

CITY OF LAGO VISTA, TEXAS
RESOLUTION NO. 21-1899

A RESOLUTION BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS ADOPTING LAND USE ASSUMPTIONS AND CAPITAL IMPROVMENTS PLAN FOR THE POTENTIAL IMPOSITION OF IMPACT FEES FOR ROADWAYS.

WHEREAS, Chapter 395 of the Texas Local Government Code provides procedures for preparing land use assumptions and a capital improvements plan for the consideration of imposing roadway impact fees within the municipal limits of a city; and

WHEREAS, the Impact Fee Advisory Committee has reviewed the land use assumptions and capital improvement plan for the service areas designated as shown in attached Exhibit "A"; and

WHEREAS, the Impact Fee Advisory Committee has recommended that the City Council of the City of Lago Vista adopt the land use assumptions and capital improvement plan for the designated service areas in their meeting on June 24, 2021; and

WHEREAS, the City Council of Lago Vista conducted a Public Hearing to receive comment from citizens and other interested parties concerning the adoption of the land use assumptions and capital improvement plan.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS:

Section 1. The City Council hereby adopts the land use assumptions and capital improvement plan as shown in the attached Exhibit "A".

AND, IT IS SO RESOLVED.

PASSED AND APPROVED this 16th day of September 2021.




Ed Tidwell, Mayor

ATTEST:


Sandra Barton

Sandra Barton, City Secretary

On a motion by Councilmember Sullivan, seconded by Councilmember Williams, the above and foregoing instrument was passed and approved.



Innovative approaches
Practical results
Outstanding service



ROADWAY IMPACT FEE PROGRAM LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN

Exhibit "A"

Prepared for:

**City of Lago Vista
September 2021**

Prepared by:

**FREESE AND NICHOLS, INC.
10431 Morado Circle, Ste. 300
Austin TX 78759**



Innovative approaches
Practical results
Outstanding service

ROADWAY IMPACT FEE PROGRAM LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLAN

Prepared for:

City of Lago Vista



FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

Prepared by:

FREESE AND NICHOLS, INC.
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EXECUTIVE SUMMARY

The City of Lago Vista, Texas, authorized Freese and Nichols, Inc. (FNI) to update the water and wastewater impact fees and to develop a new program for roadway impact fees within the city. The purpose of this report is to summarize the methodology used in the development of land use assumptions that will be used for roadway impact fees, as well as to document the development of the capital improvements plan to be used for the potential imposition of impact fees for roads within the city. Statutorily, implementation of a roadway impact fee requires a two-step public hearing process, with the first addressing land use assumptions and road capital improvement plans and the second, for consideration of imposing an impact fee. As an update, the water and wastewater program require only one hearing for land use assumptions, capital improvement plans, and updated impact fee calculations.

LAND USE ASSUMPTIONS

Population and land use assumptions are an important requirement in the development of impact fee programs. A reasonable estimation of future growth is required to assist in determining the need and timing of capital improvements to serve future development. Growth and future development projections were formulated based on assumptions from historic growth of the city as well as, the City Future Land Use Plan from the Lago Vista 2030 Comprehensive Plan which identifies type, location, density, and intensity of various future land uses within the community. These land use assumptions, which include population and employment projections for the planning period 2021-2031, form the basis for capital improvements planning for road facilities.

CAPITAL IMPROVEMENT PLAN

A roadway impact fee capital improvements plan (CIP) was developed for Lago Vista based on the land use assumptions, input from City staff, and information contained in the officially approved Thoroughfare Plan. The recommended improvements will provide capacity to address projected roadway demand over the 10-year planning period. The projects identified are consistent with requirements of Chapter 395 of the Texas Local Government Code (TLGC) definition of impact fee eligible projects. The roadway impact fee CIP projects are summarized in **Tables ES-1**.

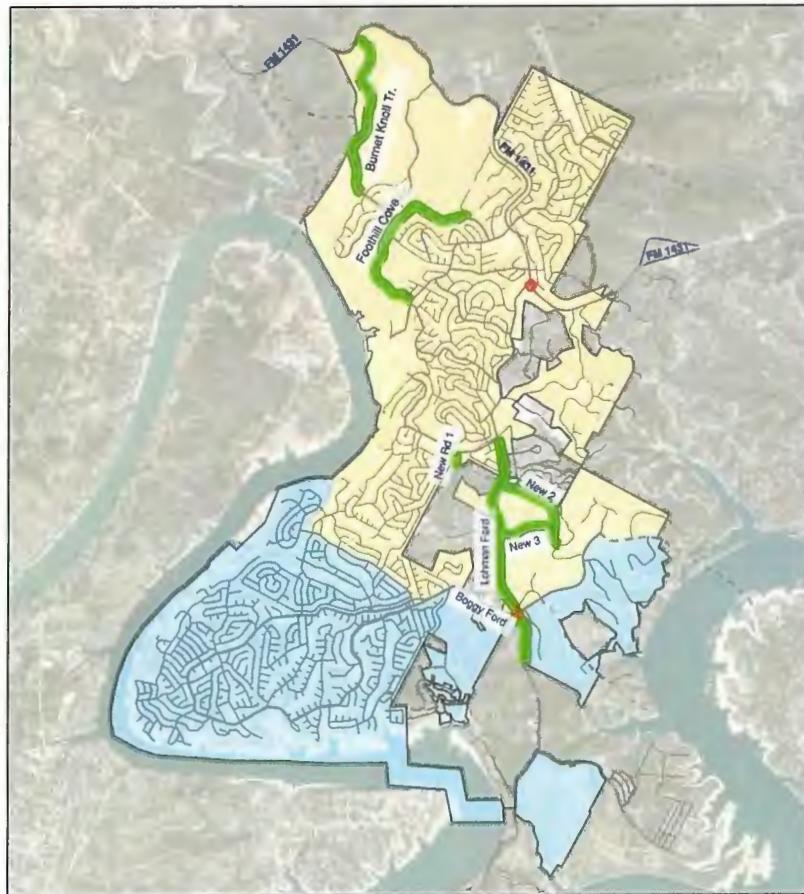


Table ES-1: Roadway Impact Fee CIP Projects

Proj No.	Serv Area	Roadway	From	To	Length (mi)	Thoroughfare Section	Type	Roadway Improvement
1	1	Lohman Ford	Dawn	Shoreline Ranch	1.59	Minor Arterial	DA	Add 2 lanes to existing
2	1	New Road 1	Dawn	Bonanza Ext	0.10	Minor Collector	UC	Construct 2 new lanes
3	1	New Rd 2 (Bonanza Ext.)	Lohman Ford	Gary Player Dr	0.90	Minor Collector	UC	Construct 2 new lanes
4	1	New Road 3	Lohman Ford	New Rd 2 (Bonanza Ext.)	0.48	Minor Collector	UC	Construct 2 new lanes
5	1	Foothill Cove	Existing Roadway	Bar K Ranck (Paseo de Vaca)	1.42	Minor Collector	UC	Construct 2 new lanes
6	1	Barnet Knoll Trail	Existing Roadway	FM1431	1.23	Minor Collector	UC	Construct 2 new lanes
7	1	Lohman Ford / FM 1431 Intersection Improvements			0.01	Principal Arterial	SA	Intersect Imprvs.
Sub-Total Service Area 1					5.73			
8	2	Lohman Ford	Boggy Ford	S. City Limit	0.57	Major Collector	TWLT	Construct Center Turn Lane
Sub-Total Service Area 2					0.57			

Notes*:

- DA - Divided Arterial
- UA - Undivided Arterial
- DC - Divided collector
- UC - Undivided Collector





1.0 INTRODUCTION

Chapter 395 of the Texas Local Government Code prescribes the process by which cities in Texas must formulate impact fees. An initial step in the impact fee development process is the establishment of land use assumptions that address growth and development for a ten-year planning period (TLGC Section 395.001(5)) for the years 2021-2031. These land use assumptions (LUA), which also include population and employment projections, will become the basis for the preparation of impact fee capital improvement plans. Legislative mandate requires that a capital improvements plan (CIP) be prepared that addresses long-term growth and that such plan be approved by the governing body prior to a public hearing for the consideration of imposing an impact fee. The purpose of this report is to detail the development of the land use assumptions and the impact fee capital improvements plan for roads.

To assist the City of Lago Vista in determining the need and timing of capital improvements to serve future development, a reasonable estimation of future growth is required. One purpose of this report is to summarize the growth and development projections based upon assumptions pertaining to the type, location, quantity, and timing of various future land uses within the community, and to establish and document the methodology used for preparing the growth and land use assumptions. These assumptions are also rooted from documentation identified as part of the *Lago Vista 2030 Comprehensive Plan* adopted in April 2017.

Additionally, this report describes the roadway improvements that will be considered in the impact fee program. The roadway capital improvements plan is rooted in the recently adopted Thoroughfare Plan (August 5, 2021) for Lago Vista. In fact, the land use assumptions contained herein were also used in part for the development of the ultimate roadway network for the city. The Thoroughfare Plan looks to 20-year growth, whereas the roadway impact fee program addresses the needs attributable to 10-year growth. Statutorily, roadway impact fees may consider arterial and collector status facilities on the City's Thoroughfare Plan. The roadway impact fee capital improvements plan meets these requirements and further, will only consider capacity necessitated by 10-year growth for the years 2021-2031.



1.1 REPORT ELEMENTS

This report contains the following components:

- **Methodology** – Explanation of the general methodology used to prepare the land use assumptions and capital improvements plan.
- **Land Use Assumptions**
 - **Service Area** – Explanation of data collection zones (traffic analysis zones), and the division of the city into impact fee service areas for roadway.
 - **Base Year Data** – Information on historic population trends in Lago Vista as well as population and employment demographics for 2021 in each capital service area.
 - **Ten-Year Growth Assumptions** – Population and employment growth assumptions for ten years by impact fee service area.
 - **Summary** – Brief synopsis of the land use assumptions report.
- **Capital Improvements Plan**
 - **Existing Conditions Analysis** – Analysis of the existing roadway system; their carrying capacity, current utilization, and deficiencies.
 - **Growth Projections** – Development of growth projections to occur over the ten-year planning period by service area.
 - **Capital Improvements Plan** – Description of the capital improvements plan.



2.0 METHODOLOGY

The data in this report has been formulated using reasonable and generally accepted planning principles for the preparation of impact fee systems in Texas and meets the requirements of the TLGC Chapter 395 for the establishment of impact fees. For the formulation of the land use assumptions and capital improvements plan, a series of work tasks were undertaken and are described below.

1. A kick-off meeting was held to describe the general methodological approach in the study.
2. A Roadway service area structure was developed to address current Lago Vista city limits as well as considerations to allow for potential future city annexations (within city ETJ) into the zonal structure while complying with legislatively mandated limits of six miles.
3. Current and projected data of population and employment was gathered from the 2009 and 2030 Comprehensive Plans, Capital Area Metropolitan Organization (CAMPO) forecasts, U.S. Census data, water meter connections, and input from City staff on upcoming developments to serve as a basis for future growth.
4. An existing conditions inventory was conducted to document system utilization, capacity, and deficiencies based on existing users. To support the existing conditions inventory, traffic volume count data was gathered using StreetLight cell phone data to obtain traffic counts. Through Streetlight, historic traffic counts were obtained from February 2020, prior to effects of COVID-19 pandemic. Vehicle-miles of travel (VMT) in the PM peak hour was identified as the service unit of measure for roadway analyses and impact fee calculations.
5. A base year (2021) estimate of population and employment was prepared using concurred growth projections and residential building permit data.
6. A ten-year projection (2031) of population and employment was prepared using forecasted annual growth rates and input from City staff on upcoming developments known or anticipated development activity within the 10-year planning period.
7. Base and 10-year demographics were prepared for the roadway service areas.
8. A capital improvements plan was identified to address projected growth was developed by service area based upon discussions with City Staff.

This methodology fairly allocates improvement costs to growth areas in relationship to their impact upon the infrastructure system. Based on the growth assumptions and the capital improvements needed to support growth, a logically distributed impact fee structure can subsequently be developed.



3.0 LAND USE ASSUMPTIONS

3.1 DATA COLLECTION ZONES

Data collection zones used for the land use assumptions are based upon small geographic areas known as traffic analysis zones (TAZs). These zones, established by the CAMPO travel demand modeling process, cover the regional planning area, and serve as the basis for socio-demographic data used in the regional travel forecast model. Traffic analysis zones were originally formulated based on homogeneity and traffic generation potential using major arterials, creeks, railroad lines, and other physical boundaries for delineation.

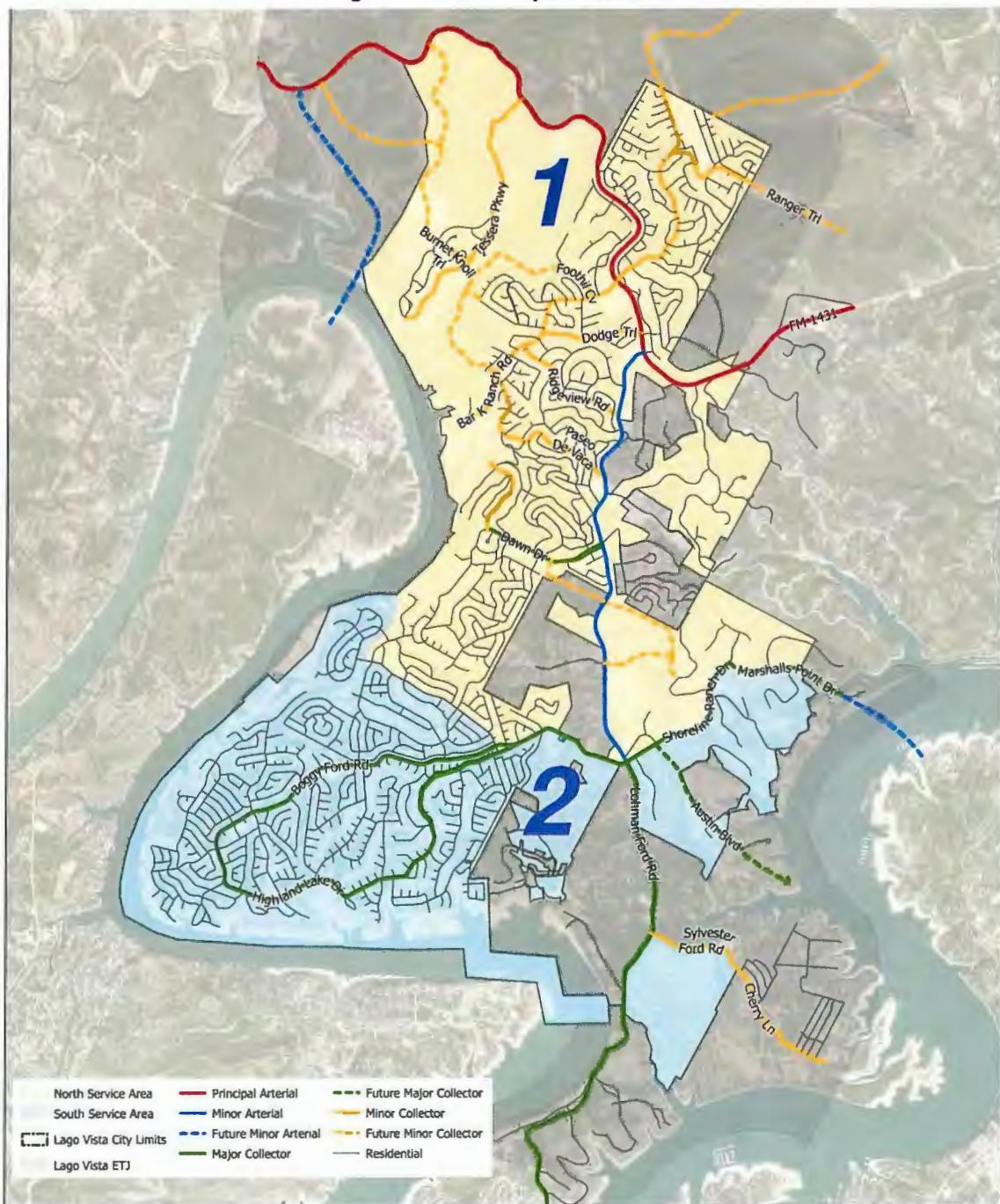
Population and employment demographics will be compiled by TAZ and then aggregated into larger areas to form the service areas for impact fees.

3.2 SERVICE AREAS

Chapter 395 requires that service areas be defined for impact fees to ensure that facility improvements are near areas generating needs. Legislative requirements stipulate that roadway service areas be limited to a six-mile maximum and must be located within the current city limits. The result is that, for roadways, new development can only be assessed an impact fee based on the cost of necessary capital improvements within that service area and within city limits. A roadway service area structure consisting of two (2) areas has been developed for Lago Vista, as depicted in **Figure 3-1**. The service areas were split along Shoreline Ranch Drive, Boggy Ford Road, National Drive, and the Lago Vista Golf Course (Hole #1 and practice range) to the Colorado River in between Outpost Trace and Lakefront Drive. This zonal structure also aligns with the CAMPO TAZ structure and will serve to facilitate program updates. The roadway zonal structure was reviewed and approved by City Staff.



Figure 3-1: Roadway Service Areas





3.3 DATA FORMAT

The existing roadway database, as well as the future projections, was formulated according to the following format and categories:

Service Area	Correlates to the roadway service areas identified on the attached map.
Traffic Survey Zone	Geographic areas established by the MPO Traffic Model which are used for data collection purposes and termed TAZs within this report.
Population (2021)	Existing estimated population for the base year (2021).
Population (2031)	Projected population by service zone for the year 2031 (ten-year growth projection).

Employment (2021-31) Employment data was aggregated into three employment sectors and include Retail, Office, and Industrial land uses. The following details which land use falls within each of the three sectors.

Basic (Industrial) -- Land use activities that produce goods and services such as those that are exported outside the local economy including manufacturing, construction, transportation, wholesale trade, warehousing, and other industrial uses.

Service (Office) -- Land use activities which provide personal and professional services such as financial, insurance, government, and other professional and administrative offices.

Retail -- Land use activities which provide for the retail sale of goods that primarily serve households and whose location choice is oriented toward the household sector such as grocery stores, restaurants, etc.



3.4 BASE YEAR DATA

This section documents the City's historical growth trends and data used to derive the 2021 base year population estimate for the City of Lago Vista. This base data provides a starting basis of data for the 10-year growth assumptions that will be presented within the following section.

3.4.1 Historical Growth

A City's past growth rates are often an indicator of future growth rates. Historical population along with building permit data were used to estimate current population as well as serve as a basis for determining future growth projections. The average annual growth for the historic period is shown in **Table 3-1**.

Table 3-1: Historical City Population

Year	Population	Annual Growth
2010	6,108	-
2011	6,278	2.78%
2012	6,438	2.55%
2013	6,453	0.23%
2014	6,484	0.48%
2015	6,567	1.28%
2016	6,663	1.46%
2017	6,825	2.43%
2018	7,177	5.16%
2019	7,556	5.28%
2020*	8,231	8.94%
2021*	9,100	10.55%

Source: U.S. Census

*Estimated based on 2019 U.S. Census population and household occupancy plus city certified residential housing permits.

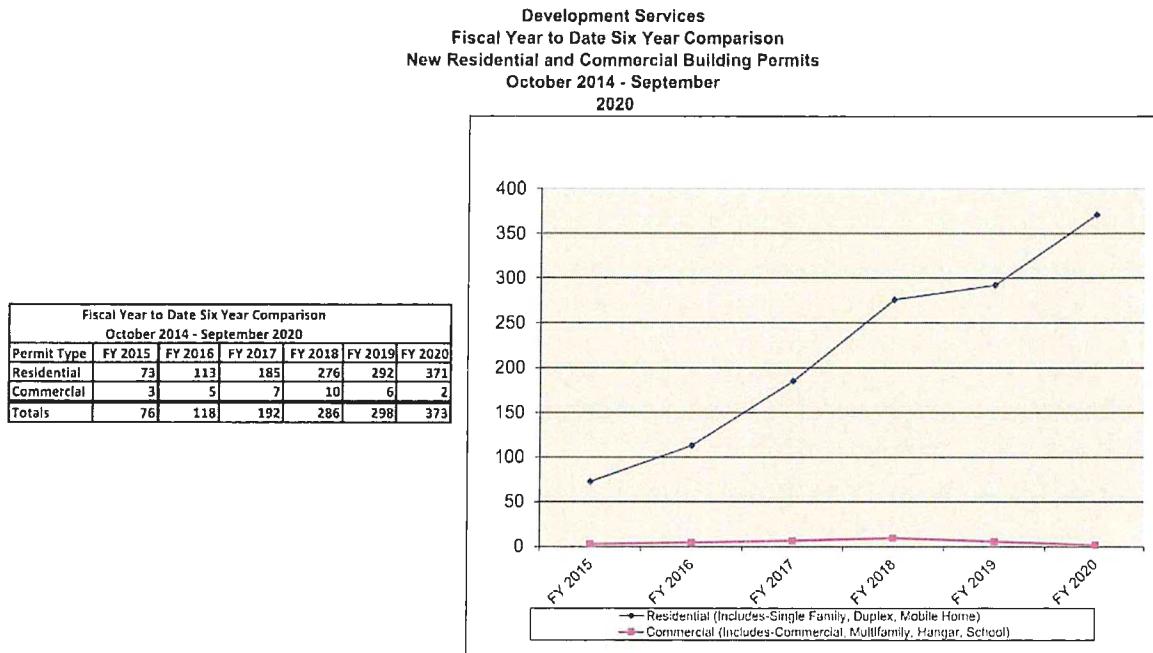
Household Occupancy:	2.53
Occupancy Rate:	99.2%

Since 2017, a marked increase in annual growth has been occurring in Lago Vista. Residential permit data obtained from the city spanning October 2014 through September 2020 were used to evaluate recent residential growth trends. Approximately 1,310 residential units have been added since October 2014 and represents a 5-year average of 40%. Commercial permits increased by 33 since 2014 and represent a 5-



year average of 39%. With 371 residential permits in 2021, the 2021 estimated population is 9,100 persons. Table 3-2 illustrates the increase in building permits since late 2014.

Table 3-2: Building Permit Population Growth



Building permit data and known development activity suggests continued robust growth for a few years followed by a slight leveling over the 10-year planning period. In consultation with City Staff, an 5% annual growth rate was assumed for future years 1-2, followed by a 3% annual growth rate from years 3-10 for use in this study. By law, these land use assumptions must be reviewed at least every five years. At that point, based on development activity/trend, adjustments can be made.

3.4.2 2021 Population and Employment

For the land use assumptions development process, 2021 base population and employment data was calculated using data from Lago Vista, and CAMPO. Data for the city was rooted in a 2009 study for roadways, which divided the city into multiple zones for approximate trip generation purposes. Analyses from 2009 was updated to reflect currently adopted land use plans, development activity and trends, and growth patterns. The data set provided by CAMPO for the years 2020 and 2045 provided a breakout of population and employment by TAZ. CAMPO data is useful as it enables understanding of background growth beyond the city limits, as well as growth on regional arterials to be incorporated. For assumption



purposes, and to be consistent with city population totals, an interpolation of the population and employment numbers was calculated to derive the 2021 population and employment estimates by TAZ to better match city actuals and trends as reported by the U.S. Census in 2019. It is important to note that the TAZs do not follow city limits or water and wastewater service areas in some locations, so adjustments were made based on the locations of existing land uses and upon the percentage of each TAZ located within city limits. Employment for each TAZ was broken down into basic, retail, and service uses as defined by CAMPO, and in accordance with City adopted future land use plans. This data coupled with recent building permit activity and population data form the basis for 2021 population and employment by service area and presented in Table 3-3.

Table 3-3: Base Year (2021) Population and Employment by Roadway Service Area

Service Area	Population	Employment (Employees)			
		Basic	Retail	Service	Total
1	5,200	141	246	429	816
2	3,900	0	89	179	268
Total	9,100	141	335	608	1,084

3.5 TEN-YEAR GROWTH ASSUMPTIONS

Projected growth has been characterized in two forms: population and employment. A series of assumptions were made to arrive at reasonable growth projections for population and employment. FNI assumed a population growth rate of 5% and 3% based on residential permit data as discussed in Section 3.4. This growth trend is consistent with historic permit data and information of anticipated growth over the next 10-years. The following assumptions have been made as a basis from which 10-year projections could be initiated.

- Future land uses will occur based on similar trends/densities of the past and consistent with the 2030 *Comprehensive Plan*;
- Known planned development activities will occur; and
- The City will be able to finance the necessary improvements to accommodate continued growth.

The 10-year population projections are based upon incorporating the information on planned development densities provided by City staff. The 10-year employment projections are rooted in employment projections established by CAMPO and reallocated based upon development from the



updated traffic analysis conducted as part of the Thoroughfare Plan update and described above in Section 3.34. **Table 3-4** presents the population and employment for 2031 for each roadway service area.

Table 3-4: Population and Employment Projections (2031) for Roadway Service Area

Service Area	Population	Employment (Employees)			
		Basic	Retail	Service	Total
1	7,210	144	472	548	1,164
2	5,499	0	109	212	321
Total	12,709	144	581	760	1,486

3.6 SUMMARY

- The existing 2021 population for Lago Vista stands at approximately 9,100 persons, with an existing estimated employment of 1,084 jobs.
- The 10-year population projections are based upon incorporating the information of the Future Land Use Plan (2030 Comprehensive Plan) and planned development densities provided by City Staff. Employment estimates were used to calculate ten-year growth projections.
- Ten-year (2031) population is forecast to be 12,709 persons, with an employment of 1,486 jobs. This translates to a growth of 3,609 persons (about 3%/year) and 402 employees (about 3%/year), respectively, over the ten-year planning period.



4.0 ROADWAY CAPITAL IMPROVEMENTS PLAN

4.1 EXISTING CONDITIONS ANALYSIS

An inventory of major roadways that are designated as arterial and/or collector per the Thoroughfare Plan was conducted to determine: 1) capacity provided by the existing roadway system, 2) the demand currently placed on the system, and 3) the potential existence of deficiencies in the system. Any deficiencies found to occur will be carried over in the impact fee calculations (netting out capacity made available by the CIP). Data for the inventory were obtained from the Thoroughfare Plan and historic peak hour traffic volume count data compiled by StreetLight that was collected in February 2020, prior to effects of the COVID-19 pandemic. **Appendix A** contains a map of count locations.

The roadways were divided into segments based on changes in lane configuration, major intersections, city limits or area development that may influence roadway characteristics. For the assessment of individual segments, lane capacities were assigned to each segment based on roadway functional class, as defined by the City's Thoroughfare Plan, and type of existing cross-section and are listed in **Table 4-1**. Roadway hourly volume capacities are defined by link-level carrying capacity values based upon generally accepted capacities defined by the CAMPO regional travel demand modeling description for the suburban residential context at a level-of-service (LOS) "D" operation.

Table 4-1: Roadway Facility Vehicle Mile Lane Capacities

Roadway Facility Functional Classification	Designation	Hourly Vehicle-mile Capacity per Lane Mile of Roadway Facility
Divided Arterial*	DA/SA*	810
Divided Collector*	DC/SC*	510
Undivided Arterial	UA	680
Undivided Collector	UC	410

*Facilities with a two-way left turn lane (TWLTL) treated like a divided facility and marked with a Special Arterial (SA) or Special Collector (SC) designation.

4.1.1 Existing Volumes

Existing directional PM peak hour volumes were obtained by utilizing StreetLight traffic data. With StreetLight, historic data could be obtained from February 2020, prior to effects of lockdown from Covid. This information was supplemented with data from Texas Department of Transportation's (TxDOT) STARSII traffic count system.



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

4.1.2 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:

$$\text{Vehicle-Miles of Capacity} = \text{Link capacity per peak hour per lane} \times \text{No. of Lanes} \times \text{Length of segment (miles)}$$

The current capacity available on the roadway system by service area is summarized in **Table 4-2** and listed in detail in **Appendix A**.

4.1.3 Vehicle-Miles of Existing Demand

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

$$\text{Vehicle-Miles of Demand} = \text{PM peak hour volume} \times \text{Length of segment (miles)}$$

The total vehicle-miles of demand by service area are summarized in **Table 4-2**.

4.1.4 Vehicle-Miles of Existing Excess Capacity and Deficiencies

For each roadway segment, the existing vehicle-miles of excess capacity and/or deficiencies were calculated and are listed in **Table 4-2**. Each direction was evaluated to determine if vehicle demands (volumes) exceeded the available capacity. If demand in either direction exceeded capacity, this deficiency in the roadway network was documented as the excess demand over available capacity in that segment. The total deficiency in the network is deducted from the capacity supply associated with the impact fee capital improvement plan to account for excess demand in the network from existing development. A summary of peak hour excess capacity and deficiencies is also shown in **Table 4-2**. Any deficiencies identified under current operations will be carried over to the impact fee calculation. A detailed listing of existing excess capacity and deficiencies by roadway segment is also located in the **Appendix A**.



Table 4-2: Peak Hour Vehicle-Miles of Existing Capacity, Demand, Excess-Capacity, and Deficiencies

Service Area	Capacity	Demand	Excess Capacity	Existing Deficiencies
1	24,513	7,370	17,465	322
2	6,211	3,091	3,170	50
Total	30,724	10,461	20,635	372

4.2 GROWTH PROJECTIONS

The projected growth for the roadway service areas is represented by the increase in the number of new vehicle-miles of demand generated over the 10-year planning period. The basis for the calculation of new demand is the population and employment projections that were described in the previous Section 3.0.

Population growth in the LUA was converted to dwelling units using a factor of 2.54 persons per household obtained from the US Census. Employment growth data presented in the LUA were converted to square feet of development using estimated employees per square foot of gross floor area based on a range of values commonly found in modeling. The conversion of population to dwelling units and employment to square feet of development aligns the growth assumptions aligns with available trip generation trend rates. These trip rates allow estimation of service unit equivalencies for each demographic by land use type, allowing for the calculation of a total projected vehicle-miles of new demand in the 10-year horizon.

4.2.1 Projected Vehicle-Miles of New Demand

Projected vehicle-miles of demand were calculated based on the net growth expected to occur over the 10-year planning period, and on the associated 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 each service area. Vehicle-miles of demand for population growth were based on dwelling units (residential). Vehicle-miles of demand for employment were based on square footage of building space.

These growth assumptions were then multiplied by the service unit equivalency for vehicle-mile generation based on trip rates in the Institute for Transportation Engineer's (ITE) *Trip Generation, 10th Edition* and trip lengths derived from StreetLight analysis and from the CAMPO travel demand model, tailored to Lago Vista.



The 10-year projected vehicle-miles of demand by service area are summarized in **Table 4-3**. **Appendix B** details the derivation of the projected demand calculations.

Table 4-3: 10-Year Projected Service Units of Demand

Service Area	Projected 10-Year Growth (Vehicle-Miles)
1	3,271
2	2,109
Total	5,380

4.3 ROADWAY CAPITAL IMPROVEMENTS PLAN (CIP)

The impact fee CIP is aimed at facilitating long-term growth in Lago Vista. The recently adopted Thoroughfare Plan served as the basis from which impact fee CIP projects were initially identified. City Staff provided input on the timing of other agency assisted roadway projects. The roadway impact fee CIP considers in part, remaining capacity enhancements to the city arterial and collector system to achieve completion of the city's Thoroughfare Plan.

4.3.1 Eligible Projects

Legislative mandate stipulates that the impact fee CIP contain only those roadways classified as *arterial* or *collector* status facilities that are included in the City's adopted Thoroughfare Plan. Impact fee legislation also allows for the recouping of costs for previously constructed facilities and projects currently under construction. All these projects conform to the Thoroughfare Plan requirements and will consider only the costs incurred by the City for facility implementation.

4.3.2 Impact Fee CIP

The proposed CIP consists of 8 project segments spanning the two (2) service areas to advance the carrying capacity of the arterial and collector roadway network. The capacity and net capacity provided by the proposed CIP is summarized in **Table 4-4**. Net capacity provided by the proposed CIP takes into consideration current traffic on CIP roads and any deficiencies from the existing conditions analysis described in **Section 4.1** of this report. A detailed listing by project of capacity supplied can be found in **Appendix C**. A map of the projects is shown in **Figure 4.1**.



Table 4-4: Roadway Impact Fee Capital Improvements Plan Projects

Service Area	A	B	C = A - B	D	E = C - D
	Capacity Supplied by CIP (veh-mi)	Existing Utilization (veh-mi)	Excess Capacity (veh-mi)	Existing Deficiencies (veh-mi)	Net Capacity Supplied by CIP (veh-mi)
1	5,968	0	5,968	322	5,646
2	171	0	171	50	121
Total	6,139	0	6,139	372	5,767

A comparison of net capacity provided by the proposed CIP relative to 10-year needs (developed in Section 4.2) is listed in Table 4-5. The percent attributable to new growth is a direct result of the land use assumptions described earlier in the report. Based on the defined capital improvements plan, all the capacity supplied by the CIP will be consumed by 10-year growth. The resultant cost per service unit is calculated as the CIP cost attributed to growth (full cost of net capacity in this case) divided by the projected growth. The cost attributed to growth is limited by the projected growth, so because demand outpaces capacity supplied by CIP, the effect is that the resultant cost per service unit will be lower than a scenario where capacity supplied by the CIP meets or exceeds the projected growth.

Table 4-5: Projected Demand and Net Capacity Provided by the Proposed CIP

Service Area	A	B	B / A
	Net Capacity Supplied by CIP (veh-mi)	Projected 10-Year Growth (vehicle-mi)	(Max 100%)
1	5,646	3,271	57.9
2	121	2,109	100
Total	5,767	5,380	93.3

Figure 4-1 and Table 4-6 illustrate and list the capital improvement projects for the roadway impact fee program.



Figure 4-1: Roadway Impact Fee Capital Improvements Plan

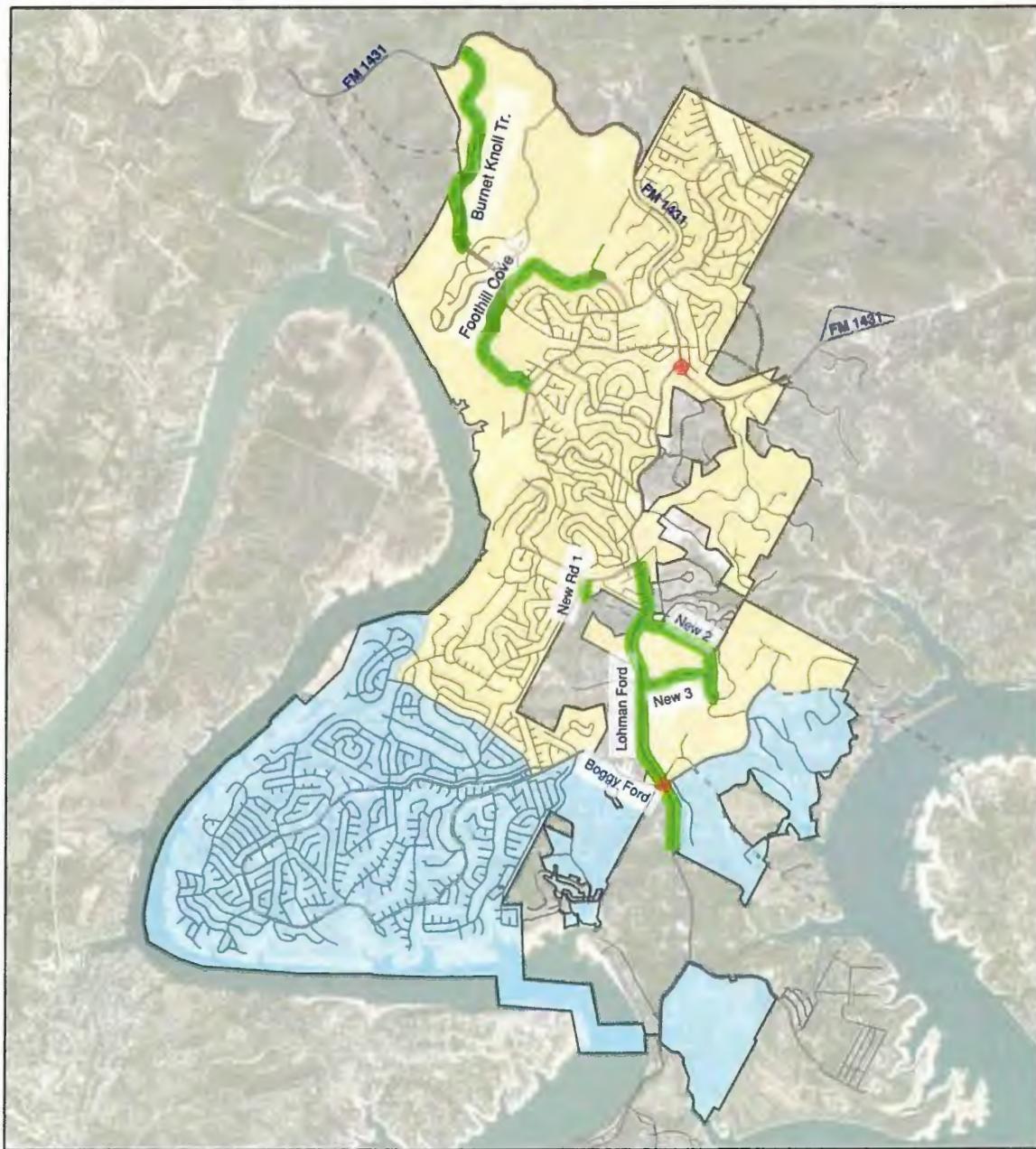




Table 4-6: Roadway Impact Fee Capital Improvements Plan Projects

Proj No.	Serv Area	Roadway	From	To	Length (mi)	Thoroughfare Section	Type	Roadway Improvement
1	1	Lohman Ford	Dawn	Shoreline Ranch	1.59	Minor Arterial	DA	Add 2 lanes to existing
2	1	New Road 1	Dawn	Bonanza Ext	0.10	Minor Collector	UC	Construct 2 new lanes
3	1	New Rd 2 (Bonanza Ext.)	Lohman Ford	Gary Player Dr	0.90	Minor Collector	UC	Construct 2 new lanes
4	1	New Road 3	Lohman Ford	New Rd 2 (Bonanza Ext.)	0.48	Minor Collector	UC	Construct 2 new lanes
5	1	Foothill Cove	Existing Roadway	Bar K Ranch (Paseo de Vaca)	1.42	Minor Collector	UC	Construct 2 new lanes
6	1	Barnet Knoll Trail	Existing Roadway	FM1431	1.23	Minor Collector	UC	Construct 2 new lanes
7	1	Lohman Ford / FM 1431 Intersection Improvements			0.01	Principal Arterial	SA	Intersect Imprnts.
Sub-Total Service Area 1								5.73
8	2	Lohman Ford	Boggy Ford	S. City Limit	0.57	Major Collector	TWLT	Construct Center Turn Lane
Sub-Total Service Area 2								0.57

Notes*:

DA - Divided Arterial

UA - Undivided Arterial

DC - Divided collector

UC - Undivided Collector



Appendix A: **Roadway Existing Conditions Analysis**

Lago Vista Roadway Impact Fee Study
Existing Capital Improvements Analysis

Land Use Assumptions and Capital Improvements Plan for Roads

Lago Vista Impact Fee Program

Serv Area	Roadway	From	To	Length (mi)	No. of Lanes	PM Peak Hour Volume			VMT Supply Pk Hr Total	VMT Demand Pk Hr Total	Excess VMT	Exist. VMT Deficiency	
						Type	A	B					
1	BAR K RANCH RD	BAR K CLUBHOUSE CT	FM 1431	1.56	2	UC	75	113	188	1,279	293	986	0
1	BAR K RANCH RD	FM1431	N END OF ROAD	1.69	2	UC	21	111	132	1,386	223	1,163	0
1	FM1431	W CITY LIMIT	TESSERA PKWY	1.25	2	UA	85	86	171	1,700	214	1,486	0
1	FM1431	TESSERA PKWY	BISON TRL	0.98	2	UA	93	122	215	1,339	212	1,128	0
1	FM1431	BISON TRL	1550 FT N OF BAR K RANCH RD	0.68	2	UA	253	252	505	923	343	581	0
1	FM1431	1550 FT N OF BAR K RANCH RD	BAR K RANCH RD	0.29	4	UA	328	386	714	798	210	589	0
1	FM1431	BAR K RANCH RD	LOHMAN FORD RD	0.55	4	UA	321	386	707	1,508	392	1,116	0
1	FM1431	LOHMAN FORD RD	700 FT E OF TYLER TRL (E CITY LIMIT)	1.26	4	UA	136	302	438	3,427	552	2,875	0
1	TESSERA PKWY	FM1431	1600 FT S OF FM1431	0.30	4	UC	8	36	44	497	13	484	0
1	TESSERA PKWY	1600 FT S OF FM1431	BURNET KNOll TRL	1.06	2	UC	7	35	42	869	45	825	0
1	TESSERA PKWY	BURNET KNOll TRL	CAPE TRAVIS BEND	0.63	2	UC	2	8	10	513	6	506	0
1	DODGE TRL	BAR K RANCH RD	FM1431	0.71	2	UC	65	65	130	579	92	488	0
1	RIDGEVIEW RD	BAR K RANCH RD	LOHMAN FORD RD	0.93	2	UC	60	60	120	761	111	650	0
1	PASEO DE VACAST	BAR K RANCH RD	LOHMAN FORD RD	1.32	2	UC	75	65	140	1,082	185	898	0
1	DAWN DR	N END OF ROAD	LAGO VISTA WAY	0.62	2	UC	20	40	60	506	37	469	0
1	DAWN DR	LAGO VISTA WAY	TRAVIS DR	0.62	4	UC	70	125	195	1,019	121	898	0
1	DAWN DR	TRAVIS DR	LOHMAN FORD RD	0.27	4	UC	75	115	190	435	50	384	0
1	LOHMAN FORD RD	FM4131	DAWN DR	1.50	4	UA	585	960	1,545	4,080	2,318	1,763	0
1	LOHMAN FORD RD	DAWN DR	RANCHO CIELO CT	0.89	2	UA	479	735	1,214	1,211	1,081	179	49
1	LOHMAN FORD RD	RANCHO CIELO CT	BOGGY FORD RD	0.73	2	UC	473	721	1,194	599	873	0	273
Sub-Total Service Area 1				17.84						24,513	7,370	17,465	322
2	LOHMAN FORD RD	BOGGY FORD RD	CITY LIMIT (S OF BOGGY FORD RD)	0.58	2	UC	162	237	399	477	232	245	0
2	LOHMAN FORD RD	SYLVESTER FORD RD	1000 FT S OF THURMAN RD	0.65	2	UC	75	117	192	536	125	410	0
2	BOGGY FORD RD	AMERICAN DR	MAC ARTHUR AVE	0.88	2	UC	161	244	405	724	357	366	0
2	BOGGY FORD RD	MAC ARTHUR AVE	HIGHLAND LAKE DR	1.12	2	UC	195	388	583	918	653	265	0
2	HIGHLAND LAKE DR	BOGGY FORD RD	200 FT W OF CONSTITUTION DR	0.21	2	UC	160	244	404	171	84	87	0
2	HIGHLAND LAKE DR	200 FT W OF CONSTITUTION DR	EISENHOWER AVE	0.81	2	DC	160	244	404	831	329	502	0
2	HIGHLAND LAKE DR	EISENHOWER AVE	100 FT N OF FORD COVE	0.67	2	UC	120	204	324	551	218	333	0
2	HIGHLAND LAKE DR	100 FT N OF FORD COVE	KEY COVE	0.26	2	DC	90	172	262	261	67	194	0
2	HIGHLAND LAKE DR	KEY COVE	AMERICAN DR	0.50	2	UC	60	133	193	412	97	315	0
2	BOGGY FORD RD	HIGHLAND LAKE DR	950 FT E OF LINCOLN CV	0.40	2	UC	225	410	635	325	251	73	0
2	BOGGY FORD RD	950 FT E OF LINCOLN CV	LOHMAN FORD RD	0.49	2	UC	325	512	837	404	412	42	50
2	SYLVESTER FORD RD	LOHMAN FORD RD	PATTY DR	0.73	2	UC	216	144	360	603	265	338	0
Sub-Total Service Area 2				7.31						6,211	3,091	3,170	50
Total										30,724	10,461	20,635	372

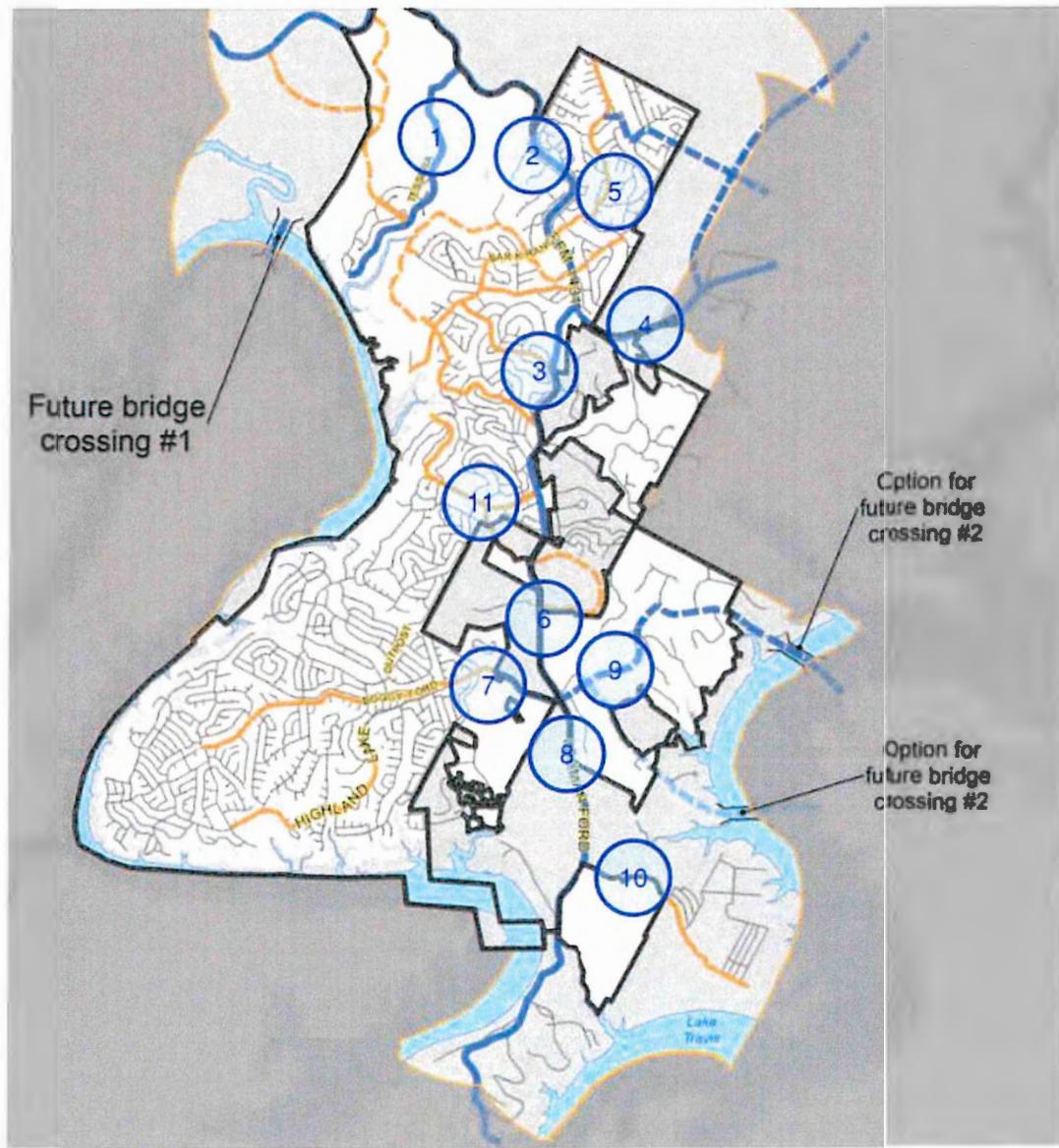
Notes:

- DA - Divided Arterial
- UA - Undivided Arterial
- DC - Divided collector
- UC - Undivided collector





Roadway Traffic Data Collection Locations





Appendix B:
Projected Roadway 10-Year Growth
(Vehicle-Miles of New Demand)



Vehicle-Mile Trip Generation by Service Area, Lago Vista Impact Fee Update

Based on 2021-2031 Land Use Assumptions dated June 2021

Service Unit Equivalency

Residential	3.19	Service Emp	2.92
Basic Emp	3.04	Retail Emp	3.09

Estimated Residential Growth Vehicle-Mile Trip Generation

Conversion Factor: 2.54 2010 persons/household

Service Area	Added Population	Added Dwelling Units	Vehicle-Miles per DU	Total Vehicle-Miles
1	2,010	791	3.19	2,523
2	1,599	630	3.19	2,010
Total	3,609	1,421		4,533

Estimated Basic Employment Growth Vehicle-Mile Trip Generation

Service Area	Added Employees	Total Square Feet	Vehicle-Miles per 1,000 Sq Ft	Total Vehicle-Miles
1	3	4,863	3.04	15
2	0	0	3.04	0
Total	3	4,863		15

Estimated Service Employment Growth Vehicle-Mile Trip Generation

Service Area	Added Employees	Total Square Feet	Vehicle-Miles per 1,000 Sq Ft	Total Vehicle-Miles
1	119	59,566	2.92	174
2	33	16,614	2.92	49
Total	152	76,179		223

Estimated Retail Employment Growth Vehicle-Mile Trip Generation

Service Area	Added Employees	Total Square Feet	Vehicle-Miles per 1,000 Sq Ft	Total Vehicle-Miles
1	226	180,886	3.09	559
2	20	16,208	3.09	50
Total	246	197,094		609

Total Vehicle-Mile Generation Summary

Service Area	Residential Growth Vehicle-Miles	Basic Emp Growth Vehicle-Miles	Service Emp Growth Vehicle-Miles	Retail Emp Growth Vehicle-Miles	Total Growth Vehicle-Miles
1	2,523	15	174	559	3,271
2	2,010	0	49	50	2,109
Total	4,533	15	223	609	5,380



Appendix C:

Roadway Capital Improvements Plan List



ROADWAY IMPROVEMENTS PLAN PROJECTS

Definitions

LANES	The total number of lanes in both directions available for travel.
TYPE	<p>The type of roadway (used in determining capacity):</p> <p>DA = divided arterial UA = undivided arterial SA = special arterial (arterial with continuous left turn) DC = divided collector UC = undivided collector SC = special collector (arterial with continuous left turn)</p>
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 PK-HR 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.
CIP VEH-MI DEFICIENCY	The number of service units used by existing traffic more than the available service units supplied by the roadway in the afternoon peak hour.

Lago Vista Roadway Impact Fee Study

10-Year Roadway CIP

Proj No.	Serv Area	Roadway	From	To	Length (mi)	Existing Lanes	Proposed Lanes*	Pct. in Serv. Area	Peak Hour Volume A	B	Total	VMT Supply Pk Hr Total
1	1	Lohman Ford	Dawn	Shoreline Ranch	1.59	2	4DA	100%	0	0	0	2,576
2	1	New Road 1	Dawn	Bonanza Ext	0.10	0	2UC	100%	0	0	0	78
3	1	New Rd 2 (Bonanza Ext.)	Lohman Ford	Gary Player Dr	0.90	0	2UC	100%	0	0	0	738
4	1	New Road 3	Lohman Ford	New Rd 2 (Bonanza Ext.)	0.48	0	2UC	100%	0	0	0	396
5	1	Foothill Cove	Existing Roadway	Bar K Ranch (Passeo de Vaca)	1.42	0	2UC	100%	0	0	0	1,164
6	1	Barnet Knoll Trail	Existing Roadway	FM1431	1.23	0	2UC	100%	0	0	0	1,009
7	1	Lohman Ford / FM 1431 Intersection Improvements			0.01	5		100%	0	0	0	7
Sub-Total Service Area 1					5.73							5,968
8	2	Lohman Ford	Boggy Ford	S. City Limit	0.57	1	TWLT	100%	0	0	0	171
Sub-Total Service Area 2					0.57							171

Notes*:

DA - Divided Arterial

UA - Undivided Arterial

DC - Divided collector

UC - Undivided Collector

