,833 | $5,076 | $3,296,910 |
| ***Sub-total SA 5*** | | | | | **1.70** | | | | **$7,383,701** | **$3,687,628** | **$8,445** | **$3,696,073** |
| 6 | *17* | New Road C - Segment 1 | US 77 | Howard | 0.71 | 4 | DA | 100% | $3,456,885 | $1,726,686 | $3,514 | $1,730,199 |
| 6 | *18* | New Road C - Segment 2 | Howard | Bus 287 | 1.29 | 4 | DA | 100% | $23,537,520 | $11,765,559 | $6,402 | $11,771,961 |
| 6 | *19* | New Road C - Segment 3 *** | Bus 287 | US 287 | 0.93 | 4 | DA | 100% | $11,488,760 | $5,742,081 | $4,598 | $5,746,679 |
| ***Sub-total SA 6*** | | | | | **2.93** | | | | **$38,483,165** | **$19,234,325** | **$14,514** | **$19,248,839** |
| 7 | *20* | New Road D | US 287 | Park School House | 0.52 | 4 | DA | 100% | $3,450,029 | $1,723,738 | $2,552 | $1,726,290 |
| ***Sub-total SA 6*** | | | | | **0.52** | | | | **$3,450,029** | **$1,723,738** | **$2,552** | **$1,726,290** |
| **Totals:** | | | | | **15.41** | | | | **110,421,376** | **55,175,688** | **$70,000** | **55,245,688** |

**Notes:**

DA- Divided arterial
DC- Divided collector
UC- Undivided collector

R - Recoupment project
N - New Project
*** Anticipated TXDOT Participation

File: Waxhachie Impact Fee\Dbase\dbase7.xls

# H. Service Area Analysis Summary

Appendix H

**Waxahachie Roadway Impact Fee Study**

**Service Area Analysis Summary**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Service Area** | **Capacity Supplied by CIP (veh-mi)** | **Existing Utilization (veh-mi)** | **Existing Deficiencies (veh-mi)** | **Net Capacity Supplied by CIP (veh-mi)** | **Total Project Cost of CIP** | **Project Cost of CIP with 50% Credit** | **Cost of Net Capacity Supplied** | **Cost to Meet Existing Utilization** | **Projected 10yr Demand (veh-miles)** | **Pcnt. of CIP Attributable to New Dev. (10-yr)** | **Cost Attributable to New Dev.** | **Cost per Service Unit w/ 50% Credit** | ***Actual Cost per Service Unit (veh-mi)*** |
| **1** | 8,107 | 312 | 0 | 7,795 | $18,973,399 | $9,486,700 | $9,121,155 | $365,545 | 6,053 | 77.7 | $7,082,659.33 | $1,170.00 | *$2,340.00* |
| **2** | 7,075 | 167 | 30 | 6,878 | $26,183,611 | $13,091,806 | $12,727,254 | $364,552 | 3,732 | 54.3 | $6,906,064.21 | $1,850.00 | *$3,700.00* |
| **3** | 3,187 | 73 | 126 | 2,988 | $3,800,016 | $1,900,008 | $1,781,358 | $118,650 | 774 | 25.9 | $461,246.37 | $596.00 | *$1,192.00* |
| **4** | 4,085 | 413 | 468 | 3,203 | $12,191,945 | $6,095,972 | $4,780,861 | $1,315,111 | 6,815 | 100.0 | $4,780,861.01 | $701.00 | *$1,402.00* |
| **5** | 4,262 | 811 | 0 | 3,451 | $7,392,146 | $3,696,073 | $2,992,651 | $703,422 | 2,424 | 70.2 | $2,101,960.20 | $867.00 | *$1,734.00* |
| **6** | 7,325 | 0 | 0 | 7,325 | $38,497,679 | $19,248,839 | $19,248,685 | $154 | 4,245 | 57.9 | $11,153,800.83 | $2,627.00 | *$5,254.00* |
| **7** | 1,288 | 0 | 0 | 1,288 | $3,452,580 | $1,726,290 | $1,726,276 | $14 | 578 | 44.9 | $774,733.15 | $1,340.00 | *$2,680.00* |
| **Totals** | 35,328 | 1,777 | 624 | 32,928 | 110,491,376 | 55,245,688 | $51,491,407 | $3,754,281 | 24,620 | 74.8 | $38,499,757.03 | $1,563.00 | *$3,126.00* |

1. TOTAL VEH-MI OF CAPACITY SUPPLIED BY CIP (TVMCAP)
2. TOTAL VEH-MI OF EXISTING DEMAND (VMEXT)
3. TOTAL VEH-MI OF EXISTING DEFICENCIES (VMDEF)
4. NET AMOUNT OF ROADWAY CAPACITY SUPPLIED (NVMCAP) =
   NVMCAP =TVMCAP-VMEXT-VMDEF
5. TOTAL COST OF CIP WITHIN STUDY AREA
6. TOTAL COST OF CIP IN SERVICE AREA w/50% CREDIT (TVMCOST)
7. COST OF NET CAPACITY SUPPLIED (NCVMCAP) =
   NCVMCAP = (NVMCAP/TVMCAP)*TVMCOST
8. COST TO MEET EXISTING NEEDS AND USAGE (EXCOST) =
   EXCOST = TVMCOST-NCVMCAP
9. TOTAL VEH-MI OF NEW DEMAND OVER TEN YEARS (TNEWDEM)
10. PERCENT OF CIP ATTRIBUTABLE TO NEW DEVELOPMENT (NPCNT) =
    IF TNEWDEM > NVMCAP, NPCNT = 100%
    IF TNEWDEM < NVMCAP, NPCNT = (TNEWDEM / NVMCAP)*100
11. COST OF CIP ATTRIBUTABLE TO NEW DEVELOPMENT (NCVMDEM) =
    NCVMDEM = (TNEWDEM / NVMCAP) * NCVMCAP
12. COST PER SERVICE UNIT = (MAX FEE)
    MAX FEE = NCVMDEM / TNEWDEM
13. ACTUAL COST PER SERVICE UNIT