Air Quality Analysis Technical Report

US 79 from IH35 to east of FM 1460
Williamson County, Texas

CSJ: 0204-01-063

December 2019

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

TABLE OF CONTENTS

1.0 Air Quality 1
1.1 Introduction 1
1.2 Existing Facility 1
1.3 Proposed Facility 1
1.4 Traffic Data 2
1.5 Pollutants of Concern 2
1.6 Ambient Air Quality Standards 3
1.7 Attainment Status 5
1.8 Hot Spot Analysis Requirements 5
1.9 CO Traffic Air Quality Analysis 5
1.10 Mobile Source Air Toxics 5
1.10.1 Background 5
1.10.2 Motor Vehicle Emissions Simulator (MOVES) 6
1.10.3 MSAT Research 8
1.10.4 Project Specific MSAT Information 8
1.10.5 Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis 9
1.11 Congestion Management Process 11
2.0 Potential Impacts and Mitigation 11
2.1 Construction Impacts 11
3.0 Conclusions 11
4.0 List of Preparers 12

TABLES

Table 1: Projected ADT along the US 79 Project Corridor 2
Table 2: National Ambient Air Quality Standards for Criteria Pollutants 4

FIGURES

Figure 1. FHWA Projected National MSAT Emission Trends 2010 – 2050 for Vehicles Operating on Roadways Using EPA's MOVES2014a Model 7

APPENDICES

Appendix A: Project Location Map
Appendix B: Traffic Data

1.0 Air Quality

1.1 Introduction

This technical report identifies and assesses air quality impacts associated with the proposed improvements to United States Highway 79 (US 79) between Interstate 35 (IH-35) to Farm-to-Market Road 1460 (FM 1460) in Williamson County, Texas. The Texas Department of Transportation (TxDOT) Austin District is proposing roadway improvements to US 79 within the City of Round Rock and is shown on the **Project Location Map** in **Appendix A**. A detailed description of the proposed project is presented below.

1.2 Existing Facility

Within the project limits, US 79 consists of four 12-foot main lanes (two in each direction) with 10-foot outside shoulders. Some locations along the corridor have a central turn lane measuring 14 feet. The existing US 79 right-of-way (ROW) varies from 150 to 300 feet wide.

1.3 Proposed Facility

Proposed improvements include widening the existing US 79 roadway to add a third travel lane in each direction and installing a raised median for safety. Improvements to intersections would include overpasses at US 79/Mays Street and US 79/A.W. Grimes Blvd and altering the US 79/I-35 Intersection. Driveways and access points would be modified to improve safety and traffic flow. The proposed improvements also include installing shared-use paths on both sides of US 79 to improve pedestrian and bicycle accommodations. The proposed project would require approximately 8.97 acres of new right-of-way. Deep impacts are anticipated as part of the construction of a grade separation at the intersection of US 79 and Mays Street.

The proposed project would include a major reconfiguration of the intersection at US 79 and Mays Street. The addition of a partial cloverleaf interchange would replace the existing four-way traffic light to improve safety and enhance the flow of traffic from one corridor to the other. Two traffic lights would be added facilitating the left and right hand turns on and off Mays Street. The addition of an overpass would direct Mays Street traffic over US 79, thus avoiding the potential danger and congestion associated with the intersection.

A raised median is proposed along the center of US 79 throughout the majority of the project area. The addition of this median would limit access points on and off US 79 to five cross-street intersections, the interchange at Mays Street, and three designated turn lanes at breaks in the median. The five cross-street intersections are listed below:

- A.W. Grimes Blvd
- Sunrise Road
- Georgetown Street

- Egger Avenue
- Heritage Center

The proposed project would include the addition of an overpass at the intersection of US 79 and A.W. Grimes Blvd. The overpass would allow vehicles traveling in the left lanes along US 79 to go over A.W. Grimes Blvd without stopping, thus bypassing the intersection. The right lanes would direct traffic to the 4-way traffic light at the intersection of US 79 and A.W. Grimes Blvd, below the overpass bridge. This intersection would include turnaround lanes, protected left turn lanes, and pedestrian crosswalks and would facilitate the transfer of vehicles on and off US 79 and A.W. Grimes Blvd.

The proposed project occurs on 79.1 acres of existing right-of-way and 0.18 acre of existing easement. It would require approximately 10.32 acres of new right-of-way for a total project footprint of 89.53 acres.

1.4 Traffic Data

Appendix B includes the traffic data that SWCA Environmental Consultants (SWCA) used in the air quality analysis. A memorandum from TxDOT's Transportation Planning and Programming Division provided projected average daily traffic volumes and turning movements for baseline (2024) and proposed (2044) conditions (TxDOT 2017).

For the purposes of this analysis, SWCA examined the existing and proposed vehicular traffic data within the US 79 from IH-35 to east of FM 1460 project limits to determine potential air quality impacts along the proposed project corridor. SWCA also analyzed the construction-related activities to determine potential short-term impacts on air quality.

Topography and meteorology of the area in which the project is located would not seriously restrict dispersion of air pollutants. The traffic data used in the analysis was obtained from TxDOT's Transportation Planning and Programming Division on December 1, 2017. Traffic data for the estimated time of completion (ETC) year (2024) and the design year (2044) are shown in **Table 1**.

Table 1: Projected ADT along the US 79 Project Corridor

Location	ADT (vpd)	
	2024 (ETC year)	2044 (Design year)
US 79 from IH-35 to East of FM 1460	41,600	56,000

Source: TxDOT 2017

1.5 Pollutants of Concern

Pollutants that are most important for air quality impact assessments of roadway projects include emissions of carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x), and

particulate matter smaller than 10 and 2.5 microns (PM_{10} and $PM_{2.5}$, respectively). Ozone (O_3) is also found within urban ambient air quality environments and is formed downwind from source regions through chemical reactions involving NO_x and HCs in the presence of sunlight. However, the focus of an air quality assessment is on emission sources that can be traced directly to the project, which primarily includes motor vehicles. Ozone concentrations are regional in nature and are best analyzed through regional air quality modeling analyses.

Generally, CO is the primary pollutant used to indicate the potential for adverse air quality impacts from motor vehicles and at roadway intersections. Particulate matter emissions are also important if the local environment includes a high concentration of diesel emission sources, such as heavy trucks. In addition, mobile source air toxics (MSAT) emissions are associated with motor vehicle sources.

1.6 Ambient Air Quality Standards

In compliance with the requirements of the federal Clean Air Act (CAA) of 1970 and the Clean Air Act Amendments (CAAA) of 1977 and 1990, the U.S. Environmental Protection Agency (EPA) promulgated and adopted the National Ambient Air Quality Standards (NAAQS) to protect public health, safety, and welfare from known or anticipated effects of six criteria pollutants as listed in **Table 2**. The six criteria pollutants are O_3, CO, PM_{10}, $PM_{2.5}$, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). The NAAQS define allowable concentrations of pollutants that may be reached but not exceeded during a given period of time. The purpose of these standards is to primarily protect human health and secondarily, human welfare with a reasonable margin of safety.

Table 2 shows the NAAQS for each criteria pollutant, expressed in terms of parts per million (ppm) by volume or micrograms per cubic meter of air ($\mu g/m^3$). The primary standards have been established to protect public health. The secondary standards have been established to set limits to protect public welfare, which includes protection against damage to the built and natural environment.

Table 2: National Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Period	Standard	Primary NAAQS	Secondary NAAQS
Carbon Monoxide	1 hour	Not to be exceeded more than once per calendar year	35 ppm	None
	8 hours	Not to be exceeded more than once per calendar year	9 ppm	None
Lead	Rolling 3-month Average	Not to be exceeded	0.15 µg/m3	0.15 µg/m3
Nitrogen Dioxide	1 hour	The 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed this level	0.100 ppm	None
	Annual	Annual Mean	0.053 ppm	.053 ppm
Particulate Matter (PM_{10})	24 hours	Not to be exceeded more than once per year on average over 3 years	150 µg/m3	150 µg/m3
Particulate Matter ($PM_{2.5}$)	24 hours	The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed this level	35 µg/m3	35 µg/m3
	Annual	The 3-year average of the weighted annual mean concentrations from single or multiple community-oriented monitors must not exceed this level	12.0 µg/m3	15.0 µg/m3
Ozone	8 hours (2015 std)	The 3-year average of the fourth-highest daily maximum 8-hour average at each monitor within an area must not exceed this level	0.070 ppm	0.070 ppm
	8 hours (2008 std)	The 3-year average of the fourth-highest daily maximum 8-hour average at each monitor within an area must not exceed this level	0.075 ppm	0.075 ppm
Sulfur Dioxide	1 hour	The 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed this level	.075 ppm	None
	3 hours	Not to be exceeded more than once per year	None	0.5 ppm

Source: EPA 2017

1.7 Attainment Status

The EPA designates geographic areas in a state with respect to meeting the NAAQS as attainment, nonattainment, or unclassifiable. Areas transitioning from nonattainment to attainment are termed maintenance areas. The nonattainment areas are designated based on the degree of violation of the NAAQS. For ozone, the designations are extreme, severe, serious, moderate, and marginal.

The proposed project is located in Williamson County which is in an area in attainment or unclassifiable for all NAAQS; therefore, the transportation conformity rules do not apply.

1.8 Hot Spot Analysis Requirements

The proposed project is not located within a CO or PM nonattainment or maintenance area; therefore, a project level hot-spot analysis is not required.

1.9 CO Traffic Air Quality Analysis

Maximum traffic data for the ETC year 2024 and design year 2044 is 41,600 vehicles per day and 56,000 vehicles per day, respectively. A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that the CO standard would ever be exceeded as a result of any project with an average annual daily traffic (AADT) below 140,000. The AADT projections for the project do not exceed 140,000 vehicles per day; therefore, a Traffic Air Quality Analysis was not required.

1.10 Mobile Source Air Toxics

1.10.1 Background

Controlling air toxic emissions became a national priority with the passage of the CAAA, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal Register* 72:8430) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (). In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA) (https://www.epa.gov/national-air-toxics-assessment). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority, the list is subject to change and may be adjusted in consideration of future EPA rules.

1.10.2 Motor Vehicle Emissions Simulator (MOVES)

According to the EPA, MOVES2014 is a major revision to MOVES2010 and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2010.

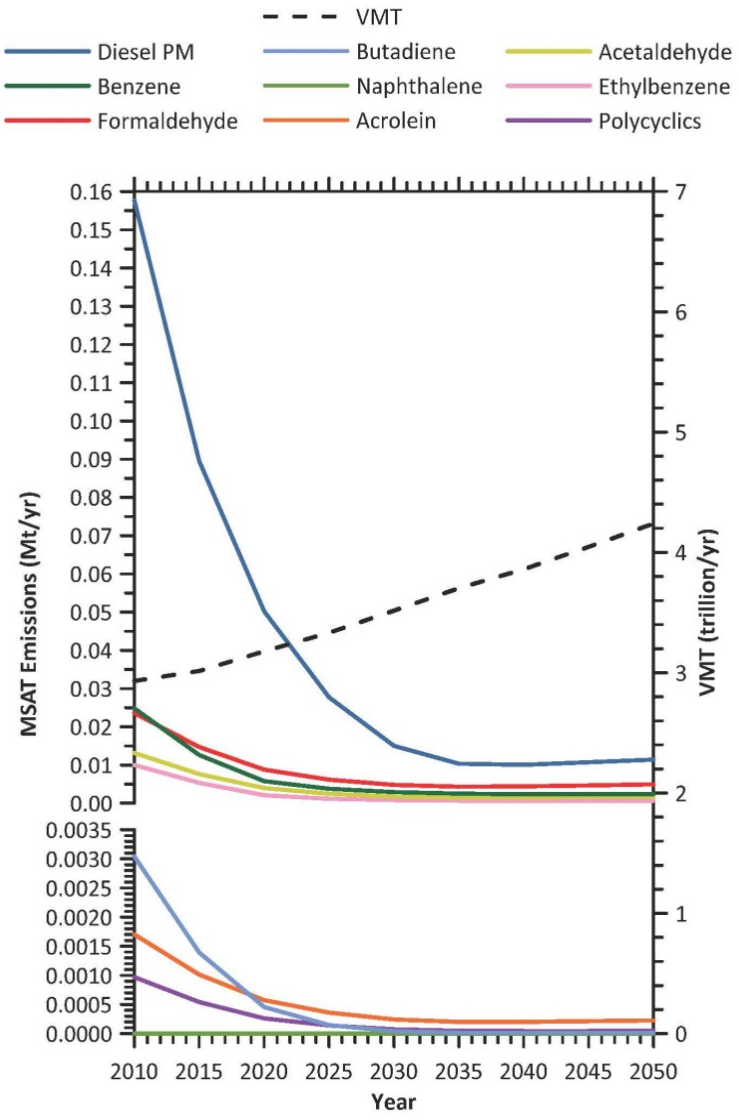
These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data. MOVES2014 incorporates the effects of three new federal emissions standard rules not included in MOVES2010.

These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017 (*Federal Register* 79:60344), heavy-duty greenhouse gas regulations that phase in during model years 2014-2018 (*Federal Register* 79:60344), and the second phase of light duty greenhouse gas regulations that phase in during model years 2017-2025 (*Federal Register* 79:60344).

Since the release of MOVES2014, EPA has released MOVES2014a. In the November 2015 MOVES2014a Questions and Answers Guide (https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNR0.txt), EPA states that for on-road emissions, MOVES2014a adds new options requested by users for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions. The change in brake wear emissions results in small decreases in PM emissions, while emissions for other criteria pollutants remain essentially the same as MOVES2014.

Using EPA's MOVES2014a model, as shown in Figure 1, FHWA estimates that even if VMT increases by 45% from 2010 to 2050 as forecast, a combined reduction of 91% in the total annual emissions for the priority MSAT is projected for the same time period.

Figure 1
FHWA PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050
FOR VEHICLES OPERATING ON ROADWAYS
USING EPA's MOVES2014a MODEL



Source: EPA MOVES2014a model runs conducted by FHWA, September 2016.

Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorological, and other factors.

Diesel PM is the dominant component of MSAT emissions, making up 50% to 70% of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES2014a will notice some differences in emissions compared with MOVES2010b. MOVES2014a is based on updated data on some emissions and pollutant processes compared to MOVES2010b, and also reflects the latest federal emissions standards in place at the time of its release. In addition, MOVES2014a emissions forecasts are based on lower VMT projections than MOVES2010b, consistent with recent trends suggesting reduced nationwide VMT growth compared to historical trends.

1.10.3 MSAT Research

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA. The FHWA, EPA, the Health Effects Institute (HEI), and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

1.10.4 Project Specific MSAT Information

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: https://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm.

The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at IH-35, Mays Street, and FM 1460/A.W. Grimes Blvd. However, the magnitude and the duration of these potential increases compared to the No Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific

MSAT health impacts. Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region- wide MSAT levels to be significantly lower than today.

1.10.5 Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the CAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the HEI. A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents (http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm). Adverse health effects linked to MSAT compounds at high exposures include: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects) or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts—each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete

differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk (EPA IRIS database, Diesel Engine Exhaust, Section II.C. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642.htm#quainhal)."

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable (https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf).

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

1.11 Congestion Management Process

The proposed project is located within an attainment or unclassifiable area for ozone and CO; therefore, a project level Congestion Management Process (CMP) analysis is not required.

2.0 Potential Impacts and Mitigation

2.1 Construction Impacts

During the construction phase of this project, temporary increases in PM and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site preparation, and the primary construction-related emissions of MSAT are diesel particulate matter from diesel powered construction equipment and vehicles.

The potential impacts of particulate matter emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: https://www.tceq.texas.gov/airquality/terp.

However, considering the temporary and transient nature of construction-related emissions, the use of fugitive dust control measures, the encouragement of the use of TERP, and compliance with applicable regulatory requirements; it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

3.0 Conclusions

The proposed project would not cause or exacerbate a violation of any NAAQS. There would be no adverse air quality impacts associated with the implementation of the proposed project. Therefore, no mitigation measures are proposed with respect to operational activities.

Construction activities have the potential to produce short-term, localized air quality impacts. Potential impacts include increased MSAT emissions from construction equipment and

vehicles and temporary impacts due to fugitive dust emissions. Mitigation measures to alleviate temporary impacts from construction activities are described in the previous section.

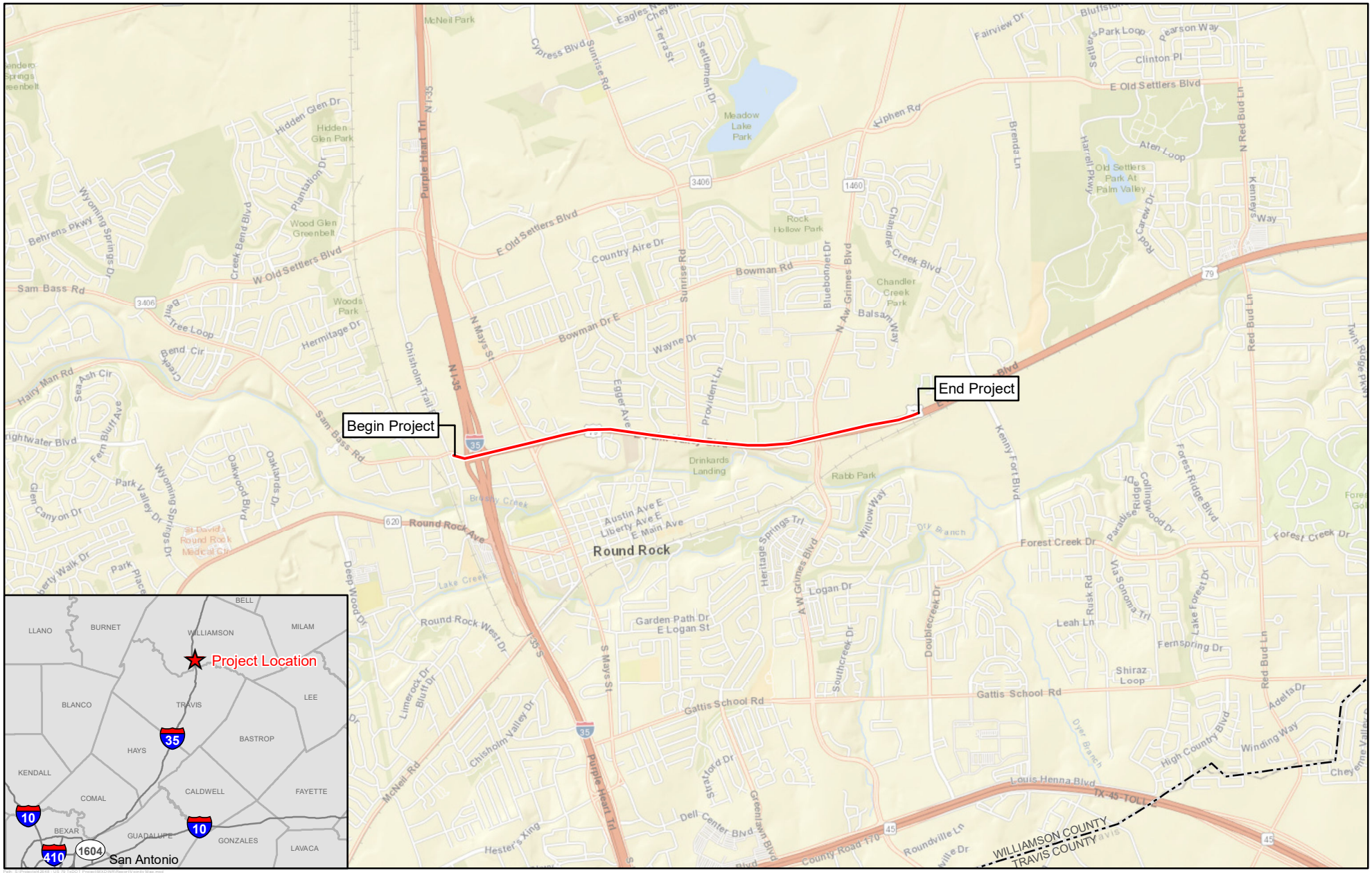
4.0 List of Preparers

Jefferey Wellman (Ecological Restoration Project Manager/Air Quality Analyst) – M.Ag./B.S. in Rangeland Ecology and Management, 20 years of NEPA / Traffic Noise experience.

Tom Allemand (Senior Project Manager) – M.S./B.S. in Aquatic Biology, 20 years of biology, environmental science and NEPA planning experience.

APPENDIX A

Project Location Map



US 79 FROM IH 35 TO EAST OF RM 1460
CSJ: 0204-01-063

PROJECT LOCATION MAP
WILLIAMSON COUNTY, TEXAS

FIGURE 1

Project Location
County Boundary

1:48,000

Created By: KS
Project Number: 42648
Date: 9/25/2018
NAD 1983 StatePlane Texas Central
FIPS 4203 Feet

0 1,000 2,000 3,000 4,000 Feet
0 300 600 900 1,200 Meters

APPENDIX B

Traffic Data

Texas Department of Transportation

MEMO

December 1, 2017

To: Terry G. McCoy, P.E., District Engineer
Lorena E. Echeverria De Misi, P.E., Director of TPD

Through: William E. Knowles, P.E.
Traffic Analysis Section Director, TPP

From: Gabriel Contreras
Planner III, TPP

Subject: Traffic Data
CSJ: 0204-01-063
US 79:
From I-35
To East of FM 1460

Williamson County

Attached is a corridor information packet for the described limits of the route.

Please refer to your original request dated June 28, 2017.

If you have any questions or need additional information, please contact Gabriel Contreras at (512) 486-5180.

Attachments

CC: Carmen Ramos, Planner, Austin District

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Austin District

December 1, 2017

Description of Location	Average Daily Traffic 2024	Average Daily Traffic 2044	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2024 to 2044) Flexible Pavement	S N	Rigid Pavement	SLAB
US 79 (Corridor Information Packet) DRAFT PROJECTIONS From I-35 To East of FM 1460 Williamson County	41,600	56,000	55 - 45	13.0	12.3	7.4	0	0	0	3	0	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	87.7	92.6
Medium Duty	1.0	0.6
Heavy Duty	11.3	6.8

Description of Location	Average Daily Traffic 2024	Average Daily Traffic 2054	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2024 to 2054) Flexible Pavement	S N	Rigid Pavement	SLAB
US 79 (Corridor Information Packet) DRAFT PROJECTIONS From I-35 To East of FM 1460 Williamson County	41,600	63,200	55 - 45	13.0	12.3	7.4	0	0	0	3	0	8"

Request for Traffic Data

Date: 06/28/2017

District: Austin **County:** Williamson **CSJ:** 0204-01-063

Highway: US 79

Limits: IH 35 to east of FM 1460

Texas Reference Marker System

From Marker: 562 From Displacement: 1.787 From DFO: 271.216

To Marker: 566 To Displacement: 0.243 To DFO: 273.556

Is it in the UTP: ☒ Yes ☐ No District Priority: 7 Est. Letting Date: 03/03/2022

Existing Number of Lanes: 4

Proposed Number of Lanes: 6

District Contact Person: Carmen Ramos

Phone Number: 512-832-7075

Please attach an 8-1/2" x 11" location map and make note of any existing or proposed development that will be a traffic generator. NOTE:

The following to be completed (Please mark information to be provided):

☒ 1. Basic Highway Traffic Data for pavement design
(No line diagram analysis required)
- A. Base year/ Beginning year: 2024
- B. Forecasted 20 year: 2044
- C. Forecasted 30 year: 2054
- D. Directional Distribution
- E. K-factor
- F. Percent Trucks ADT/DHV
- G. Average Ten Heaviest Wheel Loads (ATHWLD)
- H. Percent Tandem Axles in the ATHWLD
- I. One Directional cumulative 18 KSA at the end of the 20 years/30 years
- J. Slab Thickness (8" unless otherwise specified): _____
- K. Structural Number (3 unless otherwise specified): _____

☒ 2. Vehicle classification for environmental studies (Air and Noise Analysis)

☐ 3. Line diagram analysis (straight line turning movements; please provide line diagram).

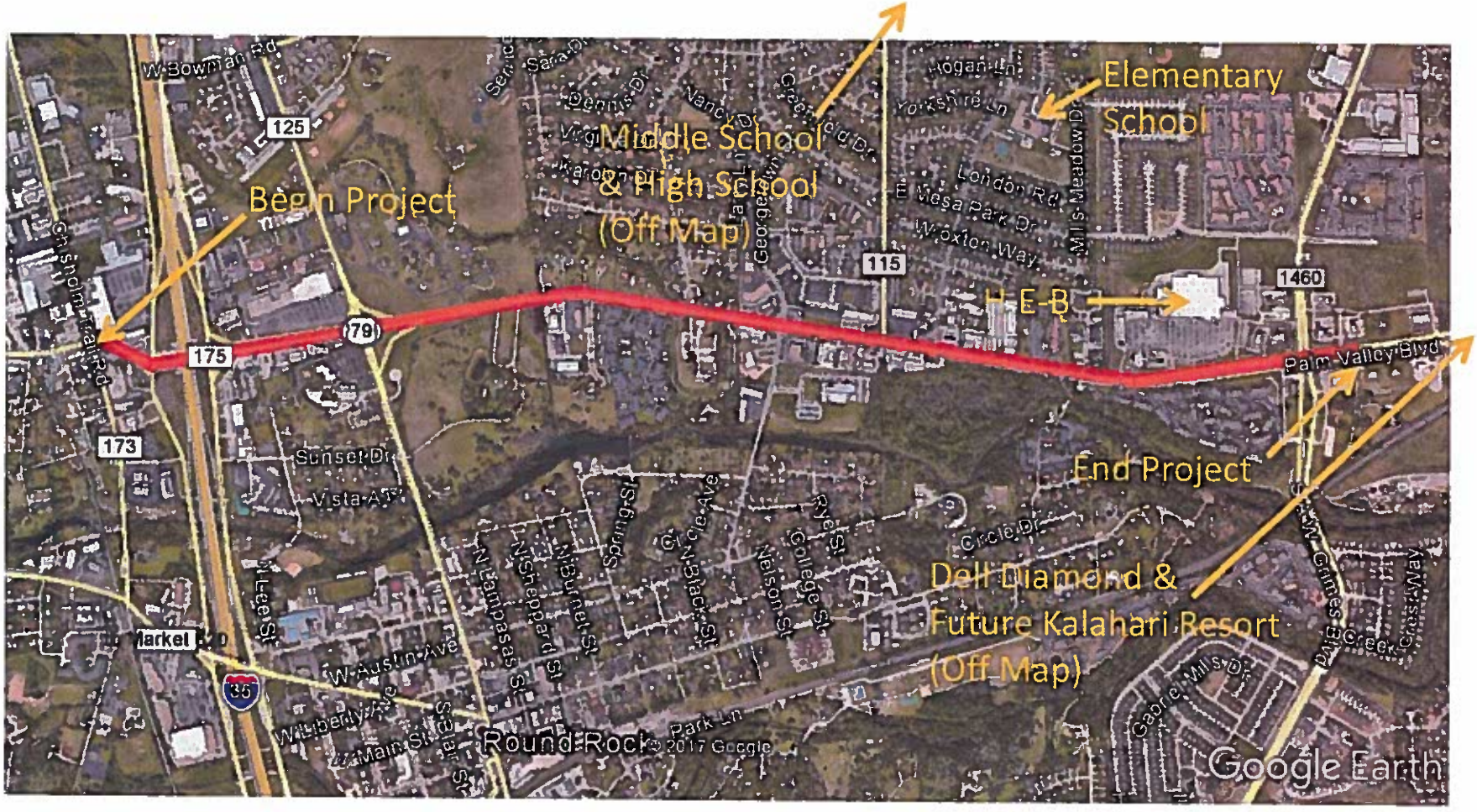
☐ 4. Complete Corridor Analysis (includes basic highway traffic data for pavement design, environmental studies and detailed schematic turning movements; *please provide detailed schematic*).

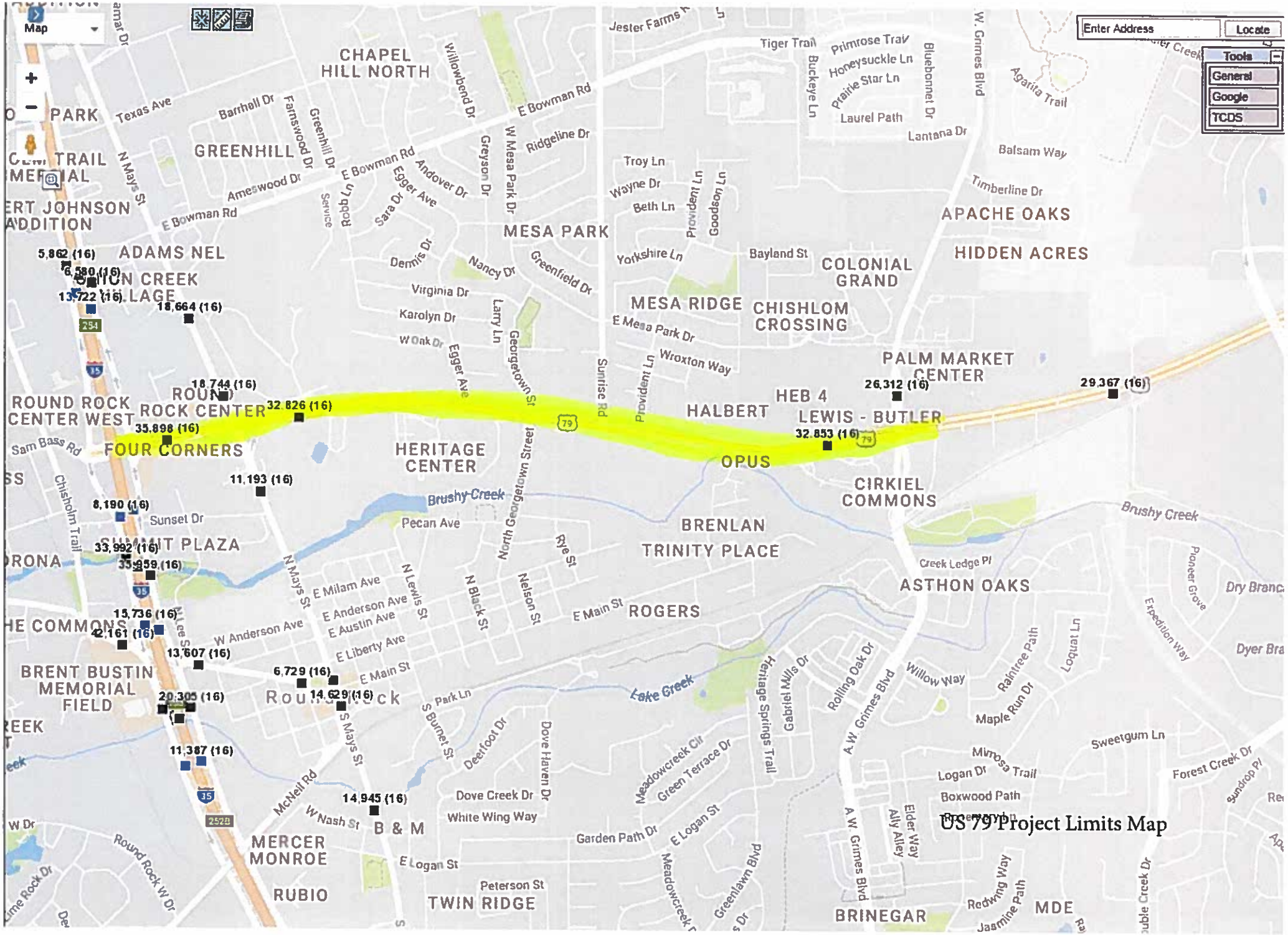
☒ 5. Consultant Corridor Information Packet

☐ 6. No build traffic analysis.
- ☐ EA
- ☐ EIS
- ☐ EA/EIS Reevaluation

Note: If complete corridor analysis is requested, please attach a traffic schematic diagram.

Project Location Map
0204-01-063
US 79 from IH 35 to east of FM 1460




Map
Enter Address
Locate
Tools
General
Google
TCDS
CHAPEL HILL NORTH
GREENHILL
MESA PARK
MESA RIDGE
CHISHLOM CROSSING
COLONIAL GRAND
APACHE OAKS
HIDDEN ACRES
PALM MARKET CENTER
HEB 4
HALBERT
LEWIS - BUTLER
OPUS
CIRKIEL COMMONS
BRENLAN
TRINITY PLACE
ASTHON OAKS
ROGERS
HERITAGE CENTER
FOUR CORNERS
ROUND ROCK CENTER
ROUND ROCK CENTER WEST
SUMMIT PLAZA
BRENT BUSTIN MEMORIAL FIELD
MERCER MONROE
RUBIO
TWIN RIDGE
B & M
BRINEGAR
MDE
Brushy Creek
Lake Creek
5,862 (16)
6,580 (16)
13,722 (16)
18,664 (16)
18,744 (16)
32,826 (16)
35,898 (16)
11,193 (16)
8,190 (16)
33,992 (16)
35,959 (16)
15,736 (16)
42,161 (16)
13,607 (16)
6,729 (16)
14,629 (16)
20,305 (16)
11,387 (16)
14,945 (16)
26,312 (16)
32,853 (16)
29,367 (16)
US 79 Project Limits Map

Corridor Analysis Worksheet: 1 Section, 2 Forecast Years, Air & Noise

Project	US 79 (Corridor Information Packet)	District	Austin
Rd Type	US	County	Williamson
Direction	Two-Way	CSJ	0204-01-063
Project	From I-35		
Limits	To East of FM 1460	Analyst	GAC

Date:	Request	6/28/2017	Received	6/28/2017	Started	12/1/2017	Completed 12/1/2017
District Contact	Carmen Ramos				Phone #		

	Year	ADT's			% Trks ADT	% Trks DHV
Count	2016	35898			12.3	7.4
Base	2024	41600	DRAFT	# Trks	5117	
Forecast	2044	56000	PROJECTIONS			
Forecast	2054	63200				

SPR Station	S-10	MC Stn	M-939	% Trks	20.0
Year	2016	Dir	SW	Num Trks	1938
Peak Hour	17.4	Year	2016	Axle Factor	2.91
DD	55	ADT	9679	% Single Axles	0.39
100-DD	45				
K-Factor	13.0				

Main Road Growth Rate	2.0	TDM Assignment	
Growth Rate after 20 Years	2.0		
20 Year Growth Factor	1.731		
30 Year Growth Factor	1.731	LOD	99999
Design Period 1	20		
Design Period 2	30		

				# Lanes	
Structural Number (SN)	3			Existing	4
Slab Thickness (ST)	8			Proposed	6

Past Projects	
Project	US 79
From	I-35
To	FM 1460
Date	4/23/2013
County	Williamson
CSJ	0204-01-06

Items Done on This Project

Straight Line Turning Movements		Detailed Schematic Turning Movements	
Traffic Analysis for Highway Design		Field Trip	
Vehicle Mix		Travel Demand Model Used	
Manual Count Worksheet			

NOTES:

These are DRAFT traffic projections based on the highest volume within the project limits.

DATA CALCULATIONS FOR USE IN AIR & NOISE ANALYSIS

FHWA Format Vehicle Class. Counts		
Light Duty Vehicles	Motorcycles	9
	Passenger	4386
	Pickup or Van	3346
Single Units	Buses	18
	Other 2 Axle	129
	3 Axles	61
	4 Axles or more	1
Truck Combs.	3-4 Axles	36
	5 Axles	1656
	6 Axles or more	16
Semi-Trailer-Trailer	5 Axles or less	15
	6 Axles	6
	7 Axles or more	0

	Number	%
Light	7741	80.0
Medium	165	1.7
Heavy	1773	18.3
Trucks	1938	20.0

SECTION 1

US

	ADT	DHV
Light	87.7	92.6
Medium	1.0	0.6
Heavy	11.3	6.8

Total Vehicles	9679
Total Trucks	1938
Total Singles	2217.0
Total Tandems	3430.0
AXLE FACTOR	2.91
SINGLE AX FACT	0.39

INPUT DATA FOR KIPS: AUTOMATIC

SN, ST	3, 8					
Design Periods	1	2				
Year 1	24	24				
Year 2	44	54				
ADT	41600	41600				
% Trks	12.3	12.3				
Growth Rate	1.731	1.731				
Years	20	30				
Facil Type	B	B				
S.N.	3	3				
SLAB	8	8				
Weight Sta	99999	99999				
Axle Factor	2.91	2.91				
Single Axle	0.39	0.39				

OUTPUT DATA FROM KIPS: ENTER FOR TAHD FORM

SN, ST	3, 8					
Design Periods	1	2				
ATHWLD						
% T in ATHWLD						
FLEXIBLE						
RIGID						

TRAFFIC VOLUME REGRESSION WORKSHEET

December 1, 2017

PROJECT: US 79
LIMITS: From I-35 to East of FM 1460
Main Rd. regressions along US 79 in project limits

Cross Street traffic regressions

District: Austin
County: Williamson
CSJ: 0204-01-063

ROUTE	US 79	US 79	US 79	US 79			Mays St-B 35	Mays St-B 35	FM 1460 (Cross Street)			
LOCATION	H-25	T-58	H-24	H-22			T-58A	T-56A	H-21			
1996	30000	27000	19900	17600			17900	11800	4400			
1997	30000	28000	19700	17700			18200	12800	5100			
1998	35000	32000	23000	21000			21000	13100	6600			
1999	28000	30000	23000	21000			21000	12600	7100			
2000	39000	35000	25000	23000			21000	16000	8400			
2001	40000	36000	28000	26000			22000	18300	10400			
2002	42000	35000	31000	25000			20000	15000	10100			
2003	42000	37000	32000	30000			20000	15900	10200			
2004	50000	41000	37000	33000			19900	14700	10000			
2005	46110	40250	36790	33100			20000	16900	10100			
2006	41000	45000	41000	34000			21000	18700	12100			
2007	48000	41000	41000	38000			22000	17000	12500			
2008	47000	39000	37000	35000			20000	16500	13400			
2009	46000	41000	36000	34000			18500	13000	16000			
2010	46000	40000	36000	33000			18800	12700	17300			
2011	41000	37000	33000	29000			17200	11600	17200			
2012	41000	37000	35000	31000			18400	11900	18900			
2013	43293	39703	38742	32023			21001	13655	21059			
2014	39236	35686	35701	29855			21801	14172	19294			
2015	33391	30644	30286	29660			21005	13655	23999			
2016	35898	32826	32853	29367			18744	11193	26312			
	Regr01	Regr02	Regr03	Regr04	Regr05	Regr06	Regr07	Regr08	Regr09	Regr10	Regr11	Regr12
Low Linear Annual Growth Rate	-0.1%	0.0%	0.8%	0.8%			-0.5%	-1.5%	2.6%			
Forecast Lnr. An. Grwth Rate	0.8% ☑	0.7% ☑	1.8% ☑	1.8% ☑	☐	☐	0.0% ☐	-0.5% ☐	4.2% ☐	☐	☐	☐
High Linear Annual Growth Rate	1.7%	1.5%	2.9%	2.8%			0.4%	0.5%	5.8%			
Estimated Standard Deviation	5826.33	4398.62	4802.91	4271.71			1423.24	2202.93	1451.25			
B (Slope)	352	292	724	635			-9	-71	962			
A (Intercept)	36663	33271	24754	22328			20060	15052	3734			
R=	0.351	0.381	0.683	0.678			-0.037	-0.196	0.972			
Confidence Interval	+/- 90% CI 378	+/- 90% CI 289	+/- 90% CI 399	+/- 90% CI 353			+/- 90% CI 86	+/- 90% CI 136	+/- 90% CI 373			
	Avg. of selected Forecast Linear Annual Growth Rates:					1.3%	Avg. of all Forecast Linear Annual Growth Rates:				1.3%	
GR's for Non-Regression vol's only												

PROJECTIONS OF ABOVE TRAFFIC VOLUME DATA TO FORECASTED YEARS

Use last Count Year from above. ☑

Do not use last Count Year from above. ☐
Enter any one of previous count years from above. 2010

Enter Base Year 2024

Pivot Growth Rate at 20 Years from Count Year (most commonly used). ☑

Pivot Growth Rate (GR) at other than 20 Years from Count Year. ☐
Enter years from Count Year for pivoting Growth Rate (e.g. for pivoting growth ten years from Count Year, enter 10) 10

Enter Model Year

Optional Input: SPR Station, Yr
Optional Input: K-Factor
Optional Input: Dir. Dist.

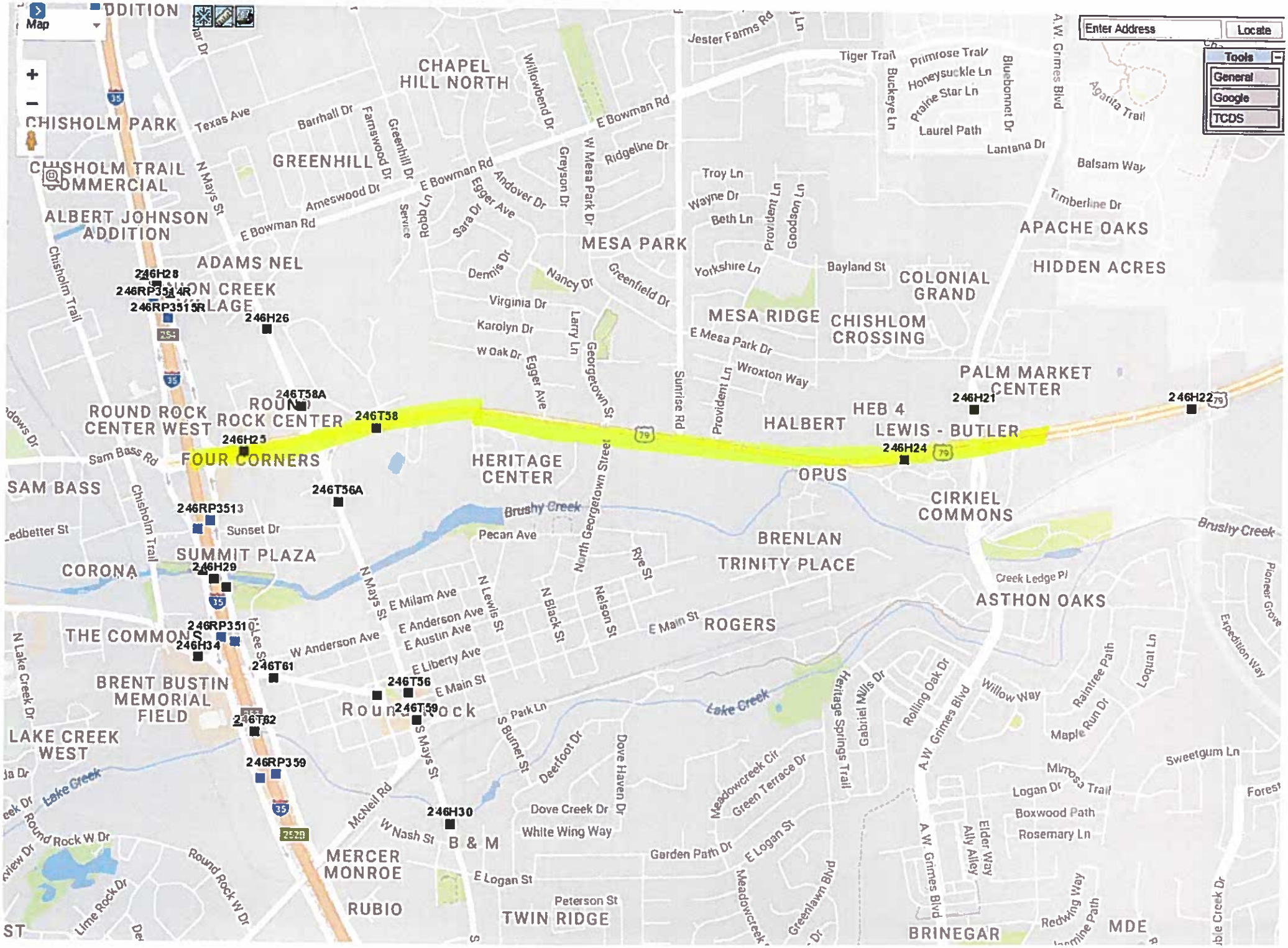
Enter Earliest Variable Year 2044
Enter Latest Variable Year 2054

Pre-20/Pivot Yr Growth Rates Selection

Use Relative Low & Non-Regression GR's	○	
Use Relative Frcst & Non-Regression GR's	○	
Use Relative High & Non-Regression GR's	○	
Use Avg. of Selected Low Growth Rates	○	0.4%
Use Avg. of Selected Forecast Growth Rates	○	1.3%
Use Avg. of Selected High Growth Rates	○	2.2%
Use Avg. of All Low Growth Rates	○	0.3%
Use Avg. of All Forecast Growth Rates	○	1.3%
Use Avg. of All High Growth Rates	○	2.2%
Use Highest Forecast Growth Rate	○	4.2%
Use Lowest Forecast Growth Rate	○	-0.5%
Use Manually Selected Growth Rate	●	2.0%

Post-20/Pivot Year Growth Rate Note: If Pre-20/Pivot Yr GR is 2.0% or less, that rate is used in the projections, not the rate below.
Enter Growth Rate (2.0% most common) 2.0%

ROUTE	US 79	US 79	US 79	US 79			Mays St-B 35	Mays St-B 35	FM 1460 (Cro			
LOCATION	H-25	T-58	H-24	H-22			T-58A	T-56A	H-21			
20/PIVOT YR AN. GROWTH RATE	2.0%	2.0%	2.0%	2.0%			2.0%	2.0%	2.0%			
Count Year - 2016	35898	32826	32853	29367			18744	11193	26312			
Base Year - 2024	41600	38100	38100	34100			21700	13000	30500			
Ten Year Forecast - 2034	48800	44600	44700	39900			25500	15200	35800			
Twenty Year Forecast - 2044	56000	51200	51300	45800			29200	17500	41000			
Thirty Year Forecast - 2054	63200	57800	57800	51700			33000	19700	46300			
Forty Year Forecast - 2064	70400	64300	64400	57600			36700	21900	51600			
GR Pivot Year Forecast - 2036	50300	46000	46000	41100			26200	15700	36800			
Earliest Var Yr Frcst - 2044	56000	51200	51300	45800			29200	17500	41000			
Latest Var Yr Frcst - 2054	63200	57800	57800	51700			33000	19700	46300			
Model Year Forecast - Model Traffic Assignment												
Difference of Model Yr Forecast from Model Traffic Assignment												
Above Difference in DDHV												
% Difference of Model Yr Forecast from Model Traffic Assignment												


Map
Enter Address
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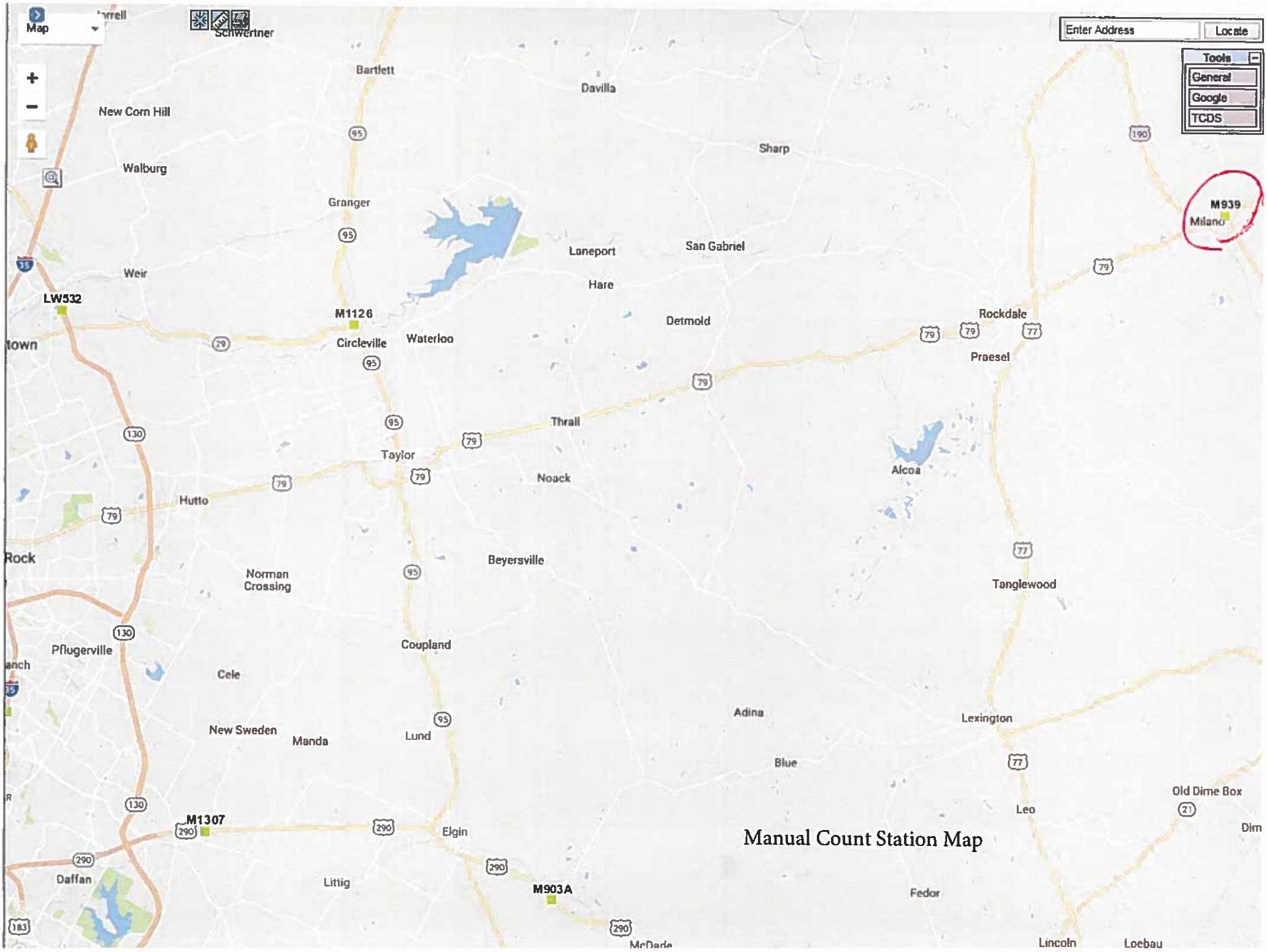
TCDS
CHAPEL HILL NORTH
CHISHOLM PARK
CHISHOLM TRAIL COMMERCIAL
GREENHILL
ALBERT JOHNSON ADDITION
ADAMS NEL
MESA PARK
MESA RIDGE
COLONIAL GRAND
CHISHLOM CROSSING
APACHE OAKS
HIDDEN ACRES
PALM MARKET CENTER
HEB 4
HALBERT
LEWIS - BUTLER
ROUND ROCK CENTER WEST
ROUND ROCK CENTER
FOUR CORNERS
HERITAGE CENTER
OPUS
CIRKIEL COMMONS
SAM BASS
SUMMIT PLAZA
CORONA
BRENLAN
TRINITY PLACE
ASTHON OAKS
ROGERS
THE COMMONS
BRENT BUSTIN MEMORIAL FIELD
LAKE CREEK WEST
Round Rock
B & M
MERCER MONROE
RUBIO
TWIN RIDGE
BRINEGAR
MDE
246H28
246RP3514R
246RP3515R
246H26
246T58A
246T58
246H25
246H21
246H22
246H24
246T56A
246RP3513
246H29
246RP3510
246H34
246T61
246T56
246T59
246T62
246RP359
246H30
Brushy Creek
Lake Creek
Texas Ave
Barrhall Dr
Farmswood Dr
Greenhill Dr
Willowbend Dr
E Bowman Rd
Jester Farms Rd
Tiger Trail
Primrose Trail
Honeysuckle Ln
Prairie Star Ln
Buckeye Ln
Bluebonnet Dr
A.W. Grimes Blvd
Agarita Trail
Laurel Path
Lantana Dr
Balsam Way
Timberline Dr
Ridgeline Dr
Greyson Dr
W Mesa Park Dr
Andover Dr
Egger Ave
Robb Ln
Sara Dr
Ameswood Dr
Service
Troy Ln
Wayne Dr
Beth Ln
Provident Ln
Goodson Ln
Yorkshire Ln
Bayland St
Dennis Dr
Nancy Dr
Greenfield Dr
Virginia Dr
Karolyn Dr
W Oak Dr
Larry Ln
Georgetown St
E Mesa Park Dr
Wroxton Way
Sunrise Rd
Chisholm Trail
N Mays St
Sam Bass Rd
Sunset Dr
Pecan Ave
North Georgetown Street
Rye St
Creek Ledge Pl
Pioneer Grove
Expedition Way
E Milam Ave
E Anderson Ave
E Austin Ave
N Lewis St
N Black St
Nelson St
E Main St
W Anderson Ave
E Liberty Ave
Lee St
Park Ln
S Burnet St
Deerfoot Dr
Dove Haven Dr
Heritage Springs Trail
Gabriel Mills Dr
Rolling Oak Dr
Willow Way
Raintree Path
Loquat Ln
Maple Run Dr
Sweetgum Ln
Mimosa Trail
Logan Dr
Boxwood Path
Rosemary Ln
Forest
Meadowcreek Cir
Green Terrace Dr
Dove Creek Dr
White Wing Way
Garden Path Dr
E Logan St
Meadowcreek
Greenlawn Blvd
Elder Way
Ally Alley
Redwing Way
Jasmine Path
McNeil Rd
W Nash St
S Mays St
Round Rock W Dr
Lime Rock Dr
Peterson St
N Lake Creek Dr
Leadbetter St
Chisholm Trail
Dowdy Dr
Creek Dr



Manual Count Station Map

Texas Department of Transportation

MS2

Traffic Count Database System (TCDS)

Classification Report

Location ID	M939_SW	**Located On**	US 79	**County**	Milam
Counted By		**AT**	SH 36	**Community**	-
Start Date	Thu 11/10/2016	**Loc On Alias**		**Station**	M939_SW
Start Time	12:00:00 AM	**Direction**	SW	**Agency**	Texas DOT
Source		**Sensor Type**		**Owner**	Stacey Lewis
Axle Factor	0.787	**Count Status**	Accepted		
Filename	M-939.16				

FHWA-Scheme F Classification

Start Time	Motor cycle	Car	Pick up	Bus	2A SU	3A SU	>3A SU	<5A 2U	5A 2U	>5A 2U	<6A >2U	6A >2U	>6A >2U	14	15	TOTAL
12:00 AM	0	20	13	0	1	0	0	0	24	0	3	1	0	0	0	62
1:00 AM	0	19	11	0	0	2	0	0	25	0	0	0	0	0	0	57
2:00 AM	0	14	10	0	1	0	0	0	34	0	0	0	0	0	0	59
3:00 AM	0	17	11	0	1	0	0	1	32	0	1	0	0	0	0	63
4:00 AM	0	28	30	1	2	4	0	0	35	1	1	0	0	0	0	102
5:00 AM	0	62	72	0	2	3	0	1	58	1	0	0	0	0	0	199
6:00 AM	0	142	142	3	6	1	0	3	70	0	0	2	0	0	0	369
7:00 AM	0	283	191	2	6	2	0	1	79	2	0	0	0	0	0	566
8:00 AM	0	189	181	0	7	2	0	4	102	1	1	0	0	0	0	487
9:00 AM	0	202	193	3	12	1	0	0	89	2	0	0	0	0	0	502
10:00 AM	0	231	205	0	11	3	0	8	98	0	0	0	0	0	0	556
11:00 AM	0	208	185	0	15	7	0	0	114	0	0	0	0	0	0	529
12:00 PM	1	252	225	0	12	5	0	1	78	2	1	0	0	0	0	577
1:00 PM	4	321	235	0	7	8	1	2	97	2	0	0	0	0	0	677
2:00 PM	1	301	240	2	10	5	0	5	89	1	0	0	0	0	0	654
3:00 PM	0	378	287	1	14	3	0	3	96	0	1	0	0	0	0	783
4:00 PM	3	392	281	5	4	3	0	1	95	2	0	0	0	0	0	786
5:00 PM	0	377	243	0	3	3	0	2	117	2	0	1	0	0	0	748
6:00 PM	0	335	203	0	6	2	0	1	81	0	1	0	0	0	0	629
7:00 PM	0	223	151	0	4	3	0	0	51	0	0	1	0	0	0	433
8:00 PM	0	134	77	0	2	1	0	1	50	0	1	0	0	0	0	266
9:00 PM	0	91	83	1	1	1	0	1	54	0	0	0	0	0	0	232
10:00 PM	0	120	47	0	0	2	0	0	45	0	1	0	0	0	0	215
11:00 PM	0	47	30	0	2	0	0	1	43	0	4	1	0	0	0	128
TOTAL	9	4386	3346	18	129	61	1	36	1656	16	15	6	0	0	0	9679

MANUAL COUNT DESIGN DATA - FHWA FORMAT

Station Number M-939 **Direction** SW **Year** 2016

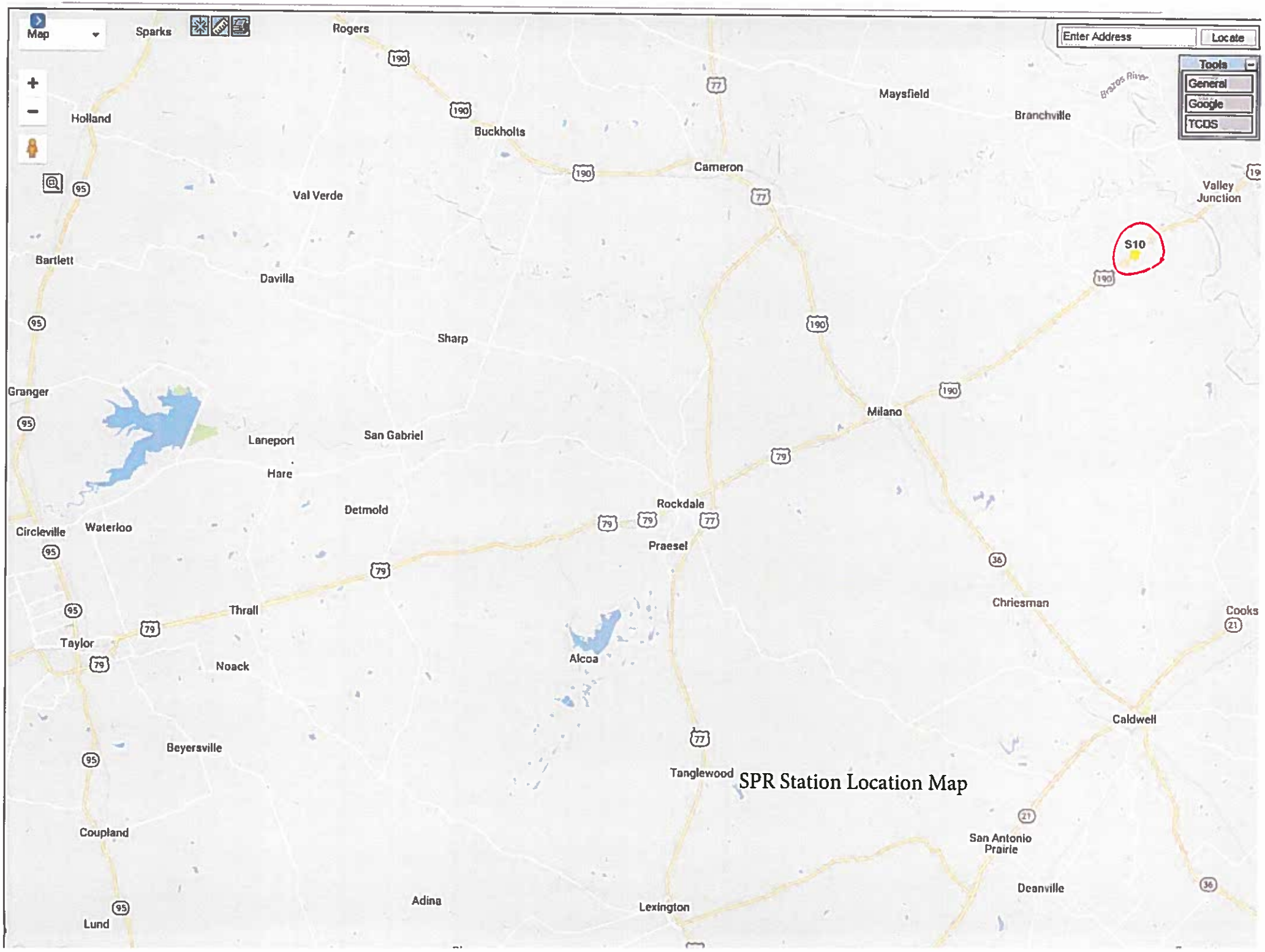
Optional Misc. Info. (loc., etc.)

Type of Truck		Number of Trucks	Single Axles Mult.		Tandem Axle Sets Mult.	
Single Units						
Buses	4	18	2	36	0	0
2-D	5	129	2	258	0	0
3-Axle	6	61	1	61	1	61
4-Axle	7	1	1	1	1	1
Single Trailer						
3-4-Axle	8	36	2.5	90.0	0.5	18.0
5-Axle	9	1656	1	1656	2	3312
6-Axle	10	16	1	16	2	32
Multi-Trailers						
5-Axle	11	15	5	75	0	0
6-Axle	12	6	4	24	1	6
7-Axle	13	0	3	0	2	0
Total		1938		2217.0		3430.0

(Singles + Tandems) / Total Trucks = Axle Factor	2.91
(Singles Axles / (Singles + Tandems))	0.39

Light Duty Vehicles	Motorcycles	9
	Passenger Cars	4386
	Pickup or Van	3346
Single Units	Buses	18
	Other 2 Axle	129
	3 Axles	61
	4 Axles or more	1
Single Trailer	3-4 Axles	36
	5 Axles	1656
	6 Axles or more	16
Multi-Trailers	5 Axles or less	15
	6 Axles	6
	7 Axles or more	0

Light	7741
Medium	165
Heavy	1773
Trucks	1938
Total Vehicles	9679
%T of Tot. Veh.	20.0
Num. of Trucks	1938
Axle Factor	2.91
% Single Axles	0.39



SPR Station Location Map

Transportation Planning and Programming Division's
Statewide Traffic Analysis and Reporting System II

High Hourly Volumes for Year for 1/1/2016 - 12/31/2016

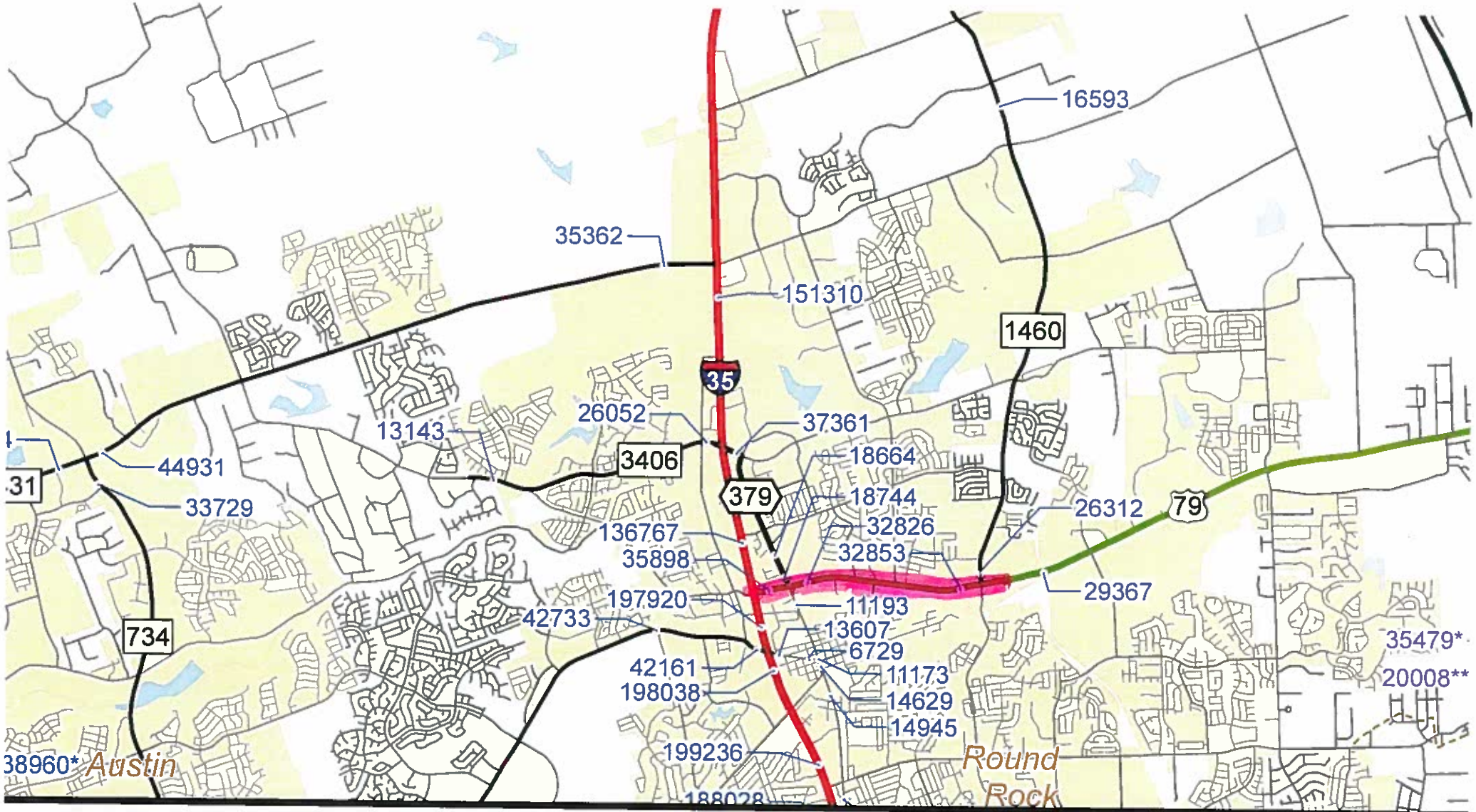
District : Bryan
Route:
Location ID : S10

County : Milam
Collection Type : PERM

Community : Hearne
On Road: US0079
AADT: 6,203
Roadbed : ML

Ordinal High Hour	Date	Day of Week	Hour	Volume	K Factor	Peak Direction	Directional Distribution
1	11/23/2016	Wednesday	3pm-4pm	1078	17.4	NB	58
2	11/27/2016	Sunday	2pm-3pm	1065	17.2	NB	52
3	11/23/2016	Wednesday	4pm-5pm	1027	16.6	NB	58
4	11/27/2016	Sunday	3pm-4pm	1025	16.5	SB	54
5	11/27/2016	Sunday	4pm-5pm	1020	16.4	SB	56
6	11/27/2016	Sunday	1pm-2pm	1012	16.3	SB	50
7	11/23/2016	Wednesday	2pm-3pm	982	15.8	NB	60
8	11/23/2016	Wednesday	5pm-6pm	932	15	NB	58
9	11/23/2016	Wednesday	1pm-2pm	931	15	NB	56
10	9/5/2016	Monday	3pm-4pm	921	14.8	NB	54
20	3/20/2016	Sunday	4pm-5pm	850	13.7	SB	50
25	3/20/2016	Sunday	2pm-3pm	818	13.2	NB	51
30	3/27/2016	Sunday	6pm-7pm	804	13	SB	55
35	11/18/2016	Friday	4pm-5pm	793	12.8	NB	58
40	11/25/2016	Friday	11am-12pm	772	12.4	NB	50
40	11/25/2016	Friday	11am-12pm	772	12.4	SB	50
45	9/30/2016	Friday	4pm-5pm	753	12.1	NB	51
50	5/6/2016	Friday	5pm-6pm	746	12	NB	52
75	11/22/2016	Tuesday	3pm-4pm	714	11.5	SB	52
100	10/14/2016	Friday	5pm-6pm	690	11.1	SB	51
125	11/18/2016	Friday	3pm-4pm	679	10.9	NB	54
150	10/16/2016	Sunday	1pm-2pm	667	10.8	NB	52
175	4/29/2016	Friday	5pm-6pm	654	10.5	NB	50
200	8/19/2016	Friday	5pm-6pm	641	10.3	NB	51

This information has been prepared for internal use within the
Texas Department of Transportation.



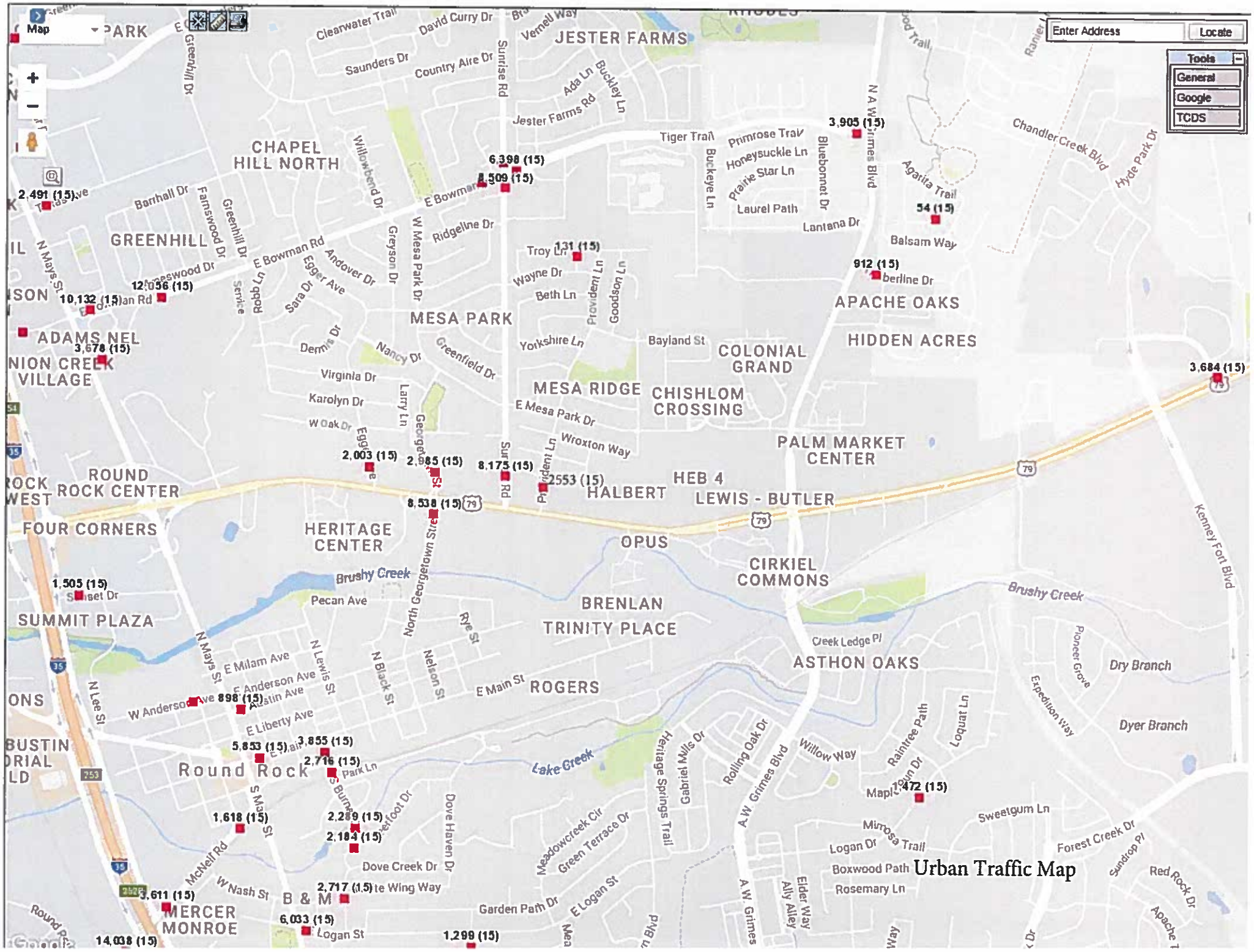
2016 AUSTIN DISTRICT TRAFFIC MAP

PREPARED BY THE

Texas Department of Transportation

Transportation Planning and Programming Division

Traffic Analysis System Support Branch


Map
Enter Address
Locate
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TCDS
JESTER FARMS
CHAPEL HILL NORTH
GREENHILL
MESA PARK
APACHE OAKS
HIDDEN ACRES
COLONIAL GRAND
MESA RIDGE
CHISHLOM CROSSING
PALM MARKET CENTER
HEB 4
HALBERT
LEWIS - BUTLER
ROUND ROCK CENTER
FOUR CORNERS
HERITAGE CENTER
OPUS
CIRKIEL COMMONS
BRENLAN
TRINITY PLACE
SUMMIT PLAZA
ASTHON OAKS
ROGERS
Round Rock
MERCER MONROE
B & M
Brushy Creek
Lake Creek
Dry Branch
Dyer Branch
Urban Traffic Map
2,491 (15)
12,056 (15)
10,132 (15)
3,678 (15)
6,398 (15)
8,509 (15)
3,905 (15)
54 (15)
131 (15)
912 (15)
3,684 (15)
2,003 (15)
2,985 (15)
8,175 (15)
2553 (15)
8,538 (15)
1,505 (15)
898 (15)
5,853 (15)
3,855 (15)
2,716 (15)
1,472 (15)
1,618 (15)
2,289 (15)
2,184 (15)
2,717 (15)
3,611 (15)
6,033 (15)
14,038 (15)
1,299 (15)

File

MEMORANDUM

TO: Greg Malatek, P.E.

DATE: April 23, 2013

FROM: William E. Knowles, P.E.

SUBJECT: Traffic Data
CSJ: 0204-01-06
US 79:
From I-35
To FM 1460

Williamson County

Attached is a copy of a schematic depicting 2013, 2033 and 2043 anticipated average daily traffic volumes and turning movements along US 79 specified in your request. Also attached are tabulations showing traffic analysis for highway design for the 2013 to 2033 twenty year period and 2013 to 2043 thirty year period for the described limits of the route. Included is a tabulation showing data for use in air and noise analysis.

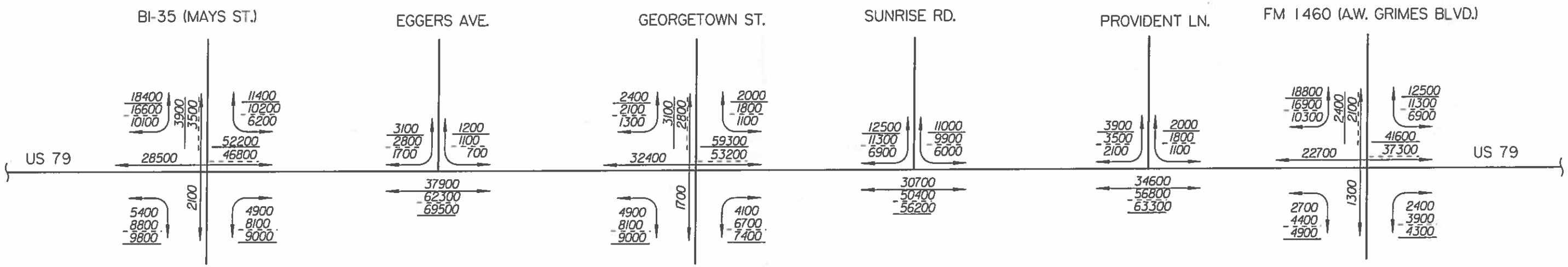
Please refer to your original memorandum dated March 25, 2013.

If you have any questions or need additional information, please contact Robert Williams at (512) 486-5145.

Attachments

cc: Ed Collins, Austin District
Design Division

PAST PROJECT



NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.
Serial Number 84704

LEGEND
1000 - 2013 ADT
1000 - 2033 ADT
1000 - 2043 ADT

2013, 2033 AND 2043 ANTICIPATED AVERAGE DAILY TRAFFIC VOLUMES AND TURNING MOVEMENTS AT SPECIFIED POINTS ALONG U.S. 79 FROM I-35 TO FM 1460
WILLIAMSON COUNTY

TRANSPORTATION PLANNING AND PROGRAMMING DIVISION
APRIL 29, 2013

PP

SHEET 1 OF 1

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Austin District

April 23, 2013

Description of Location	Average Daily Traffic 2013	Average Daily Traffic 2033	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2013 to 2033) Flexible Pavement	S N	Rigid Pavement	SLAB
US 79 From I-35 To FM 1460 Williamson County	44,000	72,200	53 - 47	12.8	14.9	8.9	12,900	40	30,473,000	3	42,692,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	85.1	91.1
Medium Duty	4.1	2.5
Heavy Duty	10.8	6.4

NOT INTENDED FOR CONSTRUCTION
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E.
Serial Number 84704

Description of Location	Average Daily Traffic 2013	Average Daily Traffic 2043	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2013 to 2043) Flexible Pavement	S N	Rigid Pavement	SLAB
US 79 From I-35 To FM 1460 Williamson County	44,000	80,400	53 - 47	12.8	14.9	8.9	13,000	40	48,936,000	3	68,558,000	8"

Texas Department of Transportation

FILE TPP
WD ☐ ___ JLR ☐ ___ A ☐ ___ M ☐ ___ S ☐
D ☐ ___ ☐ ___ P ☐ ___ T ☐ ___ File

MEMORANDUM

To: Bill Knowles
Transportation Planning and Programming

Date: March 25, 2013

From: Elizabeth Prestwood Elizabeth Prestwood
Transportation Planning and Development, Austin District

Subject: Traffic Request

County:	Williamson
CSJ:	0204-01-06
Highway:	US 79
Limits:	From IH 35 to FM 1460

I am attaching the following documents that explain the request:

1. Completed TRAFFIC REQUEST FORM
2. Project Location Map
3. Revised District Priority List

In addition, a layout with known traffic generators that would affect the project limits is also attached.

If you have any questions, please feel free to contact me at 832-7284.

PP

RECEIVED TPP
0377 MAR 27 13

REQUEST FOR TRAFFIC DATA

Form 2124
(6/2004)
Page 1 of 1

Date: 3/5/13

District: 14 **County:** Williamson **CSJ:** 0204-01-06

Highway: US 79
Limits: From IH 35 to FM 1460

Texas Reference Marker System
From Marker: 564 From Displacement: 0.320 From DFO: 272.036
To Marker: 564 To Displacement: 01.968 To DFO: 273.684

Is it in the UTP? ☐ Yes ☒ No District Priority: Est. Letting Date:

RECEIVED
MAR 27 2013
BY TPP

Existing Number of Lanes: 5
Proposed Number of Lanes: 7

District Contact Person: Ed Collins
Phone Number: 512/832-7041

Please attach an 8-1/2" x 11" location map and make note of any existing or proposed development that will be a traffic generator.

The following to be completed (Please mark information to be provided):

☒ 1. Basic Highway Traffic Data for pavement design
(No line diagram analysis required)
- A. Base year/Beginning year: 2013
- B. Forecasted 20 year: 2033
- C. Forecasted 30 year: 2043
- D. Directional Distribution
- E. K-factor
- F. Percent Trucks ADT/DHV
- G. Average Ten Heaviest Wheel Loads (ATHWLD)
- H. Percent Tandem Axles in the ATHWLD
- I. One Directional cumulative 18 KSA at the end of the 20 years/30years
- J. Slab Thickness (8" unless otherwise specified): _____
- K. Structural Number (3 unless otherwise specified): _____

ALSO NEED TURNING MOVEMENT COUNTS AT THE FOLLOWING INTERSECTIONS:
- BI-35 (MAYS ST)
- EGGER AVE
- GEORGETOWN ST
- SUNRISE RD
- PROVIDENCE LN
- HEB DRIVEWAY (WEST END OF PROPERTY)
- FM 1460 (A.W. GRIMES)

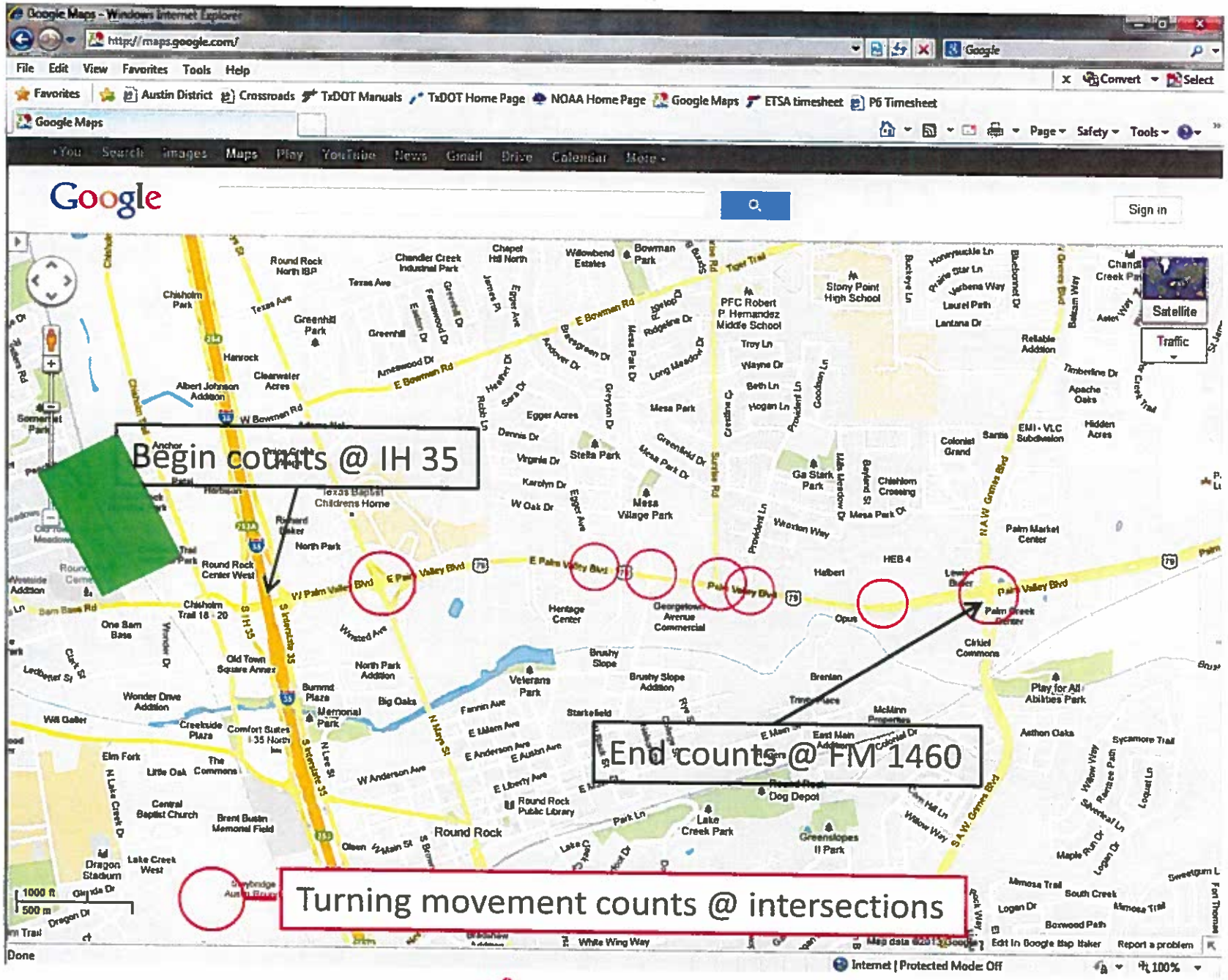
PP

☐ 2. Vehicle classification for environmental studies (Air and Noise Analysis).

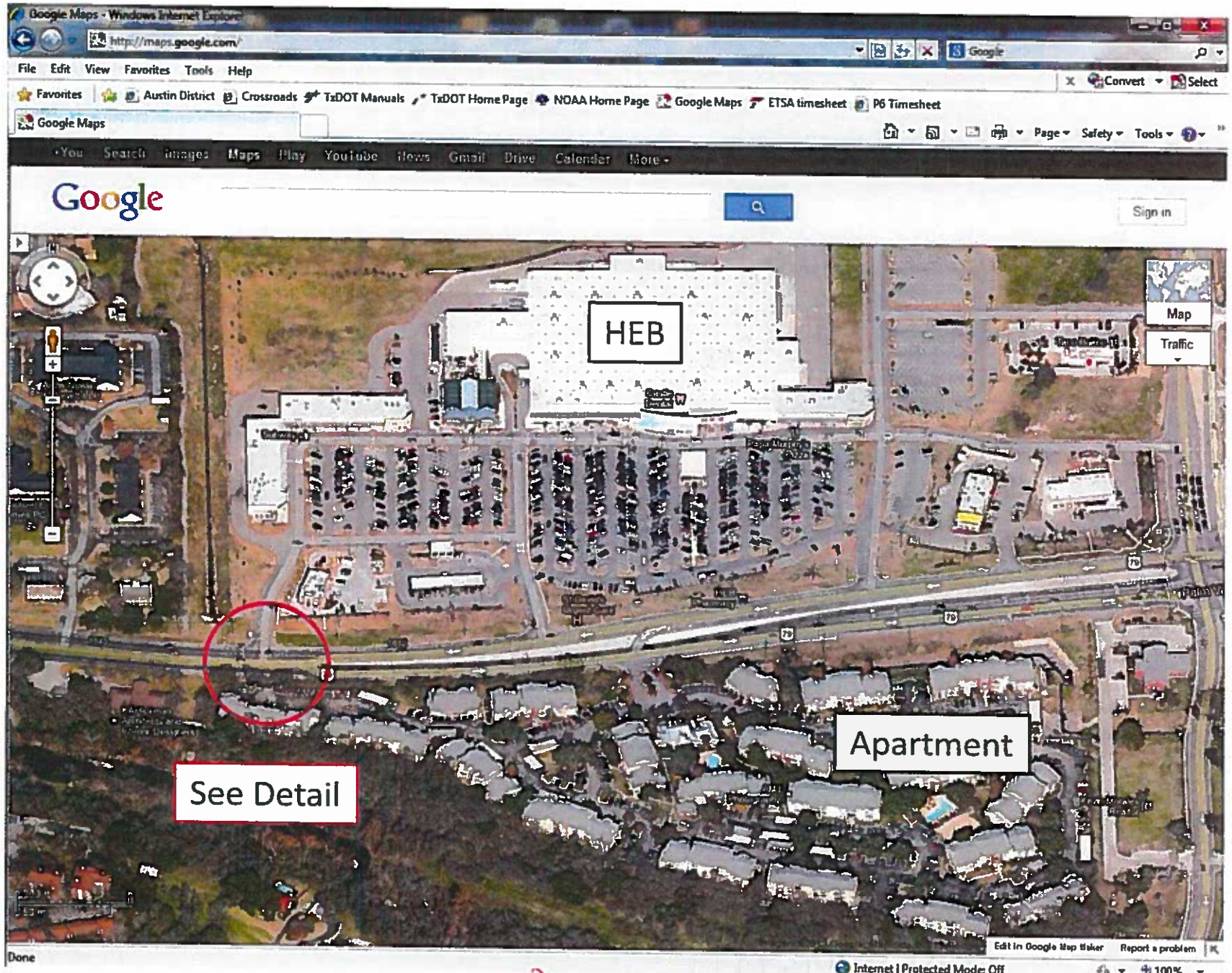
☐ 3. Line diagram analysis (straight line turning movements; please provide line diagram).

☐ 4. Complete Corridor Analysis (includes basic highway traffic data for pavement design, environmental studies and detailed schematic turning movements; *please provide detailed schematic*).

Note: If complete corridor analysis is requested, please attach a traffic schematic diagram.


Google Maps - Windows Internet Explorer
http://maps.google.com/
File Edit View Favorites Tools Help
Favorites Austin District Crossroads TxDOT Manuals TxDOT Home Page NOAA Home Page Google Maps ETSA timesheet P6 Timesheet
Google Maps
Google
Sign in
Satellite
Traffic
Begin counts @ IH 35
End counts @ FM 1460
Turning movement counts @ intersections
Round Rock
Done
Internet | Protected Mode: Off
100%

PP


Google Maps - Windows Internet Explorer
http://maps.google.com/
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Favorites
Austin District
Crossroads
TxDOT Manuals
TxDOT Home Page
NOAA Home Page
Google Maps
ETSA timesheet
P6 Timesheet
Google Maps
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Traffic
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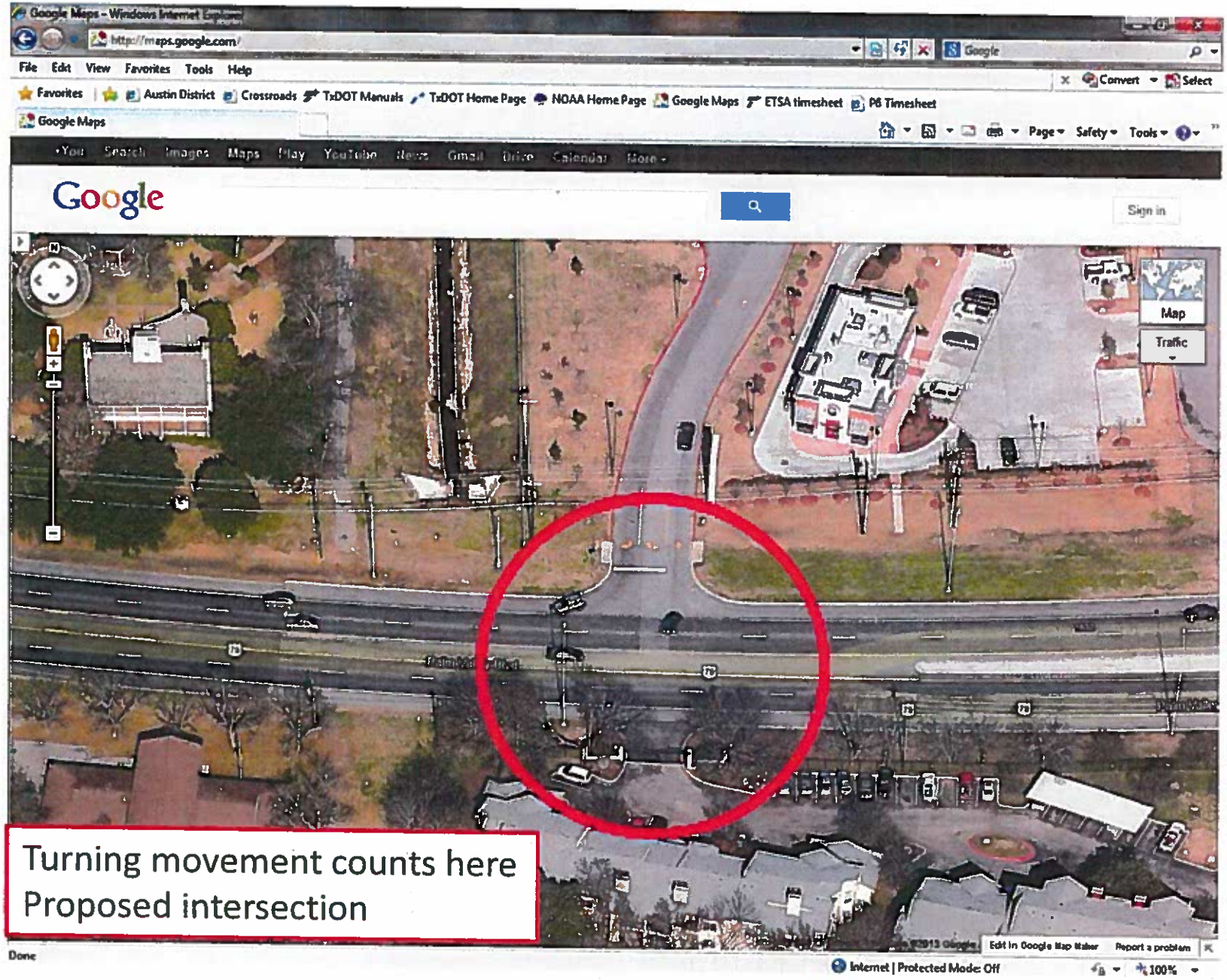
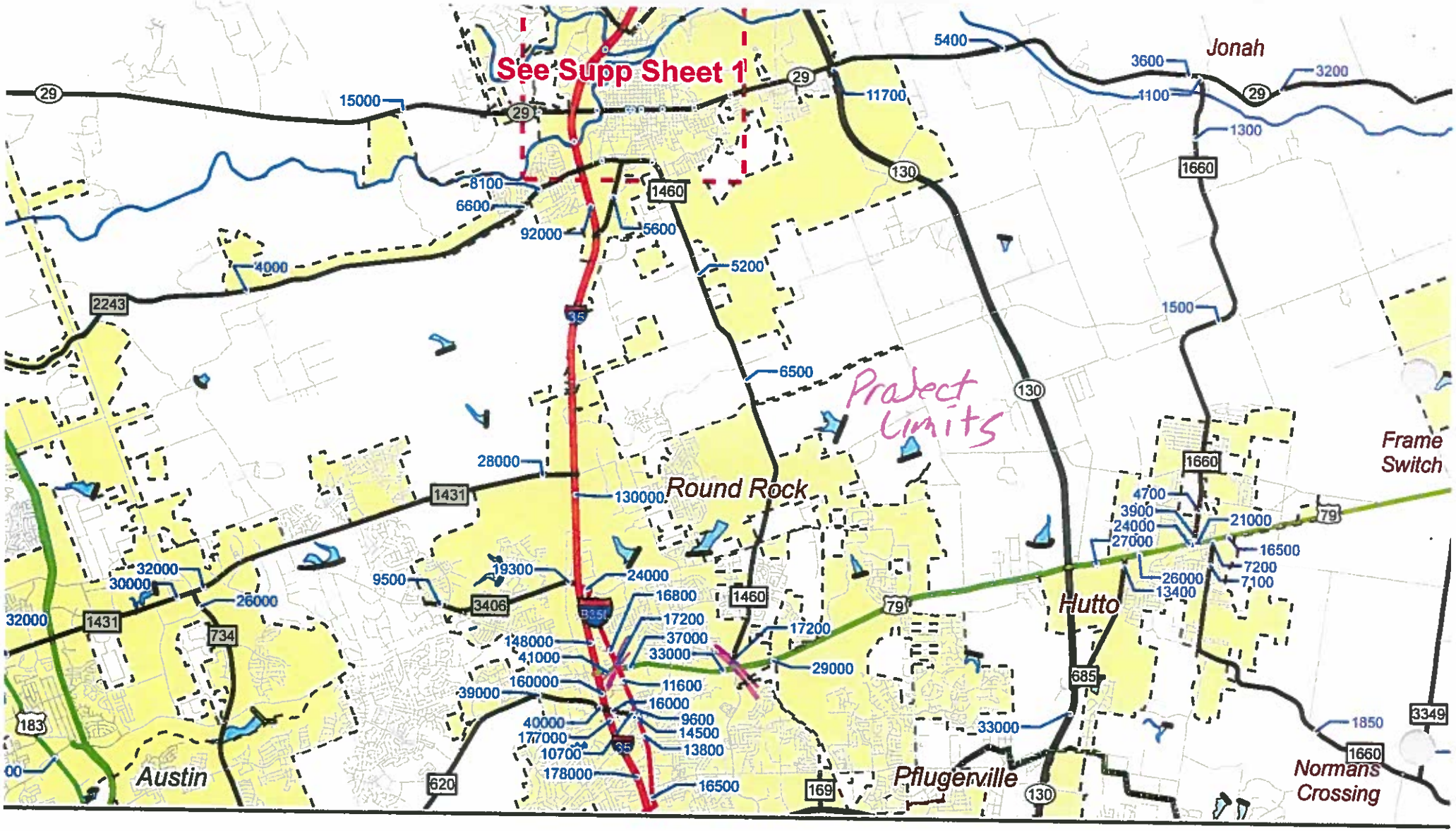
PP


Google Maps - Windows Internet Explorer
http://maps.google.com/
File Edit View Favorites Tools Help
Favorites
Austin District
Crossroads
TxDOT Manuals
TxDOT Home Page
NOAA Home Page
Google Maps
ETSA timesheet
P6 Timesheet
Google Maps
Google
Sign in
Map
Traffic
Edit in Google Map Maker
Report a problem
Done
Internet | Protected Mode: Off
100%
Turning movement counts here
Proposed intersection



2011 AUSTIN DISTRICT TRAFFIC MAP

PREPARED BY THE

Texas Department of Transportation

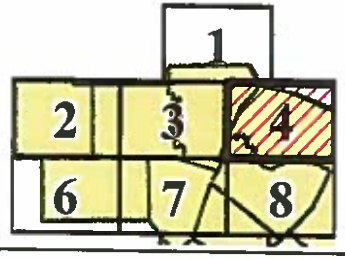
Transportation Planning and Programming Division

IN COOPERATION WITH THE

U.S. Department of Transportation

3 4

N



2.

Corridor Analysis Worksheet: 1 Section, 2 Forecast Years, Air & Noise

Project	US 79	Date for Memorandum	3/25/2013
Rd Type	US	District	Austin
		County	Williamson
Project Limits	From I-35	CSJ	0204-01-06
	To FM 1460	Analyst	RCW

Date:	Request	3/25/2013	Received	3/27/2013	Started	4/22/2013	Completed 4/23/2013
District Contact					Phone #	832-7284	

	Year	ADT's		% Trks ADT	% Trks DHV
Count	2011	41000		14.9	8.9
Base	2013	44000	# Trks	6556	
Forecast	2033	72200			
Forecast	2043	80400			

SPR Station	S-10	MC Stn	M-939	% Trks	25.5
Year	2011	Dir	6	Num Trks	1929
Peak Hour	18.6	Year	2011	Axle Factor	2.74
DD	53	ADT	7572	% Single Axles	0.50
100-DD	47				
K-Factor	12.8				

Main Road Growth Rate	3.6	TDM Assignment	N/A
Growth Rate after 20 Years	2.0		
20 Year Growth Factor	3.205		
30 Year Growth Factor	2.758	LOD	99999
Design Period 1	20		
Design Period 2	30		

				# Lanes	
Structural Number (SN)	3			Existing	5
Slab Thickness (ST)	8			Proposed	7

PP

Past Projects	
Project	US 79
From	FM 1460
To	I-35
Date	11/5/2007
County	Williamson
CSJ	0683-01-078

T. Log			
ADT			
% Growth Rate			
K-Factor			
DD			
% Trucks ADT			
% Trucks DHV			
MC Station			
SPR Station			

Items Done on This Project			
Straight Line Turning Movements	Yes	Detailed Schematic Turning Movements	No
Traffic Analysis for Highway Design	Yes	Field Trip	No
Vehicle Mix	Yes	Travel Demand Model Used	No
Manual Count Worksheet	Yes		

NOTES:

See attachments for t-log

DATA CALCULATIONS FOR US[illegible]N AIR & NOISE ANALYSIS

◉ FHWA Format

Light Duty Vehicles	Motorcycles	17
	Passenger	3419
	Pickup or Van	2207
Single Units	Buses	35
	Other 2 Axle	431
	3 Axles	69
	4 Axles or more	0
Truck Combs.	3-4 Axles	129
	5 Axles	1232
	6 Axles or more	19
Semi-Trailer-Trailer	5 Axles or less	11
	6 Axles	2
	7 Axles or more	1

○ Texas 6 Format

Light Duty Vehicles	Passenger	
	Panel & Pickup	
Single Units	Buses	
	Other 2 Axle	
	3 Axle	
	4 Axle or More	
Truck Combs.	3 Axle	
	4 Axle	
	5 Axle	
	6 Axle or more	
Semi-Trailer-Trailer	5 Axle	
	6 Axle	
	7 Axle or more	

FHWA Format Data

	Number	%
Light	5643	74.5
Medium	530	7.0
Heavy	1399	18.5
Trucks	1929	25.5

SECTION 1

US

	ADT	DHV
Light	85.1	91.1
Medium	4.1	2.5
Heavy	10.8	6.4

Total Vehicles	7572
Total Trucks	1929
Total Singles	2640.5
Total Tandems	2639.5
AXLE FACTOR	2.74
SINGLE AX FACT	0.50

INPUT DATA FOR KIPS: AUTOMATIC

SN, ST	3, 8					
Design Periods	1	2				
Year 1	13	13				
Year 2	33	43				
ADT	44000	44000				
% Trks	14.9	14.9				
Growth Rate	3.205	2.758				
Years	20	30				
Facil Type	B	B				
S.N.	3	3				
SLAB	8	8				
Weight Sta	99999	99999				
Axle Factor	2.74	2.74				
Single Axle	0.50	0.50				

PP

OUTPUT DATA FROM KIPS: ENTER FOR TAHD FORM

SN, ST	3, 8					
Design Periods	1	2				
ATHWLD	12900	13000				
% T in ATHWLD	40	40				
FLEXIBLE	30473000	48936000				
RIGID	42692000	68558000				

TRAFFIC VOLUME REGRESSION WORKSHEET

April 22, 2013

PROJECT: US 79 From I-35 to FM 1460
LIMITS:

District: Austin
County: Williamson
CSJ: 0204-01-06

ROUTE					US 79	US 79	US 79					
LOCATION					A	B	C					
1991					29000	19100	10500					
1992					24000	17200	12000					
1993					26000	18100	12900					
1994					32000	19100	13900					
1995					28000	25000	18200					
1996					30000	27000	19900					
1997					30000	28000	19700					
1998					35000	32000	23000					
1999					28000	30000	23000					
2000					39000	35000	25000					
2001					40000	36000	28000					
2002					42000	35000	31000					
2003					42000	37000	32000					
2004					50000	41000	37000					
2005					46110	40250	36790					
2006					41000	45000	41000					
2007					48000	41000	41000					
2008					47000	39000	37000					
2009					46000	41000	36000					
2010					46000	40000	36000					
2011					41000	37000	33000					
	Regr01	Regr02	Regr03	Regr04	Regr05	Regr06	Regr07	Regr08	Regr09	Regr10	Regr11	Regr12
Low Linear Annual Growth Rate					1.4%	1.7%	2.1%					
Forecast Lnr. An. Grwth Rate	☐	☐	☐	☐	**2.4%** ☐	**2.8%** ☐	**3.6%** ☐	☐	☐	☐	☐	☐
High Linear Annual Growth Rate					3.4%	4.0%	5.0%					
Estimated Standard Deviation					3978.09	3581.02	3553.82					
B (Slope)					1167	1278	1512					
A (Intercept)					25956	19750	11876					
R^2					0.876	0.911	0.935					
Confidence Interval					+/-90% CI 60	+/-90% CI 54	+/-90% CI 60					
	Avg. of selected Forecast Linear Annual Growth Rates:						**Avg. of all** Forecast Linear Annual Growth Rates:				**2.9%**	
GR's for Non-Regression vols only												

PROJECTIONS OF ABOVE TRAFFIC VOLUME DATA TO FORECASTED YEARS

Use last Count Year from above. ☑

Do not use last Count Year from above. ☐
Enter any one of previous count years from above. 2010

Enter Base Year 2012

Pivot Growth Rate at 20 Years from Count Year (most commonly used). ☑

Pivot Growth Rate (GR) at other than 20 Years from Count Year. ☐
Enter years from Count Year for pivoting Growth Rate (e.g. for pivoting growth ten years from Count Year, enter 10) 10

Enter Model Year 2030

Enter Earliest Variable Year 2015
Enter Latest Variable Year 2025

Optional Input: SPB Station, Yr
Optional Input: K-Factor
Optional Input: Dir. Dist.

Pre-20/Pivot Yr Growth Rates Selection

Use Relative Low & Non-Regression GR's	○	
Use Relative Frcst & Non-Regression GR's	○	
Use Relative High & Non-Regression GR's	○	
Use Avg. of Selected Low Growth Rates	○	
Use Avg. of Selected Forecast Growth Rates	◉	
Use Avg. of Selected High Growth Rates	○	
Use Avg. of All Low Growth Rates	○	1.7%
Use Avg. of All Forecast Growth Rates	○	2.9%
Use Avg. of All High Growth Rates	○	4.1%
Use Highest Forecast Growth Rate	○	3.6%
Use Lowest Forecast Growth Rate	○	2.4%
Use Manually Selected Growth Rate	○	4.0%

Post-20/Pivot Year Growth Rate Note: If Pre-20/Pivot Yr GR is 2.0% or less, that rate is used in the projections, not the rate below.
Enter Growth Rate (2.0% most common) 2.0%

ROUTE					US 79	US 79	US 79					
LOCATION					A	B	C					
20/PIVOT YR AN. GROWTH RATE												
Count Year - 2011					41000	37000	33000					
Base Year - 2012												
Ten Year Forecast - 2022												
Twenty Year Forecast - 2032												
Thirty Year Forecast - 2042												
Forty Year Forecast - 2052												
GR Pivot Year Forecast - 2031												
Earliest Var Yr Frcst - 2015												
Latest Var Yr Frcst - 2025												
Model Year Forecast - 2030												
Model Traffic Assignment												
Difference of Model Yr Forecast from Model Traffic Assignment Above Difference in DDHV												
% Difference of Model Yr Forecast from Model Traffic Assignment												

Volume, capacity and volume to capacity ratios used to determine US79 future growth rate.
Data taken from CAMPO's 2040 regional Travel Demand Model under shared use agreement.
No sub-area study or model calibration was done.

11-29-17 Conference Call w/ Austin District and Lan-inc.
It was agreed to provide a corridor info. packet
with a 2% growth rate.
-Gabe