U.S. Department of Veterans Affairs

El Paso Veterans Affairs Health Care Center
Final Environmental Assessment

June 2022

Prepared for:
U.S. Department of Veterans Affairs
Office of Construction and Facilities Management

Prepared by:
LRS Federal LLC

Executive Summary

This environmental assessment (EA) has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 United States Code 4321 et seq.), the President's Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and Environmental Effects of the Department of Veterans Affairs Actions (38 CFR Part 26). This EA is required to determine if the Department of Veterans Affairs' (VA's) proposed action would have significant environmental impacts. Federal agencies are required to consider the environmental and related social and economic effects of their proposed actions. This EA has been prepared in accordance with relevant guidance from VA's NEPA Interim Guidance for Projects dated September 2010 and supplemental guidance thereto.

Purpose and Need

The purpose of the proposed action is to enhance and expand services to current and future Veterans in the El Paso, Texas area by providing an integrated, right-sized, and energy-efficient VA Health Care Center (HCC). The proposed HCC would be designed to focus on specialty care, to expand ambulatory surgery functions, and to provide virtual health care to Veterans.

The proposed action is needed to address current and future projected health care needs, expand capacity, reduce service gaps, and enhance VA health care services. The center would augment the services at existing VA health care centers and clinics to meet the current and rapidly growing health care needs of Veterans in the El Paso area.

Proposed Action

VA's proposed action is the construction and operation of an approximately 500,000 building gross square feet (BGSF) health care center on a 30-acre site adjacent to the new William Beaumont Army Medical Center (WBAMC) on Fort Bliss in El Paso, Texas. The site would include approximately 1,500 - 2,000 surface parking spaces, a central utilities plant, sanitary and potable water connections and other site improvements including landscaped areas and new stormwater retention facilities. No demolition would be required since the site is currently undeveloped.

The site layout has not yet been fully defined, nor have the buildings and structures been designed. Therefore, for purposes of this EA, it is assumed that the entire site acreage would be disturbed in the process of constructing the HCC and that the HCC with associated improvements, infrastructure, utilities, and landscaping would occupy the entire 30-acre site.

The final design would likely include multiple low-rise buildings with no more than seven floors. The configuration of the site would take into consideration parking, roadways, stormwater retention, future expansion, and building physical security requirements. Electrical lines, as well as water, sewer, and gas pipelines, would be constructed to serve the new facilities. Design and construction of the VA HCC is anticipated to begin in 2023 with an anticipated construction completion date in 2027.

The HCC would be used Monday through Friday except on federal holidays and would be available to Veterans and service members from all branches of the U.S. Armed Forces who meet the criteria for treatment.

Alternatives

Under the no action alternative, the proposed action would not be implemented. VA would continue to provide services at existing, under-sized VA facilities, health care centers, and clinics. The proposed site would not be used by VA and could possibly be used by Fort Bliss for other purposes. This alternative would limit VA's ability to provide needed health care services to Veterans in the region. The alternative does not meet the purpose and need. However, analysis of the no action alternative is required by CEQ

regulations and provides a benchmark for comparing and analyzing the potential effects of the other alternatives.

Affected Environment and Environmental Consequences

The EA describes the baseline physical, environmental, cultural, and socioeconomic conditions at the alternative project sites and the general vicinity, with emphasis on those resources potentially impacted by the alternatives. Potential impacts on physical, environmental, cultural, and socioeconomic conditions are analyzed for each alternative. Resource areas considered in this EA are aesthetics; air quality; cultural and historic resources; geology and soils; hydrology and water quality; wildlife and habitat; noise; land use; floodplains, wetlands, and coastal zone management; socioeconomics; community services; solid waste and hazardous materials; traffic, transportation, and parking; utilities; and environmental justice. Table ES-1 summarizes the findings of the impact analysis.

Table ES-1. Summary of Impact Analysis

Resource Area	Proposed Action	No Action Alternative
Aesthetics	Aesthetic impacts associated with construction activities would be temporary and less than significant. The design of the Veterans Affairs (VA) Health Care Center (HCC) would be consistent with surrounding development and would not detract from the aesthetics of the area. Aesthetic impacts would be less than significant.	None
Air Quality	Construction activities would have short-term minor impacts related to emissions and fugitive dust. Operation emissions would be less than significant. The only sensitive air quality receptor in the area is the William Beaumont Army Medical Center (WBAMC). Best management practices (BMPs) would be followed, and applicable permit requirements would be met. Air quality impacts would be less than significant.	None
Cultural and Historic Resources	No historic properties were identified within the area of potential effects (APE); therefore, no historic properties would be affected by the project. Cultural and historic resources impacts would be less than significant.	None
Geology and Soils	Ground disturbances would be stabilized during construction activities and permit requirements would be met. BMPs to limit impacts to the soil at the site would be implemented. Geology and soil impacts would be less than significant.	None
Hydrology and Water Quality	BMPs would be implemented to control stormwater at the site during construction and	None

	operation, and all applicable permit requirements would be met. Hydrology and water quality impacts would be less than significant.	
Wildlife and Habitat	BMPs would be implemented to ensure wildlife does not enter the site during construction. Biological monitoring for the Texas Horned Lizard would be implemented during construction and a workforce protected species awareness training would be given in advance. Disturbed areas would be revegetated after construction is complete. Wildlife and habitat impacts would be less than significant.	None
Noise	Construction-related noise would be localized to traffic along the main roads. The only sensitive noise receptor in the area is the WBAMC. Ongoing operational noise would be minimal and primarily related to vehicular traffic. Noise impacts would be less than significant.	None
Land Use	The VA HCC site would remain compatible with surrounding commercial land uses. Land use impacts would be less than significant.	None
Floodplains, Wetlands, and Coastal Management	None	None
Socioeconomics	There would be employment-related, beneficial impacts as a result of the proposed VA HCC. The facility would also enhance health care for Veterans in the region. Socioeconomic impacts to would be less than significant.	None
Community Services	Construction activities at the proposed site are not expected to place additional substantial demands on police, fire, emergency services, or other community services. Community service impacts would be less than significant.	None
Solid Waste and Hazardous Materials	During construction, the presence and use of petroleum and hazardous substances could increase the potential for accidental release or spill; however, BMPs would be implemented to avoid any impacts from hazardous waste. Solid waste, including medical and biohazardous waste generated at the VA HCC,	None

	would be managed in accordance with applicable laws and regulations. Solid waste and hazardous material impacts would be less than significant.	
Traffic, Transportation, and Parking	Traffic conditions are not anticipated to be significantly impacted by the facility. Parking would be sufficient to meet the employee and visitor demand of the new VA HCC. Traffic, transportation, and parking impacts would be less than significant.	None
Utilities	Electric, natural gas, water, and sewer utilities would need to be incorporated into the design of the site. Utilities in the area have the capacity to meet the VA HCC's projected demand. Utility impacts would be less than significant.	None
Environmental Justice	There would be no disproportionate impacts to minority or low-income populations. Environmental justice impacts would be less than significant.	None

Agency Coordination and Public Participation

VA published a notice of scoping on July 4, 2021 and July 7, 2021 in the El Paso Times newspaper. The notice described the proposed action and solicited public comments with a deadline of August 3, 2021. VA also emailed scoping letters to federal, state, and local agencies; public officials; federally recognized Tribes; and special interest groups. Similar to the notices published in the newspaper, the letters included information on the proposed action, the comment period, and instructions on submitting comments. During the public scoping period, VA received three written comments (refer to Appendix B).

VA published and distributed the Draft EA for a 30-day public comment period as announced by a Notice of Availability which was published in the El Paso Times newspaper on Friday June 10, 2022, and Sunday June 12, 2022. Copies of the Draft EA were made available online at https://www.cfm.va.gov/environmental/index.asp and behind the reference desk at the Esperanza Acosta Moreno Library in El Paso, Texas. VA received one letter of concurrence from the White Mountain Apache Tribe that the proposed action would have no adverse effects to the tribe's cultural heritage resources and historical properties and one letter from Texas Parks and Wildlife Division (TPWD) with comments on the Draft EA. TPWD's comments have been addressed in this Final EA.

After surveying efforts conducted by the VA for proposed utility corridors, the Texas Historical Commission concurred that construction and operation of the HCC would not affect any properties or archaeological sites eligible for listing in the National Register of Historic Places (Appendix B).

The VA also requested early coordination with the TPWD and received recommendations to assist in project planning and compliance with state and federal laws, which have been included in this Final EA. VA's correspondence with TPWD is included in Appendix B.

Table of Contents

1.0 Introduction 1
1.1 Background 1
1.2 Purpose and Need 1
2.0 Alternatives 3
2.1 Proposed Action 3
2.2 No Action Alternative 3
2.3 Alternatives Eliminated from Further Consideration 5
3.0 Affected Environment and Environmental Consequences 6
3.1 Aesthetics 7
3.1.1 Affected Environment 7
3.1.2 Environmental Consequences 7
3.1.2.1 Proposed Action 7
3.1.2.2 No Action Alternative 7
3.2 Air Quality 8
3.2.1 Affected Environment 8
3.2.2 Environmental Consequences 8
3.2.2.1 Proposed Action 8
3.2.2.2 No Action Alternative 9
3.3 Cultural and Historic Resources 9
3.3.1 Affected Environment 9
3.3.2 Environmental Consequences 9
3.3.2.1 Proposed Action 9
3.3.2.2 No Action Alternative 13
3.4 Geology and Soils 13
3.4.1 Affected Environment 13
3.4.2 Environmental Consequences 13
3.4.2.1 Proposed Action 13
3.4.2.2 No Action Alternative 13
3.5 Hydrology and Water Quality 13
3.5.1 Affected Environment 13
3.5.2 Environmental Consequences 14
3.5.2.1 Proposed Action 14
3.5.2.2 No Action Alternative 14
3.6 Wildlife and Habitat 14
3.6.1 Affected Environment 14
3.6.2 Environmental Consequences 16
3.6.2.1 Proposed Action 16
3.6.2.2 No Action Alternative 17
3.7 Noise 17
3.7.1 Affected Environment 17
3.7.2 Environmental Consequences 18
3.7.2.1 Proposed Action 18
3.7.2.2 No Action Alternative 18
3.8 Land Use 18
3.8.1 Affected Environment 18

3.8.2 Environmental Consequences 18
3.8.2.1 Proposed Action 18
3.8.2.2 No Action Alternative 19
3.9 Socioeconomics 19
3.9.1 Affected Environment 19
3.9.2 Environmental Consequences 20
3.9.2.1 Proposed Action 20
3.9.2.2 No Action Alternative 20
3.10 Community Services 20
3.10.1 Affected Environment 20
3.10.2 Environmental Consequences 20
3.10.2.1 Proposed Action 20
3.10.2.2 No Action Alternative 21
3.11 Solid Waste and Hazardous Materials 21
3.11.1 Affected Environment 21
3.11.2 Environmental Consequences 21
3.11.2.1 Proposed Action 21
3.11.2.2 No Action Alternative 22
3.12 Traffic, Transportation, and Parking 22
3.12.1 Affected Environment 22
3.12.2 Environmental Consequences 23
3.12.2.1 Proposed Action 23
3.12.2.2 No Action Alternative 25
3.13 Utilities 25
3.13.1 Affected Environment 25
3.13.2 Environmental Consequences 25
3.13.2.1 Proposed Action 25
3.13.2.2 No Action Alternative 27
3.14 Environmental Justice 27
3.14.1 Affected Environment 27
3.14.2 Environmental Consequences 27
3.14.2.1 Proposed Action 27
3.14.2.2 No Action Alternative 27
3.15 Cumulative Impacts 27
3.16 Potential for Generating Substantial Controversy 29
4.0 Mitigation and Protection Measures 30
5.0 Public Participation 34
5.1 Agency Coordination 34
5.2 Native American Consultation 34
5.3 Scoping 34
5.4 Public Review 34
6.0 Agencies and Persons Consulted 36
7.0 List of Preparers 41
7.1 Department of Veterans Affairs Staff 41
7.2 LRS Federal (Consultants) 41
8.0 References 42
9.0 Glossary 44

A Appendix A: Permits
B Appendix B: Agency Correspondence
C Appendix C: Traffic Study
D Appendix D: Water Capacity and Consumption Analysis Report

List of Tables

Table 3-1. Summary of Resource Areas Not Analyzed in Further Detail 6
Table 3-2. Federally and State Listed Protected Species 15
Table 3-3. Population and Veteran Status 19
Table 3-4. Income, Poverty, and Employment 19
Table 3-5. Level of Service Descriptions 23
Table 3-6. Existing Level of Service at Major Intersections 23
Table 3-7. Full Build-out 2027 Level of Service at Major Intersections 24
Table 3-8. Peak Hour Trip Generation 24
Table 3-9. Summary of Environmental Justice Data 27
Table 4-1. Best Management Practices for the Proposed Action 30
Table 4-2. Regulatory Requirements for the Proposed Action 33

List of Figures

Figure 1-1. Existing and Proposed VA Health Care Facilities 2
Figure 2-1. Aerial View of the Proposed Action 4
Figure 3-1. Area of Potential Effects Including Utility Connections 12

Acronyms and Abbreviations

amsl	above mean sea level
APE	area of potential effects
ASTs	aboveground storage tanks
BCT	Brigade Combat Teams
BGSF	building gross square feet
BMPs	best management practices
CEQ	Council on Environmental Quality
CFH	cubic feet per hour
CFR	Code of Federal Regulations
CO_2e	carbon dioxide equivalent
DoD	Department of Defense
DPW	Department of Public Works
EA	environmental assessment
EJ	environmental justice
EPEC	El Paso Electric Company
EPNG	El Paso Natural Gas Company
EPWU	El Paso Water Utility
ESCP	Erosion and Sediment Control Plan
FBWSC	Fort Bliss Water Services Company
FEMA	Federal Emergency Management Agency
GHG	greenhouse gases
HCC	health care center
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Consultation
IPT	Industrial Pretreatment
LOS	level of service
MT	metric tons
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places

PA	Proposed Action
RCRA	Resource Conservation and Recovery Act
RPMP	Real Property Master Plan
SPCCP	Spill Prevention Control & Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
TPWD	Texas Parks and Wildlife Department
TXDOT	Texas Department of Transportation
USEPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USTs	underground storage tanks
VA	U.S. Department of Veterans Affairs
VAMC	Veterans Affairs Medical Center
WBAMC	William Beaumont Army Medical Center

1.0 Introduction

This environmental assessment (EA) has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 United States Code 4321 et seq.), the President's Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and Environmental Effects of the Department of Veterans Affairs Actions (38 CFR Part 26). This EA is required to determine if the Department of Veterans Affairs' (VA's) proposed action would have significant environmental impacts. Federal agencies are required to consider the environmental and related social and economic effects of their proposed actions. This EA has been prepared in accordance with relevant guidance from VA's NEPA Interim Guidance for Projects dated September 2010 and supplemental guidance thereto.

This EA identifies, analyzes, and documents the potential physical, environmental, cultural, and socioeconomic impacts associated with VA's proposed construction and operation of an approximately 500,000 building gross square foot (BGSF) health care center with approximately 1,500-2,000 surface parking spaces, a central utility plant, underground and overhead utility distribution, walkways, roadways, landscaping, site lighting, and other associated necessary improvements. The proposed 30-acre site sits adjacent to the new William Beaumont Army Medical Center (WBAMC) on Fort Bliss in El Paso, Texas. The health care center would employ an estimated 987 staff.

In accordance with the cited regulations, this EA allows for public input into the federal decision-making process, provides federal decision-makers with an understanding of potential environmental effects of their decisions before making these decisions, identifies the measures the federal decision-maker could implement to reduce potential environmental effects, and documents the NEPA process.

1.1 Background

Currently, VA provides health care services to Veterans at four VA clinics in El Paso and the El Paso VA Medical Center (VAMC). The current space in these facilities is insufficient to meet the future needs of Veterans in the El Paso area. VA estimates that by 2025 there will be 65,500 Veterans in El Paso (Texas) and Dona Ana (New Mexico) counties (U.S. Department of Veterans Affairs, 2021). An increasing Veteran's population coupled with existing facility patient workload capacities inhibit Veterans from timely access to high-quality health care services.

1.2 Purpose and Need

The purpose of the proposed action is to enhance and expand services for future Veterans in the El Paso, Texas area by providing an integrated, right-sized, and energy-efficient VA Health Care Center (HCC). The proposed HCC would be designed to focus on specialty care, to expand ambulatory surgery functions, and to provide virtual health care to Veterans.

The proposed action is needed to address future projected health care needs, expand capacity, reduce service gaps, and enhance VA health care services. The center would augment the services provided at existing VA facilities, health care centers, and clinics and position the VA to meet the growing health care needs of Veterans in the El Paso area. VA will provide timely access to state-of-the-art health care, enhance specialty care services, and provide ambulatory surgery functions to Veterans in the El Paso area.

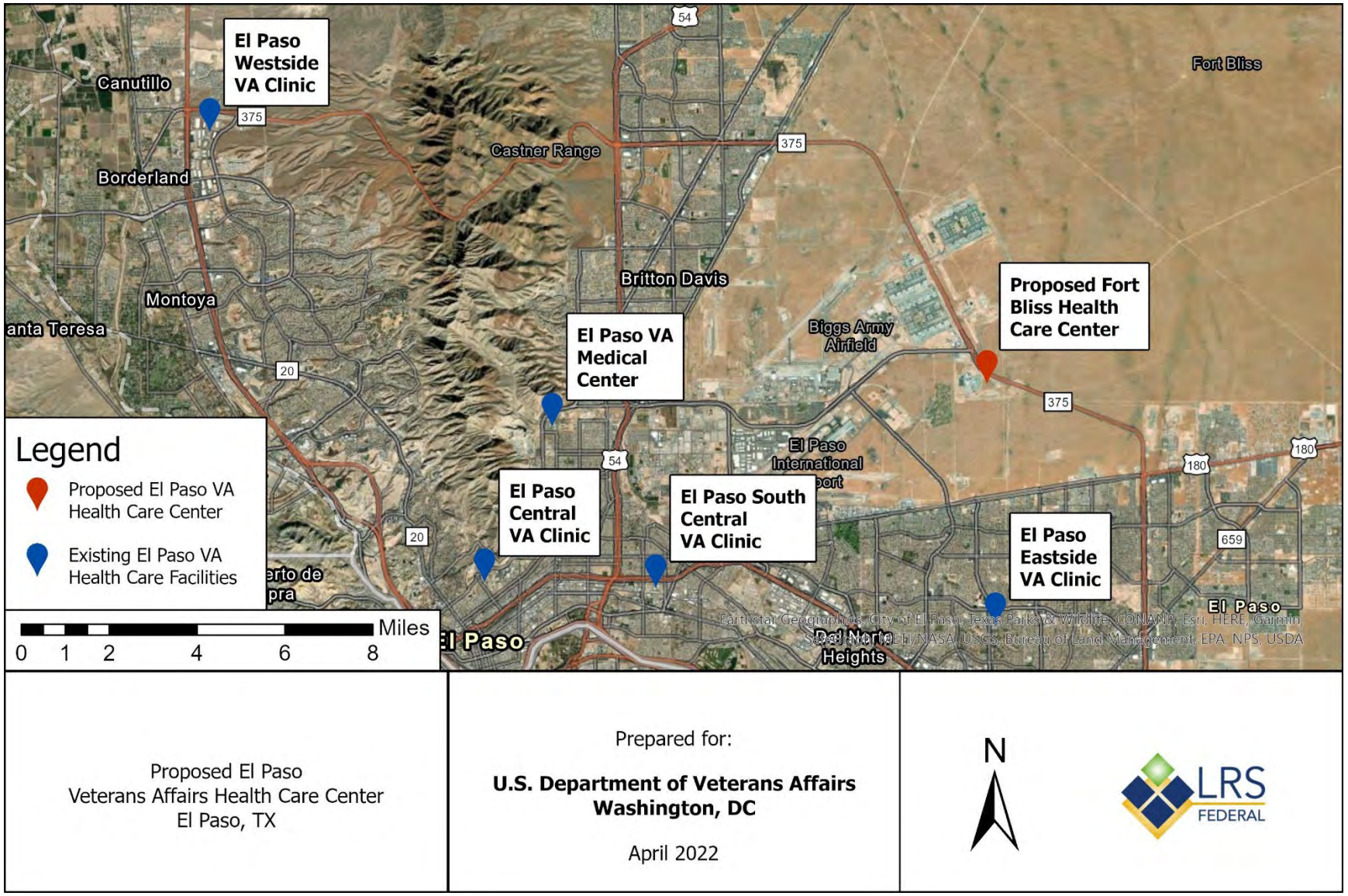


Figure 1-1. Existing and Proposed VA Health Care Facilities

2.0 Alternatives

This section describes the proposed action and alternatives considered by VA, including those alternatives eliminated from further analysis. NEPA and VA regulations for implementing NEPA require all reasonable alternatives to be rigorously explored and objectively evaluated. The criteria and process applied by VA to narrow the number of viable sites is described.

2.1 Proposed Action

VA's proposed action is the construction and operation of an approximately 500,000 BGSF health care center on a 30-acre site adjacent to the new WBAMC on Fort Bliss in El Paso, Texas. The site would include approximately 1,500 - 2,000 surface parking spaces, a central utility plant, sanitary and potable water connections and other site improvements including landscaped areas and new stormwater retention facilities. No demolition would be required since the site is currently undeveloped.

The site layout has not yet been defined, nor have the buildings and structures been designed. Therefore, for purposes of this EA, it is assumed that the entire site acreage would be disturbed in the process of constructing the HCC and that the HCC with associated improvements, infrastructure, utilities, and landscaping would occupy the entire 30-acre site.

The final design would likely include multiple low-rise buildings with no more than seven floors. The configuration of the site would take into consideration parking, roadways, stormwater retention, future expansion, and building physical security requirements. Electrical lines, as well as water, sewer, and gas pipelines, would be constructed to serve the new facilities. Design and construction of the VA HCC is anticipated to begin in 2023 with anticipated completion in 2027.

The HCC would be used Monday through Friday except on federal holidays and would be available to Veterans and service members from all branches of the U.S. Armed Forces who meet the criteria for treatment.

2.2 No Action Alternative

Under the no action alternative, the proposed action would not be implemented. VA would continue to provide services at existing, under-sized VA facilities, health care centers, and clinics. The proposed site would not be used by VA and could possibly be used by Fort Bliss for other purposes. This alternative would limit VA's ability to provide needed health care services to Veterans in the region. The no action alternative does not meet the purpose and need. However, analysis of the no action alternative is required by CEQ regulations and provides a benchmark for comparing and analyzing the potential effects of the other alternatives.

Figure 2-1. Aerial View of the Proposed Action

2.3 Alternatives Eliminated from Further Consideration

VA eliminated other alternatives for meeting the purpose and need. These alternatives were not viable or failed to meet the purpose and need for the proposed action. After identifying deficiencies of the existing VA facilities in the El Paso area, VA examined alternatives. These alternatives included the following:

- VA considered renovating a vacant or underutilized VA-owned facility. However, local VA planners determined no existing VA-owned facilities are suitable for renovation and fit the project requirements.
- VA considered contracting out primary care, mental health, and specialty care services to private health care providers. However, this alternative is not cost-effective and could result in the loss of quality and control over Veteran health care. Additionally, there may not be sufficient, qualified private health care providers in the area to accommodate current and projected Veteran populations.
- VA considered purchasing an existing facility in the local community that is suitable for renovation and able to accommodate project requirements. However, a permanent VA-owned facility would limit flexibility to relocate services in the future based on changes in Veteran demographics. Market research and interviews with local VA planners indicated that a suitable facility for purchase and subsequent renovation does not exist in the delineated market area of the proposed HCC.
- VA considered leasing a new shared facility with the Department of Defense (DoD) as a sub-lease. This alternative would address space and utilization gaps and departmental initiatives. However, local VA planners and Veterans Health Administration's Office of VA-DoD Coordination professionals determined there are no existing facility-sharing opportunities in the vicinity of the proposed HCC.

For the reasons stated above, these alternatives were eliminated from further consideration.

3.0 Affected Environment and Environmental Consequences

This section describes the baseline physical, environmental, cultural, and socioeconomic conditions at the proposed project site and the general vicinity, with emphasis on those resources potentially impacted.

CEQ guidelines and regulations encourage agencies to streamline environmental analyses in their EAs (CEQ, 2012) by focusing on significant issues and discussing insignificant issues only briefly, discussing impacts in proportion to their significance, and incorporating by reference other environmental analyses (40 CFR 1500.4(c), 1502.2(b), and 1502.21).

Under each resource area, the potential direct and indirect effects of implementing the proposed action and the no action alternative are identified. Potential cumulative impacts are discussed in Section 3.15 Cumulative Impacts. Impacts are identified as either significant or less than significant. The terms "effects" and "impacts" are synonymous in this EA. Where possible, impacts are identified as short-term, temporary, or long-term in relation to the length of the effect of the impact. Unless otherwise noted, short-term/temporary impacts are those that would result from activities associated with a project's construction. Long-term/permanent impacts are generally those resulting from operation of the proposed facility or activity.

The CEQ regulations specify that in determining the significance of effects, consideration must be given to both "context" and "intensity" (40 CFR 1508.27). Context refers to the significance of an effect to society as a whole (human and national), to an affected region, to affected interests, or to just the locality. Significance varies with the setting of the proposed action. Intensity refers to the magnitude or severity of the effect and whether it is beneficial or adverse. In this EA, the significance of potential direct, indirect, and cumulative effects has been determined through a systematic evaluation of each considered alternative in terms of its effects on each individual environmental resource component.

Prior to construction, VA would obtain all applicable, required federal, state, and local permits for the El Paso HCC project from the appropriate government authorities. As a federal agency conducting a project on land owned by the federal government, VA is not subject to State of Texas or City of El Paso regulations, and permitting requirements not based on federal statutes. However, VA intends to implement the proposed action in a manner generally consistent with applicable state and local regulations, where such regulations are not in conflict with federal law, policy, or VA's mission.

Resource areas considered in this EA are aesthetics; air quality; cultural and historic resources; geology and soils; hydrology and water quality; wildlife and habitat; noise; land use; socioeconomics; community services, solid waste, and hazardous materials; traffic, transportation, and parking; utilities; and environmental justice. VA determined that some resource areas are not warranted for further evaluation in this EA. A summary of these resource areas and the rationale for not analyzing them further are presented in Table 3-1.

Table 3-1. Summary of Resource Areas Not Analyzed in Further Detail

Resource Area	Anticipated Impacts	Rationale for Not Analyzing in Further Detail
Floodplains, Wetlands, and Coastal Zone Management	According to Federal Emergency Management Agency Flood Insurance Rate Map Community-Panel Number 480212 0150 B dated September 4, 1991, the site is located within Zone X, meaning it is in an area of minimal flood hazard and is not located within	The project site is not within a floodplain, wetland, or coastal zone management area; therefore, the resource area does not warrant further analysis.

	the 100-year or 500-year floodplains (FEMA). United States Fish and Wildlife Service National Wetlands Inventory does not show any wetlands present at the site (USFWSb). The Coastal Zone Management Act of 1972 provides the basis for protecting, restoring, and responsibly developing our nation's diverse coastal communities and resources. The site is not located in a coastal zone management area.	

3.1 Aesthetics

3.1.1 Affected Environment

The location proposed for the new El Paso HCC is adjacent to the new WBAMC on Fort Bliss in El Paso, Texas. The site encompasses approximately 30 acres of predominantly flat undeveloped land. The City of El Paso borders along the installation to the south and west. The area is further constrained by the Rio Grande River and the Franklin Mountain Range. The northwest, northern, and eastern installation border joins to the alluvial fans and foothills. Vegetation in the area is sparse and primarily consists of desert grasses and shrubs. In addition to the hospital located adjacent west and northwest of the property, Peralta Road followed by Purple Heart Memorial Highway (Texas State Highway Loop 375) bounds the north and northeastern portions of the site. Adjacent and east are water tanks which service the WBAMC. Iron Medics Drive borders the southern site boundary. Aside from the WBAMC, there is limited development in the immediate vicinity of the site. Approximately 0.5 miles southeast of the property is Butterfield Trail Golf Club followed by the El Paso International Airport.

3.1.2 Environmental Consequences

3.1.2.1 Proposed Action

The proposed action would involve typical construction activities, including site preparation, grading, and movement of heavy equipment, which would temporarily impact local aesthetics. Aesthetic impacts for the surrounding area related to construction activities would be less than significant. Since a new building would be constructed, the proposed action would change the long-term appearance of the site and surrounding area; however, the new HCC building would be aesthetically consistent with surrounding developments, including the adjacent WBAMC. The proposed El Paso HCC and associated landscaping would have less than significant, long-term visual impacts to the surrounding area.

3.1.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to aesthetics would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to aesthetics, specific to plans for potential development or unrelated land development projects.

3.2 Air Quality

3.2.1 Affected Environment

Ambient air quality in an area is characterized by compliance with the primary and secondary National Ambient Air Quality Standards (NAAQS). The United States Environmental Protection Agency (USEPA) sets standards for pollutants considered harmful to public health and the environment. Areas are then classified as attainment, non-attainment, or maintenance with respect to compliance with NAAQS. The USEPA Green Book provides information about the area's NAAQS designations and non-attainment status. According to USEPA Green Book, El Paso County, Texas is currently an attainment area for the NAAQS (USEPA, 2021) with exception to PM-10 and is therefore subject to the General Conformity Rule of the Clean Air Act for the proposed action. However, Fort Bliss is not subject to El Paso County's non-attainment status conditions.

Sensitive air quality receptors are at a heightened risk of negative health outcomes due to exposure to air pollution and may include children, elderly, and asthmatics. Sensitive receptor locations may include hospitals, schools, residences, and other non-commercial facilities where sensitive air quality receptors may be located. The VA site proposed for development is located adjacent to the VA WBAMC, which is considered a sensitive air quality receptor. Aside from the adjacent medical facility, there are no other sensitive air quality receptors within a one-mile radius of the El Paso HCC.

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

Construction of the proposed action would result in fugitive dust emissions from soil disturbance and air pollutant emissions from vehicle engine exhaust and fuel combustion in off-road construction equipment. To the extent practicable VA would implement best management practices (BMPs) as referenced by the Texas Commission on Environmental Quality (TCEQ) to minimize any impacts. Additionally, Fort Bliss maintains a Title V permit which may need to be updated to reflect the increase in emissions from construction and operation activities at the proposed HCC site. The use of heavy construction vehicles, equipment, and diesel generators during construction would result in temporary, less than significant impacts to local air quality. Minimizing idling and properly maintaining equipment would reduce construction-related emissions. Routine erosion and sediment control BMPs such as watering exposed areas during dry periods, tracking control for construction equipment accessing the site, limiting grading during excessively windy days, and implementing stockpile stabilization practices. Dust generation is not expected to exceed State regulations and impacts would be temporary, localized, and minor in severity.

Currently, there are no applicable quantitative emission thresholds to evaluate the significance of greenhouse gases (GHG) and climate change impacts associated with individual projects under NEPA. As an indicator of the magnitude of GHG emissions considered worthy of regulatory development and tracking for stationary sources of emissions, USEPA's Mandatory GHG Reporting Rule has a threshold for rule applicability of 25,000 metric tons (MT) of carbon dioxide equivalent (CO2e) emissions per year (40 CFR Part 98) from stationary fuel combustion. The stationary sources (boilers and generators) may result in emissions that exceed USEPA's Mandatory GHG Reporting Rule threshold of 25,000 MT of CO2e emissions per year. This threshold does not imply significance for the proposed action and is only mentioned to indicate that the project may be subject to USEPA GHG reporting requirements.

The operation of the proposed facility would result in a net increase in long-term stationary combustion emissions associated with the daily operation of the VA HCC. Sources would include emissions from combustion operations (hot water boilers and emergency generators) and the increased use of privately-owned vehicles. An increase in vehicular emissions in the immediate area would be localized and would have a less than significant, long-term impact on the overall air quality of the region. Anticipated

emissions from boilers and emergency generators at the proposed VA HCC would also fully comply with USEPA NAAQS and the facility is therefore understood to have a less than significant, long-term impact on the overall air quality of the region.

3.2.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to air quality would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to air quality specific to that potential development.

3.3 Cultural and Historic Resources

Cultural resources are defined by the National Historic Preservation Act (NHPA) of 1966 (54 USC 306108) as a historic property, which means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term also includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. Historic properties include prehistoric and historic sites, structures, buildings, objects, districts, or any other physical evidence of human activity associated with important historic events, with persons important in history, representing the work of a master or exemplary as a type, or have or may yield information important to history or prehistory. Cultural resources are protected through several federal laws and associated regulations, including the NHPA, the Archaeological and Historic Preservation Act of 1974, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990.

Section 106 of the NHPA and its implementing regulations, 36 CFR Part 800, requires federal agencies to assess the potential impacts of an undertaking on historic properties that are within the proposed project's area of potential effects (APE), which is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist."

3.3.1 Affected Environment

The APE includes the 30-acre project site and the surrounding WBAMC and associated land (Figure 3-1). According to the Fort Bliss Integrated Cultural Resources Management Plan (ICRMP) (2017-2021), there are no culturally restricted areas on or in the immediate vicinity of the APE (Fort Bliss Directorate of Public Works, 2017-2021)[1].

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action

The proposed action would not have a direct impact on any known historic properties as defined in Section 106 of the NHPA. No eligible or listed sites occur within the vicinity of the VA HCC site proposed for development or the APE. Consultation was initiated with Texas Historical Commission (THC) to first verify eligibility of cultural resources listed within the proposed HCC APE. Fort Bliss's

[1] The *Integrated Cultural Resources Management Plan* (ICRMP) provides an overview of the archaeological and architectural history of Fort Bliss and presents the management procedures for archaeological sites, traditional cultural properties, and structures eligible for the National Register of Historic Places. The ICRMP (U.S. Army, 2008c) assists Fort Bliss in its efforts to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.

records contained discrepancies in eligibility of 29 sites that THC had listed as eligible. On February 7, 2022, THC concurred with Fort Bliss's determination that all of the 29 archaeological sites located within the proposed HCC APE are ineligible for inclusion in the National Register of Historic Places (NRHP) (Texas Historical Commission, 2022); VA also concurs with this determination. The proposed HCC building would also be architecturally consistent with surrounding developments, including the adjacent WBAMC.

SWCA Environmental Consultants (SWCA) was contracted by LRS to perform an intensive archeological survey of the proposed overhead powerline connection on Fort Bliss (refer to Section 3.13 for further information on utility options considered). This survey included a background review and pedestrian survey with shovel testing to determine if the proposed construction operations would impact any significant archaeological resources. No cultural resources were identified by this effort. Based on the field investigation results, VA determined that no historic cultural properties would be affected within the survey area for the proposed powerline connection (Figure 3-1).

While the preferred sanitary sewer connection for the facility has been identified within the APE, in the event that sanitary demand changes or the tie in within the APE is not cost-effective, Fort Bliss archaeologists performed an additional environmental review for an optional sanitary sewer line tie-in outside the APE at Kasserine Way (Figure 3-1). Based on review by the Fort Bliss Department of Public Works Environmental Division and the significant disturbance along the proposed sewer alignment, Fort Bliss determined the optional sanitary sewer line tie-in at Kasserine Way would also not affect any cultural or historic resources, and VA concurred with this assessment.

Section 106 consultation was initiated by VA on April 12, 2022, for the proposed action, including utility options under consideration with the determination that no historic resources would be affected by the undertaking within the APE. The Section 106 initiation letter provided in Appendix B contains a compilation of previously recorded archaeological sites within the APE for the proposed action that were found to be ineligible for inclusion in the NRHP, as previously mentioned. On May 9, 2022, VA received concurrence from THC that no historic properties would be affected by the proposed action (THC Tracking No. 202208986) (Appendix B). Any subsequent correspondence received from THC or tribal affiliates will be provided in the Final EA.

A project-related inadvertent discovery plan will be created, outlining procedures on what to do and who to contact if there is an inadvertent discovery as a result of any project-related excavation, grading, or ground-disturbing activities. If cultural materials or remains are encountered during construction or ground disturbing activities, work will cease in the immediate area. THC's Archeology Division will be contacted for further consultation in the event of inadvertent discoveries at 512-463-6096 to determine if the discovery is eligible for the NRHP. Upon its determination, the consulting Tribes will be contacted and appropriate treatment of discovered items in accordance with applicable state and federal law(s) will be negotiated.

Any discovery of possible human remains would also be managed by the procedures set out in the ICRMP. Should human remains be identified during ground-disturbing activities, all work in the vicinity of the discovery would cease immediately. An inadvertent discovery plan would be implemented, which would include the VA project representative initially contacting the El Paso County coroner to evaluate appropriate context of the human remains. As part of the cultural resources analysis and in accordance with Section 106, Fort Bliss would notify Native American Tribes, as appropriate, of all proposed undertakings potentially affecting resources of interest to the Native American Tribes. With the exception of the optional sanitary sewer connection at Kasserine Way and the proposed overhead powerline connection which are included in this proposed action (Figure 3-1), any proposed activities outside of the direct APE would require future Section 106 consultation with THC and Native American Tribes.

Because cultural resources would be avoided if encountered, impacts to cultural and historical resources would be negligible and therefore less than significant.

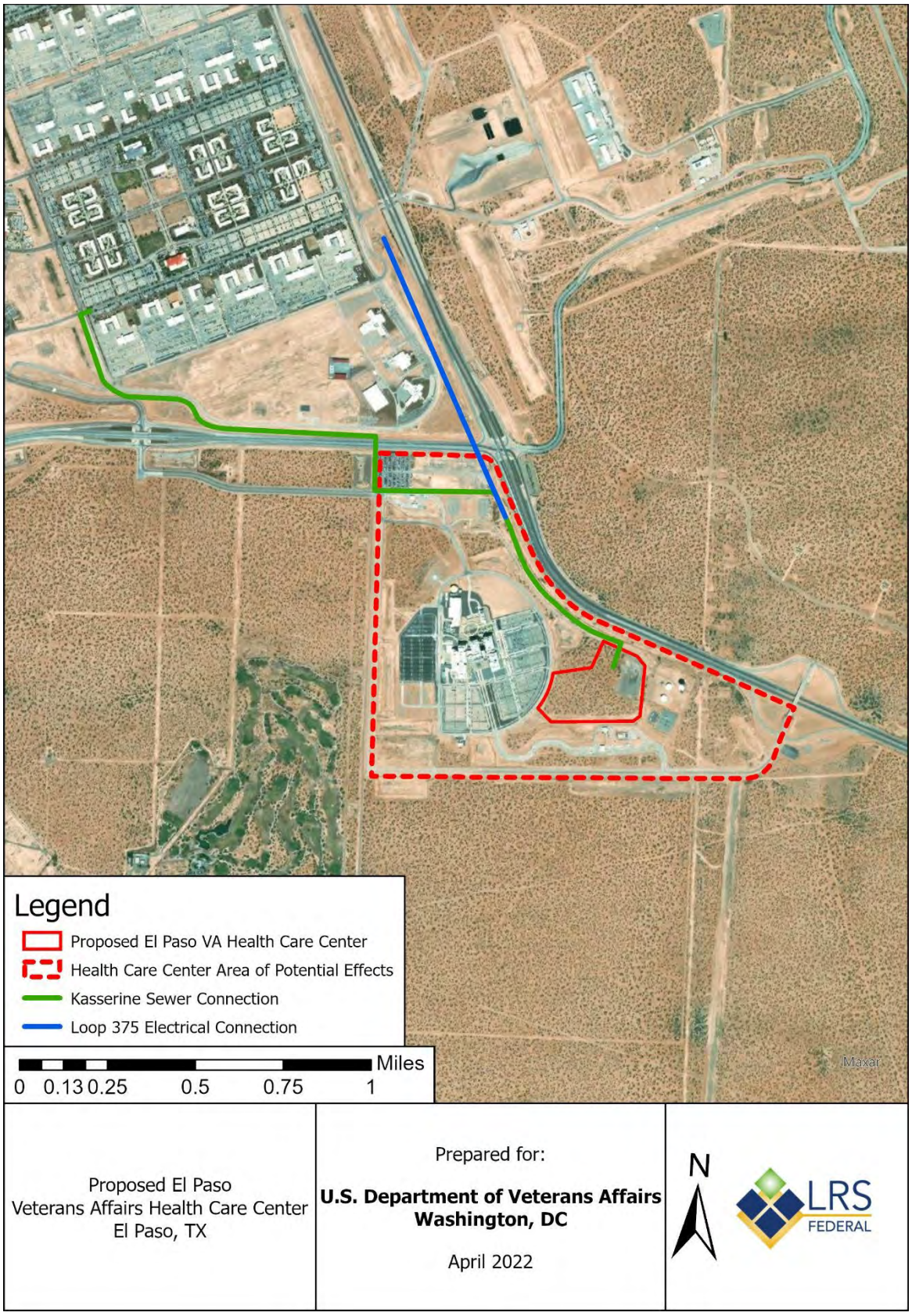


Figure 3-1. Area of Potential Effects Including Utility Connections

3.3.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to cultural or historic resources would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to cultural resources specific to that potential development.

3.4 Geology and Soils

3.4.1 Affected Environment

The proposed location for the El Paso HCC is within the Basin and Range physiographic province and is underlain by sand sheet deposits from the Holocene age. These deposits are unconsolidated and primarily consist of windblown sand with areas of large dunes in the Van-Horn El Paso Sheet (USGSb). The elevation of the site is approximately 3,990 feet above mean sea level (amsl), and the topography at and within the vicinity of the site is generally flat. A large portion of the Fort Bliss region lies inside the Rio Grande Rift, an area considered to be of moderate seismic activity. The peak acceleration (with 2% probability of exceedance) for the region is 10-14%g (USGSa, 2014).

According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service, the soil series on the site is Mcnew-Copia-Foxtrot complex, 1 to 5 percent slopes. This soil series is characterized as well-drained to excessively drained and primarily consists of sand and loam (USDA NRCS, 2019). The Farmland Protection Policy Act of 1994 is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses (USDA). The soil series on the site is not considered to be a prime farmland soil (USDA NRCS, 2019).

3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

The proposed action construction activities would result in ground disturbance of more than one acre of land, which would require a Stormwater Pollution Prevention Plan (SWPPP) and Erosion and Sediment Control Plan (ESCP) to implement erosion and sediment control BMPs. Since construction would require that limited vegetation cover be removed, soil on the site would be more susceptible to erosion by wind and surface runoff. Additionally, compaction of the soils and removal of vegetation has the potential to increase stormwater runoff. BMPs, such as dust controls, wind fences, perimeter controls, and soil stabilization practices would reduce the potential for soil erosion. The proposed construction activities would result in minimal changes to geology, soils, and topography and would therefore, result in less than significant impacts.

3.4.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to geology or soils would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to geology and soils specific to that potential development.

3.5 Hydrology and Water Quality

3.5.1 Affected Environment

The proposed El Paso HCC location does not contain any surface waters on the site. The nearest surface water to the site is a stormwater catch basin located adjacent to the northwest corner of the site. The average depth to groundwater for the soil series located on the site (Mcnew-Copia-Foxtrot complex, 1 to 5 percent slopes) is greater than 80 inches or approximately 6.5 feet (USDA NRCS, 2019). Currently, the

site is not located within a wellhead protection area, which is a drinking water source area for a public water supply. Therefore, the project is not subject to additional groundwater protections put in place by the city (USGSc). Drinking water in the region is supplied by the Rio Grande and the Elephant Butte Reservoir.

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action

Land disturbance of an area greater than one acre would require permit authorization under the National Pollutant Discharge Elimination System (NPDES), including a SWPPP, to control stormwater impacts. BMPs, such as the use of sediment control fences, perimeter controls, and soil stabilization practices, may be used to control erosion and sediment transport during construction. During operation, the engineered stormwater retention systems would manage impacts from precipitation events. Stormwater at the proposed HCC location would flow to the catch basin located northwest of the site. Impacts to groundwater are not anticipated since groundwater is not likely to be encountered. If groundwater is encountered during construction, groundwater engineering controls would be implemented. As a result, permanent impacts to hydrology and water quality in the vicinity of the site would be less than significant.

3.5.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to hydrology or water quality would occur as a result of VA's actions. However, the proposed sites could be developed by others with the potential for impacts to hydrology and water quality specific to that potential development.

3.6 Wildlife and Habitat

3.6.1 Affected Environment

The site for the proposed El Paso HCC is currently flat, undeveloped, sparsely vegetated land. Low-lying desert plants are the primary vegetation inhabiting the sandy soil.

The United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool (USFWS) and the Texas Parks and Wildlife Department (TPWD) website (Texas Parks and Wildlife, 2021) were reviewed to identify potential federally or state-listed protected species on or in the vicinity of the proposed El Paso HCC site. The species identified from these sources and the potential for habitat at the site are listed in Table 3-2.

Table 3-2. Federally and State Listed Protected Species

Common Name	Scientific Name	Listing Status	Habitat Description	Potential Habitat Present
Birds				
Mexican Spotted Owl	*Strix occidentalis lucida*	FT, ST	Remote, shaded canyons of coniferous mountain woodlands (pine and fir); day roosts in densely vegetated trees, rocky areas, or caves.	No
Northern Aplomado Falcon	*Falco femoralis septentrionalis*	FE	Open terrain with scattered trees or shrubs; yucca-covered sand ridges in coastal prairies, riparian woodlands in open grasslands, and in desert grasslands with scattered mesquite and yucca.	No
Piping Plover	*Charadrius melodus*	FT	Open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands of major river systems.	No
Red Knot	*Calidris canutus rufa*	FT	Shorelines of large lakes or freshwater marshes.	No
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	FE, SE	Thickets of willow, cottonwood, mesquite, and other species along desert streams.	No
White-faced Ibis	*Plegadis chihi*	ST	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies; nests in marshes, low trees, on the ground in bulrushes or reeds, or on floating mats.	No
Yellow-billed Cuckoo	*Coccyzus americanus*	FT	Cottonwood and willow trees; large blocks of riparian habitat for nesting.	No
Fish				
Speckled Chub	*Macrhybopsis aestivalis*	ST	Occurs most frequently between the Rio Conchos confluence and the Pecos River.	No
Flowering Plants				
Sneed Pincushion Cactus	*Coryphantha sneedii var. sneedii*	FE, SE	Xeric limestone outcrops on rocky, usually steep slopes in desert mountains, in the Chihuahuan Desert succulent shrublands or grasslands.	No

Reptiles				
Mountain Short-horned Lizard	*Phrynosoma hernandesi*	ST	Terrestrial; generally restricted to high elevation grasslands and forested areas with open ground; soil may vary from rocky to sandy; burrows into soil or occupies rodent burrow when inactive.	No
Texas Horned Lizard	*Phrynosoma cornutum*	ST	Terrestrial; open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush, or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows or hides under rock when inactive.	Yes

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

VA requested early coordination with TPWD regarding the proposed action during project scoping in August of 2021. On August 3, 2021, TPWD provided general construction recommendations to assist in project planning and compliance with state and federal laws including the Migratory Bird Treaty Act (MBTA) and the Texas Parks and Wildlife Code. Appendix B contains TPWD correspondence received. TPWD has recommended that sediment control fence be used during construction to exclude any wildlife from the construction area. The exclusion fence should be buried at least six inches and be at least 24 inches high. Additionally, any open trenches or excavation areas should be covered overnight and inspected every morning to ensure no wildlife species have been trapped. Additionally, TPWD recommends committing to dark-sky lighting practices for the HCC construction and operation.

For soil stabilization and revegetation of disturbed areas on the site, TPWD recommends mulch stabilization materials that avoid entanglement hazards to wildlife. No-till drilling, hydro-mulching, and hydroseeding should be considered during construction to prevent soil erosion and reduce risk to wildlife. Although not anticipated, impacts to burrows or other suitable habitat on the site should be avoided and disturbance to or removal of downed trees, rotting stumps, and leaf letter should be minimized where feasible. TPWD also recommends limiting the amount of vegetation proposed for clearing and revegetating the undeveloped areas with native species, incorporating pollinator conservation and management into the revegetation and maintenance plan to the extent practicable. Vegetation clearing activities should be excluded during the migratory bird nesting season, March 15th through September 15th, to avoid adverse impacts to breeding birds. Further, active bird nest surveys should be performed no more than five days prior to planned clearing or construction, and a minimum 150-foot buffer of vegetation should remain around any active nests that are observed prior to disturbance. To reduce risk to reptiles, construction activities should also be limited, to the extent practicable, during April and May and after October. When designing roads or parking areas with curbs, VA should also consider using Type I or Type III curbs to provide a gentle slope, enabling turtles and small animals to get out of roadways.

Since the project area may provide suitable habitat for the state-listed Texas Horned Lizard, TPWD recommends providing training for protected species prior to construction, biological monitoring by permitted biologists during construction, and reducing speed limits in the project area to at least 15 miles per hour. VA should request the most recent Texas Natural Diversity Database data on a regular basis and report all encounters of Species of Greatest Conservation Need to TPWD. A “No Kill Wildlife Policy” should also be implemented during construction. Should wildlife be encountered during construction, VA should follow the appropriate TPWD protocol. Any translocations of reptiles should be the minimum

distance possible (no greater than one mile and preferably within 100 to 200 yards from the initial encounter location), and contractors should be informed to allow reptiles to safely leave the project area. As recommended by TPWD and outlined within the Integrated Natural Resource Management Plan for Fort Bliss (INRMP), revegetation with native species in temporarily disturbed areas and invasive species management to reduce establishment and proliferation of invasive plant species would minimize impacts to vegetative habitat. [2]

To properly assess any biological impacts associated with the proposed overhead powerline extension, LRS contracted SWCA to perform a biological survey of the area. SWCA's report found that the proposed construction activities for the powerline would have no significant or long-term effects on migratory birds and no impacts to bald and golden eagles or to any U.S. waters. SWCA's findings identified the potential for the occurrence of the special-status mountain short-horned lizard and Texas horned lizard at the proposed electrical utility location; however, since the project area occurs within a highly disturbed, urban area, the occurrence of the two species would be rare. The report also stresses the importance of implementing many of the BMPs outlined by TPWD to protect wildlife and habitat in the area during ground-disturbing activities (SWCA Environmental Consultants, 2022).

Fort Bliss Natural Resources staff collaborated on the environmental review of the proposed sanitary sewer line tie-in option at Kasserine Way. The review identified the invasive plant species, African rue and star-thistle, as occurring on Fort Bliss. It was therefore recommended that all earth-moving equipment be thoroughly washed prior to and before leaving the site to prevent both the introduction and spread of invasive plant species. Areas disturbed during construction should be revegetated with native species conducive to the soil type. This review also stressed the importance of performing an avian nest search should vegetation need to be removed during the migratory bird nesting season and utilizing fencing for staging equipment and materials storage areas, including a buried apron of chain-link fence (Fort Bliss Environmental Division, 2022).

Impacts to wildlife and habitat would be localized and less than significant. The VA supports the implementation of the previously mentioned BMPs during the construction of the El Paso HCC, to the extent practicable.

3.6.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to wildlife or habitat would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to wildlife and vegetative habitat specific to that potential development.

3.7 Noise

3.7.1 Affected Environment

The existing noise environment around the proposed El Paso HCC site is dominated by vehicle traffic and parking, as well as airplane traffic associated with the El Paso International Airport located approximately one mile southwest of the site. No other notable noise-generating sources are present in the immediate vicinity of the site location. Sensitive noise receptors are land uses associated with activities which are particularly sensitive to noise, such as medical facilities, hospitals, residential areas, schools, churches,

[2] The *Integrated Natural Resources Management Plan* (INRMP) guides the implementation of a natural resources program at Fort Bliss to ensure that the installation complies with applicable environmental laws and regulations (U.S. Army, 2001a). The INRMP describes the procedures and best management practices used at Fort Bliss to ensure that impacts to the environment from construction, training, and operational activities are reduced.

parks, or recreational areas. The site is located adjacent to the VA WBAMC, which is considered a sensitive noise receptor. Aside from the medical facility, there are no other sensitive noise receptors in the surrounding area.

3.7.2 Environmental Consequences

3.7.2.1 Proposed Action

During the construction phase, noise level increases would be localized, intermittent, and temporary. These increases would mainly result from the use of heavy construction equipment (e.g., bulldozers, scrapers, dump trucks, and concrete mixers) and the hauling of construction supplies and materials. Construction noise levels would primarily be limited to the immediate vicinity of the VA HCC site and would mainly impact the health of the construction workers. Adherence to appropriate Occupational Safety and Health Act standards (29 CFR 1926.52) would protect workers from excessive noise. Construction-related noise impacts on the adjacent VA WBAMC would be minor and temporary in nature. Temporary noise impacts related to construction would not adversely affect WBAMC staff or patients, with construction being approximately 1,500 feet away from sensitive noise receptors and located generally indoors. The proposed action would increase traffic noise above levels that currently exist on the surrounding roads. Increased noise levels from road traffic resulting from hospital employees (many working on shift schedules), patients, and visitors would be transitory and distributed throughout the day. Overall, it is expected that noise impacts would be minimal as the increases would mainly be localized (traffic along the main roads) and would not adversely impact any sensitive receptors or ongoing operations nearby at the VA WBAMC. Less than significant noise impacts as a result of the proposed action are anticipated.

3.7.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to the existing noise environment would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to noise specific to that potential development.

3.8 Land Use

3.8.1 Affected Environment

The proposed location for the new El Paso HCC is adjacent to the WBAMC on Fort Bliss in El Paso, Texas. The site encompasses approximately 30 acres of predominantly flat undeveloped land. Approximately 0.5 miles southeast of the property is Butterfield Trail Golf Club, which is zoned C-4 (Regional Commercial District), followed by the El Paso International Airport, which is zoned M-1 (Light Manufacturing District). Local zoning codes to not apply to federally owned lands, so there are no zoning ordinances associated with Fort Bliss; however, the federally owned surrounding area is predominantly used for medical and commercial facilities or remains undeveloped (City of El Paso Planning Department).

3.8.2 Environmental Consequences

3.8.2.1 Proposed Action

Under the proposed action, approximately 30 acres of predominantly flat, undeveloped land would be allocated for the proposed VA HCC. The proposed action is consistent with the guiding principles of the Real Property Master Plan (RPMP) for Fort Bliss. The HCC site is located within an area categorized as land planned for future residential/commercial use in the RPMP (USACE, 2006). The HCC site is bounded by the WBAMC to the northwest, Loop 375 to the immediate north, and mostly undeveloped

land in the City of El Paso to the south. Vacant land to the east is categorized in the RPMP for tactical operations. The proposed VA HCC would not conflict with existing or proposed land uses adjacent to the site. The proposed action would have less than significant, long-term impacts on land use at Fort Bliss.

3.8.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to land use would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to land use specific to that potential development.

3.9 Socioeconomics

3.9.1 Affected Environment

Socioeconomics can be characterized as the demographics, employment, and income of a region. Population and Veteran status data (Table 3-3) and income, poverty, and employment data (Table 3-4) were obtained from the United States Census Bureau. Data from the 2019 American Community Survey 5-year estimates were used (United States Census Bureau).

Table 3-3. Population and Veteran Status

Geographic Area	Population	Population Under 18 Years	Population 65 Years and Over	Minority	Veterans
Texas	28,260,856	20.9%	10.6%	58%	7%
El Paso County	836,062	27.5%	11.9%	88%	8.1%

The major demographic differences between the State of Texas and El Paso County are associated with age and minority status. There is a greater percentage of the population under the age of 18 years in El Paso County than Texas. There is also a 30% difference in minority populations, with El Paso County exceeding the State average.

Table 3-4. Income, Poverty, and Employment

Geographic Area	Number of Households	Median Household Income	Percent Below Poverty Level	Unemployment Rate (as of August 2021)
Texas	9,691,647	$61,874	14.7%	5.1%
El Paso County	269,150	$46,871	20.2%	6.1%

Regarding economic data, the median household income in El Paso County is lower than the median household income for Texas. There is also a greater percentage of the population below the poverty level in El Paso County as compared with the State. The unemployment rate is one percentage point higher in El Paso County than Texas.

Since the proposed VA HCC site is currently undeveloped, children are not regularly present at the site. Additionally, there are no schools or playgrounds, where a proportionately high number of children could be located, in the immediate vicinity of the site.

3.9.2 Environmental Consequences

3.9.2.1 Proposed Action

Based on similar projects, the proposed action has the potential to generate temporary employment in the area, including construction jobs, which would result in short-term, direct socioeconomic benefits to the immediate area. Long-term, socioeconomic impacts include permanent employment opportunities at the HCC, which would include a proposed 987 staff members. The HCC would also likely provide long-term beneficial health impacts by enhancing health care for Veterans in the region.

Because children may suffer disproportionately from environmental health risks and safety risks, Executive Order 13045, Protection of Children From Environmental Health Risks and Safety Risks, was introduced in 1997 to prioritize the identification and assessment of environmental health risks and safety risks that may affect children and to ensure that federal agencies' policies, programs, activities, and standards address environmental risks and safety risks to children.

There are no schools or playgrounds in the immediate vicinity of the site, and the construction site would be secured to prevent unauthorized access by children and others. As noted in Sections 3.2 and 3.7, BMPs will also be implemented during construction to control construction noise and fugitive dust. Therefore, there are no anticipated impacts to child populations. The favorable impacts to socioeconomics in the region as a result of local employment growth are minor in comparison to the overall local economy, and therefore are considered less than significant.

3.9.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to socioeconomics would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to socioeconomics specific to that potential development.

3.10 Community Services

3.10.1 Affected Environment

The site is located in El Paso Independent School District; however, there are no schools within a one-mile radius of the site.

The site is serviced by the Fort Bliss Military Police, located approximately two miles northwest of the site, and the Fort Bliss Fire Department Station 1, located approximately seven miles west of the site. The nearest public police department to the site is the El Paso Police Department Pebble Hills Regional Command, and the nearest public fire station to the site is the El Paso Fire Station 25. A fire station is also proposed to adjoin the southeast corner of the site. The WBAMC, located adjacent to the western boundary of the site, provides emergency and non-emergency medical and hospitalization services.

Additionally, there are no public parks within a one-mile radius of the site; however, there is a municipal golf course, Butterfield Trail Golf Club, located approximately 0.5 miles southeast of the property.

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

The proposed action is not expected to place additional substantial demands on police, fire, emergency services, or other community services. No significant impacts to community resources are anticipated as a result of the proposed action. Further, no public transportation service expansions are proposed as part of the proposed action.

During construction, any potential partial road closures related to utility tie-in locations at Loop 375 would be temporary. Closures would be coordinated with the El Paso Police and Fire Departments to prevent any significant disruptions to their services. Overall impacts to community services are therefore considered less than significant.

3.10.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to community services would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to community services specific to that potential development.

3.11 Solid Waste and Hazardous Materials

3.11.1 Affected Environment

The Resource Conservation and Recovery Act (RCRA), Subtitle I, provides a comprehensive regulatory program for underground storage tanks (USTs) storing petroleum or certain hazardous substances. Facilities with aboveground storage tanks (ASTs) holding oils of any kind are generally subject to USEPA's Spill Prevention, Control, and Countermeasure (SPCC) regulation (40 CFR Part 112). There are four 30,000-gallon diesel ASTs and four 7,000-gallon ASTs for generator backup fuel which are DoD-owned and support the WBAMC physical plant located immediate north of the proposed location. There are also three DoD-owned ASTs located adjacent and east of the site for water storage and treatment.

The Municipal Solid Waste Permits Section of the TCEQ oversees medical waste management activities. For the generation, storage, and handling of medical waste as regulated under Texas Administrative Code, Subsection 326.3, consistent with its federal status as outlined in Section 3.0, the VA HCC would maintain a registration with TCEQ, or based on the terms of the host/tenant agreement with Fort Bliss, operate under the current Fort Bliss registration. Medical wastes include wastes generated by hospitals, clinics, physicians' offices, dental offices, veterinary facilities, and other medical laboratories and research facilities. Biohazardous waste can typically include human blood and blood products; cultures and stocks of infectious agents and associated biological, isolation wastes; contaminated and unused sharps; animal carcasses; contaminated bedding material; and pathological wastes.

Fort Bliss tenant commands and support facilities (i.e., the Dental Clinic, two Blood Banks, the Veterinary Clinic, the Troop Clinic, and the WBAMC) generate medical and biohazardous waste that is collected and stored at the generating locations. Medical wastes are picked up by a licensed medical waste contractor daily and as needed for proper disposal.

Non-hazardous solid waste generated at Fort Bliss that cannot be recycled is collected and properly disposed of outside of the Fort Bliss installation. The TCEQ NPDES Construction General Permit (TXR150000) and TCEQ Industrial and Hazardous Waste Permits Section provide guidance on the proper storage, handling, disposal of hazardous and non-hazardous construction materials, products, and wastes. Consistent with its federal status as outlined in Section 3.0, the VA HCC would follow this guidance.

3.11.2 Environmental Consequences

3.11.2.1 Proposed Action

The proposed action would not impact the known USTs located within the project vicinity. Should any buried fuel lines be discovered during construction activities, the Contracting Officer's Representative and Petroleum Storage Tank Program Manager would be contacted. During construction, the presence and use of petroleum and hazardous substances could increase the potential for accidental release or spill

of oil, diesel, gasoline, and antifreeze. In accordance with a site-specific Spill Prevention Control & Countermeasure Plan (SPCCP), standard construction BMPs would be implemented to minimize potential impacts, including proper storage and appropriate labeling of petroleum products and hazardous materials in approved containers; storage of containers on a level and impervious surface; and use of secondary containment systems around fuel storage containers during refueling activities. Should a spill or release occur, any impacted soil would be properly handled per federal and state laws and regulations.

While not anticipated, should asbestos-containing concrete pipe be encountered during excavation, the material would not be disturbed by grinding, breaking, scraping, or crushing. The asbestos-containing material would be abated by a licensed contractor with properly trained personnel using BMPs and proper handling and disposal of asbestos-containing pipe. Otherwise, the excavation would be deviated, leaving the asbestos-containing pipe undisturbed and abandoned in place. Any regulated waste generated during construction would be stored in a waste satellite accumulation point (i.e., aerosol cans, petroleum, oil, and lubricant products). Any other construction materials or waste generated during construction would be the responsibility of the project proponent to remove. All construction, excavation, cleaning, and/or waste removal operations would be conducted in compliance with applicable environmental regulations and debris would be recycled or diverted, in accordance with Fort Bliss's construction and demolition debris diversion policy.

While there is no known contamination of the proposed site and there is no expectation any would be discovered, if suspect contamination is encountered, environmental sampling of the HCC development site would be conducted to further characterize the site and identify any potential soil contaminants. If soil contamination is found, it would be remediated in accordance with all applicable regulations prior to construction.

Long-term and significant increases in the amount of hazardous waste generated by the VA HCC are not anticipated. Wastes generated during operation of the HCC would be managed in compliance with federal and state laws and regulations. Operation of the proposed new VA HCC would generate general, hazardous, and medical waste. Similar waste generating activities are currently ongoing at the nearby WBAMC. The type of waste generated would be similar and waste generation would not increase significantly. Through proper storage and disposal practices, permanent impacts related to solid waste and hazardous materials are anticipated to be less than significant.

3.11.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to solid waste or hazardous materials would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts associated with solid waste or hazardous materials specific to that potential development.

3.12 Traffic, Transportation, and Parking

3.12.1 Affected Environment

A traffic impact study was completed in July 2021 for the El Paso HCC site (LRS Federal LLC via CobbFendley, 2021). Major roads and roadways in the vicinity of the site include:

- Purple Heart Memorial Highway (Texas State Highway Loop 375)
- Liberty Expressway (Spur 601)
- Constitution Avenue
- Iron Dustoff Drive
- Iron Medics Drive

The study describes the current capacity of the roads and the existing level of service (LOS) for the study intersections. The LOS is based on the estimated delay at the intersection and ranges from A, the best, to F, which is the worst. For unsignalized intersections, operational standards are an LOS of E or better, and for signalized intersections, operational standards are an LOS or D or better (LRS Federal LLC via CobbFendley, 2021). Table 3-5 lists the description of each level of service rating.

Table 3-5. Level of Service Descriptions

Level of Service	Description
A	Little or no delay
B	Little to no delay
C	Average delay
D	Delay is increasing and noticeable
E	Limit of acceptable delay
F	Major delay; characteristic of oversaturated conditions

The current LOS is shown for each major intersection in the vicinity of the El Paso HCC site (Table 3-6). Currently, there are two intersections which have failing LOS: the intersection of Loop 375 Southbound Frontage Road and Spur 601 and the intersection of Loop 375 Northbound Frontage Road and Spur 601 (LRS Federal LLC via CobbFendley, 2021).

Table 3-6. Existing Level of Service at Major Intersections

Intersection	Intersection Type	2021 LOS (AM/PM)
Spur 601 Eastbound Frontage Road and Constitution Avenue	Signalized	B/B
Spur 601 Westbound Frontage Road and Constitution Avenue	Signalized	B/C
Loop 375 Southbound Frontage Road and Spur 601	Signalized	F/F
Loop 375 Northbound Frontage Road and Spur 601	Signalized	F/E
Loop 375 access road (North) Road and Iron Medics Drive	Unsignalized	A/A
Loop 375 access road (South) and Iron Medics Drive	Unsignalized	A/A
Iron Dustoff Drive and Constitution Avenue	Unsignalized	A/A

3.12.2 Environmental Consequences

3.12.2.1 Proposed Action

During proposed action construction activities, there would be an increase in construction vehicles that would likely contribute to a temporary increase in traffic volumes, congestion, delays, and possibly detours. These traffic impacts would be temporary and localized.

The anticipated LOS at major intersections in the vicinity of the site under a full build-out scenario of the proposed action in 2027 is shown in Table 3-7. The proposed action does not contribute to additional intersection LOS failures. The minor decline in the LOS for the intersection of Loop 375 Northbound

Frontage Road and Spur 601 from E to F is insignificant due to the already failing status of the intersection.

Table 3-7. Full Build-out 2027 Level of Service at Major Intersections

Intersection	Intersection Type	Full Build-out 2027 LOS (AM/PM)
Spur 601 Eastbound Frontage Road and Constitution Avenue	Signalized	B/B
Spur 601 Westbound Frontage Road and Constitution Avenue	Signalized	B/C
Loop 375 Southbound Frontage Road and Spur 601	Signalized	F/F
Loop 375 Northbound Frontage Road and Sur 601	Signalized	F/F
Loop 375 access road (North) Road and Iron Medics Drive	Unsignalized	A/A
Loop 375 access road (South) and Iron Medics Drive	Unsignalized	A/A
Iron Dustoff Drive and Constitution Avenue	Unsignalized	A/A

Trip generation calculations were performed for the proposed HCC and the existing WBAMC for comparison during peak hours (Table 3-8) (LRS Federal LLC via CobbFendley, 2021).

Table 3-8. Peak Hour Trip Generation

Facility	Peak Hour	Gross Floor Area (sqft)	Entering Volume	Exiting Volume	Total Volume
VA HCC	AM	500,000	337	159	496
	PM		167	354	521
WBAMC	AM	1,132,000	656	308	964
	PM		336	715	1,051

The calculations show that the existing WBAMC generates approximately two trips for every one trip that the proposed HCC would generate. Thus, most of the traffic increase in the study area is associated with the WBAMC rather than the HCC. While the total traffic volume may increase in the area, it is more likely to be associated with the WBAMC than the HCC (LRS Federal LLC via CobbFendley, 2021).

The proposed action would also include the construction of approximately 1,500 - 2,000 surface parking spaces. This would be a sufficient amount of parking for the anticipated patients and 987 to be employed at the VA HCC. VA would ensure that all paved parking areas are designed to convey stormwater runoff to the catch basin located northwest of the site.

The VA threshold for traffic impacts, is defined in 38 CFR 26(2)(ii), as “an increase in average daily traffic volume of at least 20 percent on access roads to the Site or the major roadway network.” The

average daily traffic volume increase for all studied intersections associated with this proposed facility is 17.2 percent, which is below VA's standard threshold for significance of 20% (LRS Federal LLC via CobbFendley, 2021). Therefore, impacts to local traffic are anticipated to be less than significant.

3.12.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to traffic, transportation, or parking would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to traffic specific to that potential development.

3.13 Utilities

3.13.1 Affected Environment

This section describes the available sources for major utilities required at the VA HCC site, including potable water, wastewater collection and treatment (i.e., sewer), electrical power, and natural gas supplies. The tie-in locations for utility connections are dependent on final design and site layout for the VA HCC. Fort Bliss Water Services Company (FBWSC) maintains a water service loop which provides potable water to the WBAMC. FBWSC has identified two connection locations for 6- to 8-inch diameter combination service water lines to supply the proposed HCC. The El Paso Natural Gas Company (EPNG) supplies natural gas to Fort Bliss, which is the primary heating fuel at Fort Bliss and surrounding facilities. A number of distribution points are dispersed on a looped gas distribution network, with an estimated total capacity of 2.5 million cubic feet per hour (CFH), that is owned and maintained by Texas Gas Service. The nearest gas line to the preferred site is located immediately northwest and adjacent to the proposed VA HCC site.

Electrical power is currently supplied to Fort Bliss by El Paso Electric Company (EPEC) which generates electricity from two interconnected plants. An EPEC high-voltage overhead electrical line runs south of the proposed site with overhead transmission lines (i.e., electrical feeds) running west of and adjacent to Loop 375. The Rio Grande Electric Cooperative (RGEC) is the electrical maintenance provider for Fort Bliss, El Paso, and Del Rio Laughlin Air Force Base. RGEC does not sell power but maintains an electric transformer located immediately east of the proposed HCC site. Viable electrical connections are located directly east for the VA HCC site through the RGEC-owned transformer.

Wastewater generated at Fort Bliss is managed on base by the FBWSC and generally flows through five connections to the City of El Paso's sewer system for treatment at the Haskell Street Wastewater Treatment Plant. EPWU has published Rule #9 to provide enforcement guidance with regard to wastewater discharges and has placed discharge restrictions and limits on wastewater. Fort Bliss has a wastewater discharge agreement with EPWU regarding Industrial Pretreatment (IPT) practices. In response to mercury exceedances, the nearby WBAMC was required to install amalgam/mercury filtration systems.

3.13.2 Environmental Consequences

3.13.2.1 Proposed Action

Coordination with utility companies and government agencies would be required to ensure design conformance and environmental compliance during project design and site layout for utility connections and tie-in locations. FBWSC potable water as well as EPNG natural gas utilities are located within the vicinity of the proposed project site.

Potable water for the proposed VA HCC would be supplied by the FBWSC through existing water lines located east of the site and adjacent to the WBAMC. The proposed action would require a connection to the existing WBAMC water service loop located within the identified project area/APE. FBWSC

confirmed that they are able to meet the estimated potable water demand flow rates for the VA HCC (LRS Federal LLC, 2021) (Appendix D). No significant impacts on the existing water system are expected based on anticipated consumption rates. To achieve redundancy in water service, as recommended through VA Site Design Criteria, onsite water storage tanks would be connected to the Fort Bliss Department of Public Works (DPW)-owned 36-inch water main and would be located adjacent to the Central Energy Plant (RLF, 2021). The proposed VA HCC would also be constructed to meet, at a minimum, LEED Silver Certification standard which requires installing fixtures designed to reduce water use. Therefore, the VA HCC is not anticipated to cause a significant increase in water demand.

Natural gas would be required for the proposed action, and it is expected that the demand for natural gas would be met by the existing supplies and would not significantly impact supplies and transmission infrastructure. Natural gas would be delivered to the proposed site from the closest point in the high-pressure gas distribution system that currently exists to the immediate northwest, near the WBAMC. No significant amount of trenching, vegetation removal, or ground disturbance is anticipated to occur in order to tie-in to the existing high-pressure gas distribution system from the proposed VA HCC site.

Electrical connections would be required for the proposed VA HCC. It is expected that the demand for electricity by the proposed VA HCC would be met by the existing supplies and would not significantly impact electrical utilities and transmission infrastructure. Two electrical connections are being considered to serve the VA HCC prior to final engineering design, both providing power generated by EPEC. Viable electric connections to the immediate east are being considered through the RGEC-owned transformer, while connections to EPEC's high-voltage overhead lines that run adjacent to Loop 375 also provide a second electric access option. Connecting to the available public electrical power supply would require EPEC to connect the overhead Milagro Feed, located north of Spur 601 and west of Loop 375, with the overhead Global Reach Feed that is located between the proposed project APE and Loop 375. Approximately 4,600 feet of overhead wire and new pole sites would be required to span the break between EPEC electrical feeds. This would supply power to the VA HCC site. Neither option to tie-in to existing electrical facilities would require new substations or considerable footprints for construction. A review of cultural and biological resources in the area where the new pole sites would be required was conducted (see Section 3.3 for additional information).

Once final engineering work begins, a specific connection point would be determined for sewer access. Two options are being considered to connect the VA HCC site via an FBWSC 18-inch gravity main to the off-base El Paso sewer system. The first option is to tie-in to the sanitary line servicing the WBAMC facility adjacent to the proposed HCC site. The second option under consideration is to connect to the existing 24-inch main on Kasserine Way, located approximately 2.15 miles northwest within the Brigade Combat Teams (BCT) complexes that are positioned north of Spur 601. If the connection was through the existing BCT infrastructure, tunneling or boring would be required to allow the proposed force main to reach the north side of Spur 601. Fort Bliss has conducted an environmental review of the areas which would require ground disturbance for this sewer connection option (see Section 3.3 for additional information). The capacity of the gravity sewer lines would be sufficient to carry the additional quantity of wastewater generated by the proposed new VA HCC. It is also expected that FBWSC onsite sanitary system lines and EPWU's existing offsite wastewater treatment facilities would be able to handle the new wastewater generated by the proposed HCC and would result in minor impacts to existing systems.

Other additional areas of concern for the VA HCC site that may require additional monitoring would be biohazards discharged into the sewer system (operating rooms, autopsy rooms, mechanical rooms, anti-corrosion/de-scaling chemicals/additives used in boilers and chillers).

Connections to the aforementioned utilities would not involve a significant amount of new construction or ground disturbance. Less than significant impacts to all utilities are anticipated as a result of the proposed action.

3.13.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to utilities would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to utilities specific to that potential development.

3.14 Environmental Justice

3.14.1 Affected Environment

The USEPA-developed environmental justice (EJ) screening and mapping tool, EJSCREEN, was used to identify and compare minority and low-income populations. These populations in the vicinity of the sites were compared to statewide data. A 5-mile buffer was applied around the El Paso HCC site, located in EPA Region 6. Table 3-9 summarizes the data from EJSCREEN (EPA, 2020).

Table 3-9. Summary of Environmental Justice Data

Demographic Indicator	Texas	El Paso HCC
Minority Population	58%	86%
Low-income Population	35%	39%

Based on the population data, the El Paso HCC is located in an area with disproportionately high minority populations and slightly higher than the State of Texas's average low-income populations.

3.14.2 Environmental Consequences

3.14.2.1 Proposed Action

While Fort Bliss does include higher percentages of minority and low-income populations than the state averages, the proposed action is not anticipated to significantly impact any environmental resource areas and would therefore, not significantly impact these populations from an EJ point of view. Additionally, the El Paso HCC would be located on the installation and away from residential areas.

The construction of the proposed VA HCC would, however, provide additional economic stimulus and might attract construction workers to the region temporarily, depending upon local availability in the labor pool. The HCC would also permanently employ approximately 987 staff. Staffing needs created by the proposed action would also attract medical personnel to the region. Employment opportunities provided by the proposed action would not result in disproportionate or significant impacts to EJ populations. Ultimately, the HCC would provide high-quality health care to Veterans in the region.

3.14.2.2 No Action Alternative

Under the no action alternative, construction of the VA HCC would not occur. No impacts to minority or low-income populations would occur as a result of VA's actions. However, the proposed site could be developed by others with the potential for impacts to air quality specific to that potential development.

3.15 Cumulative Impacts

As defined by the CEQ Regulations in 40 CFR 1508.7, cumulative impacts are those which "result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future action, without regard to the agency (Federal or non-Federal) or individual who undertakes such other actions." "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7)." Cumulative impact analysis captures the effects that result from the proposed action in combination with the effects of other actions

taken during the duration of the proposed action in the same geographic area. Because of extensive influences of multiple forces, cumulative effects are the most difficult to analyze.

NEPA requires the analysis of cumulative environmental effects of a proposed action on resources that may often be manifested only at the cumulative level to the extent reasonable and practical. Much of the undeveloped land on Fort Bliss and surrounding areas is degraded because of past and current uses (e.g., grazing, urban development, military training activities). Based on surrounding land use and development trends in proximity to the proposed El Paso HCC site, environmental resources within the project vicinity are not particularly vulnerable to cumulative impacts that may result from the construction and operation of the proposed HCC. The proposed project would not result in continued development on Fort Bliss and is unlikely to result in cumulative impacts on the surrounding non-military land uses. Further, no other projects or developments are currently proposed in the site vicinity, that when combined with the proposed action, would result in an increase in pressure on community services or increases in demand for specific utilities, including water supply.

Opportunities for avoiding, minimizing, or mitigating cumulative impacts related to infrastructure improvements or facility upgrades on Fort Bliss are incorporated by design or through the management processes. They include such measures as energy-efficient facility design; executing a programmatic agreement for historic properties; implementing projects in the INRMP; and maintaining Stormwater Management, Spill Prevention, Control, and Countermeasures, and Pollution Prevention plans. Additionally, Fort Bliss has an Environmental Management System to monitor environmental compliance and waste reduction metrics and to provide data for adaptive management programs in the future. In the absence of sensitive air quality or noise receptors (e.g., schools, hospitals, residences, and non-commercial facilities) within a one-mile radius of the El Paso HCC aside from the WBAMC, no cumulative impacts on local air quality or noise are anticipated. The potential localized impacts to air quality during site development combined with the existing military land uses in the vicinity of the HCC are unlikely to result in cumulative air quality impacts. VA is also unaware of any sizable development projects in the area or on Fort Bliss within the reasonably foreseeable future.

VA contacted Texas Department of Transportation (TXDOT) El Paso District to review current and upcoming roadway improvement projects within the project vicinity. TXDOT confirmed that there are no roadway improvement projects currently under construction in the vicinity of the El Paso HCC site. TXDOT confirmed plans for improvements to Loop 375 (Purple Heart Memorial Highway) from Spur 601 (Liberty Expressway) to U.S. Highway 62/180 (Montana Avenue), located just east and adjacent to the El Paso HCC site. Loop 375 improvements are proposed for construction by 2022, and TXDOT determined there are no significant adverse effects associated with the Loop 375 improvements (TXDOT, 2018). Cumulative impacts to native vegetation communities would be negligible as a result of the proposed El Paso HCC site development when combined with the proposed Loop 375 improvements. Impacts to vegetation and potential habitat for wildlife can be minimized by limiting the amount of vegetation proposed for clearing, revegetating undeveloped areas with native species, and incorporating pollinator conservation and management into revegetation and maintenance plans to the extent practicable. Through TXDOT and VA consultation with Native American Tribes and THC prior to construction and the implementation of an inadvertent discovery plan during construction, cumulative impacts to cultural resources can also be minimized.

Additionally, VA is aware of and has considered two minor projects proposed to be located adjacent to the El Paso HCC site: the proposed construction and operation of an Intrepid Spirit Center and the proposed construction and operation of a new fire station. Intrepid Spirit Centers are approximately 25,000 square feet in size and provide treatment to military personnel suffering the effects of traumatic brain injury and post-traumatic stress. There are no proposed timelines for construction currently available to the public for the Intrepid Spirit Center or fire station; however, the construction and operation of these relatively small facilities is not anticipated to result in significant cumulative impacts to any of the environmental resource areas discussed in this EA for the El Paso HCC.

Beneficial cumulative impacts associated with the proposed action in conjunction with past, current, and future development include negligible short- and long-term increased job opportunities associated with construction and operation of the hospital facility, respectively. As such, a short- and long-term, minimally beneficial, cumulative impact to the local economy is anticipated from the proposed action.

3.16 Potential for Generating Substantial Controversy

VA solicited input from various federal, state, and local government agencies regarding the proposed action and received input from TPWD and THC. TPWD made several recommendations to minimize potential impacts on vegetation and wildlife habitat, migratory birds, state-listed species, and Species of Greatest Conservation Need. Fort Bliss DPW has not identified any eligible archeological sites in the area identified for the proposed project; however, THC did provide cultural resource information and stated that if eligible archeological sites were encountered during construction-related ground disturbance, additional consultation with THC would be required. At the time of scoping, utilities for the proposed HCC had not been definitively confirmed, and therefore, there has been additional ongoing correspondence with THC to complete Section 106 consultation for utility extensions both inside and beyond the proposed HCC site boundary.

Recommendations received from TPWD and THC were not presented as opposition to the proposed construction activities, and there does not appear to be substantial controversy regarding the project from TPWD. VA would incorporate TPWD recommendations into construction plans as applicable and would follow recommendations emerging from Section 106 consultation with THC.

4.0 Mitigation and Protection Measures

This section summarizes mitigation (if necessary) and protection measures, that are proposed to minimize and maintain potential adverse effects of the proposed action at acceptable, less-than-significant levels.

Per established protocols, procedures, and requirements, VA and its construction contractors would implement routine BMPs and would satisfy all applicable regulatory requirements in association with the proposed action. In general, implementation of such protection measures would maintain impacts at acceptable levels for all resource areas analyzed. These protection measures are different from mitigation measures, which are defined as project-specific requirements, not routinely implemented as part of development projects and are necessary to reduce identified potentially significant adverse environmental impacts to less-than-significant levels.

The routine BMPs which are likely to be implemented for the proposed action are summarized in Table 4-1. The regulatory requirements consistent with the project's federal status that are anticipated to apply to the proposed action, outlined in Section 3.0, are summarized in Table 4-2. For a list of permits which may apply to the proposed action, see Appendix A. There have been no mitigation measures identified as necessary to reduce identified potentially significant adverse environmental impacts for the proposed action.

Table 4-1. Best Management Practices and Protection Measures for the Proposed Action

Resource Area	Description
Aesthetics	Design new buildings to be architecturally and aesthetically consistent with the with surrounding developments, including the adjacent WBAMC.
Air Quality	Use modern construction equipment with emissions controls, and properly maintain construction equipment.
	Reduce idling of construction equipment and vehicles to minimize exhaust emissions.
	Use appropriate fugitive dust suppression measures during construction activity (e.g., watering exposed areas during dry periods, tracking control for construction equipment accessing the site, limiting grading during excessively windy days, and stockpile stabilization practices).
Geology and Soils/ Hydrology and Water Quality	Implementation of dust controls, wind fences, perimeter controls, and soil stabilization practices would reduce the potential for soil erosion.
Cultural	Create and implement a project-related inadvertent discovery plan outlining procedures on what to do and who to contact if there is an inadvertent discovery as a result of any project-related excavation, grading, or ground-disturbing activities.
Hydrology and Water Quality	Utilize engineered stormwater retention systems during operation to manage impacts from precipitation events.
	Implement groundwater engineering controls if groundwater is encountered during construction.

Wildlife and Habitat	Install sediment control fence prior to initial grading activities to exclude any wildlife from the construction area. The exclusion fence should be buried at least six inches and be at least 24 inches high.
	Limit vehicular speeds within the project area to a maximum of 15-miles per hour.
	Cover open trenches or excavation areas overnight and inspect every morning to ensure no wildlife species have been trapped.
	Incorporate dark-sky lighting practices into the final design for the VA HCC.
	Utilize mulch with a tackifier to promote revegetation of disturbed areas rather than matting to avoid entanglement hazards to wildlife.
	Use no-till drilling, hydro-mulching, and/or hydroseeding to reduce risk to wildlife.
	Avoid impacts to any burrows or other suitable habitat on the site, if feasible, and avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
	Minimize vegetation clearing to the greatest extent practical. Revegetate temporarily impacted areas with native species, while incorporating pollinator conservation and management and invasive species control measures into a revegetation and maintenance plan to the extent practicable.
	Limit vegetation clearing to exclude the general bird nesting season, March 15th through September 15th, to avoid adverse impacts to breeding birds. Perform active bird nest surveys prior to planned clearing or construction, and a minimum 150-foot buffer of vegetation should remain around any active nests that are observed prior to disturbance.
	Limit construction activities like clearing or grading during April and May and after October to reduce risk to reptiles.
	When designing roads or parking areas with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.
	Provide an environmental awareness training that addresses protected species and protection measures prior to construction and implement a “No Kill Wildlife Policy” during the construction and operation of the site.
	Follow appropriate protocol if wildlife is encountered, as outlined by TPWD. Any translocations of reptiles should be the minimum distance possible, no greater than one mile and preferably within 100 to 200 yards from the initial encounter location. Contractors should be informed to allow reptiles found on the project site to safely leave the project area.

	Conduct biological monitoring by a permitted biologist during active construction involving ground-disturbing activities. Request the most recent Texas Natural Diversity Database data on a regular basis and report all encounters of Species of Greatest Conservation Need.
Noise	Coordinate proposed construction activities in advance with any nearby sensitive receptors (e.g., WBAMC).
	Shut down noise-generating heavy equipment when it is not needed and maintain equipment per manufacturer's recommendations to minimize noise generation.
	Utilize broadband, self-adjusting backup alarms in lieu of backup-beepers consistent with applicable safety requirements and encourage construction personnel to operate equipment in the quietest manner practicable.
Socioeconomics	Secure the construction area to prevent unauthorized access to the property and to reduce the potential of health and safety risks.
	Implement BMPs during construction to minimize and control construction noise and fugitive dust, as discussed in other sections of this report, which would minimize adverse impacts to the surrounding populations.
Community Services	Coordinate any short-term road closures with the El Paso Police and Fire Department and the adjacent WBAMC to prevent significant disruption to their services.
Solid Waste and Hazardous Materials	Properly storage with appropriate labeling of petroleum products and hazardous materials in approved containers.
	Provide a secondary containment system around fuel storage containers and during refueling activities.
	Should a spill or release occur, any impacted soil would be effectively managed per applicable federal and state laws and regulations.
	Conduct sampling of the HCC development site to further characterize the site and identify any potential soil contaminants. If soil contamination is found, it would be remediated in accordance with all applicable regulations prior to vertical construction.
	Recycle or divert debris in accordance with Fort Bliss's construction and demolition debris diversion policy.

Table 4-2. Regulatory Requirements for the Proposed Action

Resource Area	Regulatory Requirement
Air Quality	Title V permit (update if necessary)
	USEPA's Mandatory GHG Reporting Rule
Geology and Soils/ Hydrology and Water Quality	Erosion and Sediment Control Plan (ESCP)* Stormwater Pollution Prevention Plan (SWPPP)*
Noise	Occupational Safety and Health Act standards (29 CFR 1926.52)
Solid Waste and Hazardous Materials	Spill Prevention Control & Countermeasure Plan (SPCCP)
Community Services	Coordination with the El Paso Police and Fire Department, Fort Bliss, and the adjacent WBAMC on any temporary road closures or traffic configurations.

* These regulatory requirements are part of the National Pollutant Discharge Elimination System (NPDES) 1200-C Construction Stormwater Permit and the Texas Commission on Environmental Quality (TCEQ) Construction General Permit (TXR150000).

5.0 Public Participation

VA invites public participation in decision-making on new proposals through the NEPA process. Public participation is guided by the VA NEPA regulations (38 CFR Part 26) and with additional guidance provided in VA's NEPA Interim Guidance for Projects. Agencies, organizations, and members of the public with a potential interest in the proposed action are encouraged to participate.

5.1 Agency Coordination

VA coordinated with agencies regarding the proposed construction of the new El Paso VA HCC. In July 2021, VA sent scoping letters to agencies, state, county, and municipal governments, including USEPA, U.S. Army Corps of Engineers, USDA, USFWS, NOAA, and TCEQ.

After surveying efforts conducted by the VA for proposed utility corridors, the THC concurred that construction and operation of the HCC would not affect any properties or archaeological sites eligible for listing in the NRHP (Appendix B).

The VA also requested early coordination with the TPWD and received recommendations to assist in project planning and compliance with state and federal laws. These recommendations are summarized in Table 4-1 and correspondence with TPWD is provided in Appendix B.

5.2 Native American Consultation

VA sent scoping letters and Section 106 consultation letters to federally-recognized Native American Tribes in the vicinity of the proposed El Paso VA HCC, including Apache Tribe of Oklahoma, Comanche Nation of Oklahoma, Fort Sill Apache Tribe of Oklahoma, Kiowa Tribe of Oklahoma, Mescalero Apache Tribe, Tonkawa Tribe of Indians of Oklahoma, White Mountain Apache Tribe, Wichita and affiliated Tribes of Oklahoma, and Ysleta del Sur Pueblo (Tugua). The Tribes did not respond to the scoping letters or submit scoping comments. Any comments received from Section 106 consultation will be included in the Final EA.

5.3 Scoping

VA provided federal, state, and local agencies; the public; and potentially affected parties with an opportunity to participate in scoping. Scoping is a tool for identifying the issues that should be addressed during the NEPA and NHPA compliance processes. Scoping allows the agencies, public, and stakeholders to help define priorities and express stakeholder and community issues to the agency through oral and written comments.

VA published a notice of scoping on July 4, 2021 and July 7, 2021, in El Paso Times newspaper. The notice described the proposed action and solicited public comments with a deadline of August 3, 2021.

VA mailed scoping letters to federal, state, and local agencies; public officials; federally recognized Tribes; and special interest groups. Similar to the notices published in the newspaper, the letters included information on the proposed action, the comment period, and instruction on submitting comments.

During the public scoping period, VA received three written comments (refer to Appendix B).

5.4 Public Review

As part of NEPA compliance, the VA published and distributed the Draft EA for a 30-day public comment period as announced by a Notice of Availability published in the El Paso Times on June 10, 2022, and June 12, 2022. The 30-day public comment period began on the first publication date of the public notice. Review copies of the Draft EA were made available online at

https://www.cfm.va.gov/environmental/index.asp and behind the reference desk at the Esperanza Acosta Moreno Library in El Paso, Texas. VA received one letter of concurrence from the White Mountain Apache Tribe that the proposed action would have no adverse effects to the tribe's cultural heritage resources and historical properties and one letter form TPWD with comments on the Draft EA. TPWD's comments have been addressed in this Final EA.

6.0 Agencies and Persons Consulted

Affiliation	Contact	Address	Email and Phone Number
Federal Agencies			
U.S. Fish and Wildlife Service	Amy Lueders, Regional Director	500 Gold Avenue SW Albuquerque, NM 87102	RDLueders@fws.gov 505-248-6911
U.S. Fish hand Wildlife Service	Adam Zerrenner, Field Supervisor	10711 Burnet Road, Suite 200, Austin, TX 78758	adam_zerrenner@fws.gov 512-490-0057
US Army Corps of Engineers	Sabrina Sparkman, USACE Project Manager	819 Taylor Street Fort Worth, TX 76102	sabrina.sparkman@usace.army.mil 817-886-1498
U.S. Environmental Protection Agency, Region 6	David Gray, Acting Regional Administrator	1201 Elm Street Dallas, TX 75270	gray.david@epa.gov 214-665-8120
Fort Bliss Department of Public Works Environmental Division, Conservation Branch	Martha Yduarte, CRM Archaeologist/ Curator	624 Pleasonton Road, Room 106, USAG Fort Bliss, TX 79916	martha.yduarte.civ@mail.mil 915-568-7015
Fort Bliss Department of Public Works Environmental Division, Conservation Branch	Fabiola Silva, M.A., CRM Archaeologist	624 Pleasonton Road, Room 106, USAG Fort Bliss, TX 79916	fabiola.e.silva.civ@mail.mil 915-568-2707 575-520-3074
Fort Bliss Department of Public Works Environmental Division, Conservation Branch	Christopher A. Taylor, Wildlife Biologist	624 Pleasonton Road, Room 106, USAG Fort Bliss, TX 79916	christopher.a.taylor154.civ@mail.mil 915-568-3016
State Agencies			
Texas Department of Transportation	Aracely Olmos, Right of Way Agent	13301 Gateway Boulevard West El Paso, TX 79928	Aracely.Olmos@txdot.gov
Texas Historical Commission	Mark Wolfe, Executive Director	P.O. Box 12276 Austin, TX 78711-2276	mark.wolfe@thc.texas.gov 512-936-4323

Affiliation	Contact	Address	Email and Phone Number
Texas Historical Commission	Pam Opiela, State Historic Preservation Officer Reviewer	108 W 16th Street Austin, TX 78701	pamela.opiela@thc.texas.gov 512-463-8952
Texas Historical Commission	Joseph Bell, Deputy Executive Director	P.O. Box 12276, 1511 Colorado Street Austin, TX 78701	Joseph.Bell@thc.texas.gov 512-463-8801
Texas Parks and Wildlife Department	Laura Zebehazy, Wildlife Habitat Assessment Program Leader	4200 Smith School Road Austin, TX 78744	laura.zebehazy@tpws.texas.gov 512-389-4802
Texas Parks and Wildlife Department	Jessica Schmerler, Habitat Assessment Biologist	4200 Smith School Road Austin, TX 78744	WHAB@tpwd.texas.gov
Texas Historical Commission	Greg Smith, Federal Programs Coordinator		greg.smith@thc.texas.gov 512-463-6013
Local Agencies			
City of El Paso	Oscar Leeser, Mayor	300 N. Campbell Street El Paso, TX 79901	mayor@elpasotexas.gov 915-212-0000
City of El Paso	Tommy Gonzalez, City Manager	300 N. Campbell Street El Paso, TX 79901	tgonzalez@elpasotexas.gov 915-212-0023
City of El Paso	Jerry DeMuro, Assistant Director of Design	218 N. Campbell Street El Paso, TX 79901	DeMuroG@elpasotexas.gov 915-212-1838
Elected Officials			
U.S. House of Representatives 16th District	Veronica Escobar	1505 Longworth House Office Building Washington, DC 20515	veronica.escobar@mail.house.gov
U.S. Senate	Senator John Cornyn	517 Hart Senate Office Building Washington, DC 20510	west_texas@cornyn.senate.gov
U.S. Senate	Senator Ted Cruz	127A Russell Washington, DC 20510	west_texas@cruz.senate.gov
Texas State House of Representatives District 79	Art Fierro	P.O. Box 2910, Room E2.412, Austin, TX 78768	Art.Fierro@house.texas.gov
Texas State Senate District 29	Senator César Blanco	P.O. Box 12068 Capitol Station Austin, TX 78711	Cesar.Blanco@senate.texas.gov

Affiliation	Contact	Address	Email and Phone Number
Tribes			
Apache Tribe of Oklahoma	Darrin Cisco, Tribal Historic Preservation Officer	510 E Colorado Drive Andarko, OK 73005	Apacheculture510@yahoo.com 405-247-7494
Apache Tribe of Oklahoma	Bobby Komardley, Chairman	P.O. Box 1330 Andarko, OK 73005	bkomardley@outlook.com 405-247-9493
Comanche Nation of Oklahoma	William Nelson, Chairman	P.O. Box 908 Lawton, OK 73502	williamn@comanchenation.com 580-492-3240
Comanche Nation of Oklahoma	Martina Minthorn, Tribal Historic Preservation Officer	P.O. Box 908 Lawton, OK 73502	martina.minthron@comanchenation.com 580-595-9618
Fort Sill Apache Tribe of Oklahoma	Michael Darrow, Tribal Historian	43187 U.S. Highway 281 Apache, OK 73006	michael.darrow@fortsillapache-nsn.gov 580-588-2298
Fort Sill Apache Tribe of Oklahoma	Lori Gooday Ware, Tribal Chairwoman	43187 U.S. Highway 281 Apache, OK 73006	lori.g.ware@fortsillapache-nsn.gov 580-558-2298
Kiowa Tribe of Oklahoma	Matthew Komalty, Chairman	P.O. Box 369 Carnegie, OK 73015	chill@kiowatribe.org 580-654-2300
Kiowa Tribe of Oklahoma	Kellie Lewis, Section 106 and Native American Graves Protection and Repatriation Act Coordinator	100 Kiowa Way Carnegie, OK 73015	kellie@tribaladminservices.org
Mescalero Apache Tribe	Danny H. Breuninger, Sr., Tribal President	P.O. Box 227 Mescalero, NM 88340	dbreuninger@mescaleroapachetribe.com 575-464-4494
Mescalero Apache Tribe	Holly Houghten, Tribal Historic Preservation Officer	P.O. Box 227 Mescalero, NM 88340	Holly@mathpo.org 575-464-3005
Tonkawa Tribe of Indians of Oklahoma	Russell Martin, President	1 Rush Buffalo Road Tonkawa, OK 74653	rmartin@tonkawatribe.com 580-628-2561
Tonkawa Tribe of Indians of Oklahoma	Lauren Brown, Native American Graves Protection and Repatriation Act Coordinator	1 Rush Buffalo Road Tonkawa, OK 74653	lbrown@tonkawatribe.com 580-628-2561
White Mountain Apache Tribe	Gwendena Lee-Gatewood, Chairwoman	P.O. Box 700 Whiteriver, AZ 85941	gwendena@wmat.us 928-338-4346

Affiliation	Contact	Address	Email and Phone Number
White Mountain Apache Tribe	Mark Altaha, Tribal Historic Preservation Officer	P.O. Box 1032 Fort Apache, AZ 85926	markaltaha@wmat.us 928-338-3033
Wichita and Affiliated Tribes (Wichita, Keechi, Waco & Tawakonie), Oklahoma	Gary McAdams, Tribal Historic Preservation Officer	P.O. Box 729 Anadarko, OK 73005	gary.mcadams@wichitatribe.com 405-247-8695 ext. 200
Ysleta del Sur Pueblo (Tugua)	Michael Silvas, Governor	119 South Old Pueblo Road El Paso, TX 79917	tribalcouncil@ydsp-nsn.gov 915-859-8053
Ysleta del Sur Pueblo (Tugua)	Rick Quezada, Director of Cultural Preservation	119 South Old Pueblo Road El Paso, TX 79917	rquezada@ydsp-nsn.gov 915-955-7732
Local Community			
El Paso County Historical Commission	Barbara Welch, Chair	500 East Overland Avenue El Paso, TX 79901	obscuredjinn@gmail.com
El Paso Historical Society	Melissa Hutson, President	603 West Yandell Street El Paso, TX 79902	info@elpasohistory.com
Preservation Texas	Evan Thompson, Executive Director	1204 San Antonio Street, Suite 204, Austin, TX 78701	thompson@preservationtexas.org
El Paso Preservation Alliance	Ricardo Gonzalez, President	2734 Silver Avenue El Paso, TX 79930	rdgonzz@gmail.com 915-274-1079
El Paso Historic Landmark Commission	Providencia Velazquez, Historic Preservation Officer	801 Texas Avenue El Paso, TX 79901	velazquezpx@elpasotexas.gov 915-212-1567
Internal			
Fort Bliss Garrison	Major General Sean C. Bernabe, Commanding General 1AD	0001 AR CO HQ AND SPT Fort Bliss, TX 79916	sean.c.bernabe.mil@mail.mil 915-744-1605
Fort Bliss Garrison	Colonel James A. Brady, Garrison Commander	1741 Marshall Road Fort Bliss, TX 79916	
Fort Bliss Directorate of Public Works	Al Riera, Director	777 Pleasonton Road Fort Bliss, TX 79916	alfredo.j.riera.civ@mail.mil 915-568-6200
Fort Bliss Directorate of Public Works	Joseph A. Ranson, Environmental Branch Chief	624 Pleasonton Road USAG Fort Bliss, TX 79916	joseph.a.ranson.civ@mail.mil 915-568-7031

Affiliation	Contact	Address	Email and Phone Number
Environmental Division			
Fort Bliss Directorate of Public Works Environmental Division	Yvette M. Waychus, Compliance Branch Chief	622 Pleasonton Road USAG Fort Bliss, TX 79916	yvette.m.waychus.civ@usa.army.mil 915-568-2774
Fort Bliss Directorate of Public Works Environmental Division	Shane Offutt, Conservation Branch Chief	624 Pleasonton Road, Room 140, USAG Fort Bliss, TX 79916	shane.p.offutt2.civ@mail.mil 915-568-0384
William Beaumont Army Medical Center	Colonel Michael S. Oshiki, Commander	5005 N. Piedras Street El Paso, TX 79920	michael.s.oshiki.mil@usa.army.mil 915-742-2201
Fort Bliss Public Affairs Office	Guy Volb, Supervisory Public Affairs Specialist	Public Affairs Office Building 15 Slater Road USAG Fort Bliss, TX 79916	guy.a.volb.civ@mail.mil 915-568-4505

7.0 List of Preparers

7.1 Department of Veterans Affairs Staff

Mr. Patrick Read
Environmental Engineer
Construction & Facilities Management
U.S. Department of Veterans Affairs

Mr. Bruce Mack
Environmental Engineer
Construction & Facilities Management
U.S. Department of Veterans Affairs

Mr. Héctor M. Abreu-Cintrón
Federal Preservation Officer
Construction & Facilities Management
U.S. Department of Veterans Affairs

7.2 LRS Federal (Consultants)

Name	Role	Degree	Years of Experience
Jesse Byrd	NEPA Specialist/Program Manager	BA, Environmental Studies	16
Sara Schulkowski	Environmental Engineer	MS, Environmental Resources Engineering BS, Environmental Science and Technology	2

8.0 References

CEQ. (2012, March 6). Improving the Process for Preparing Efficient and Timely Environmental Reviews uner the National Environmental Policy Act. Washington, DC. Retrieved June 2020, from https://ceq.doe.gov/docs/ceq-regulations-and-guidance/Improving_NEPA_Efficiencies_06Mar2012.pdf

City of El Paso Planning Department. (n.d.). Zoning. El Paso, TX. Retrieved July 12, 2021, from http://gis.elpasotexas.gov/planning/index.html

EPA. (2020). EJSCREEN. Retrieved July 13, 2021, from https://ejscreen.epa.gov/mapper/

FEMA. (n.d.). FEMA Flood Map Service Center. Retrieved July 8, 2021, from https://msc.fema.gov/portal/home

Fort Bliss Directorate of Public Works. (2017-2021). *Fort Bliss Integrated Cultural Resources Management Plan.*

Fort Bliss Environmental Division. (2022). Environmental Review Form.

LRS Federal LLC. (2021, September). Water Capacity and Consumption Analysis Report.

LRS Federal LLC via CobbFendley. (2021, July). Fort Bliss Veterans Affairs Health Care Center Traffic Impact Analysis.

RLF. (2021). Program Requirements Document.

SWCA Environmental Consultants. (2022, February). An Intensive Archaeological Survey for the Powerline Associated with a VA Healthcare Center at Fort Bliss in El Paso County, Texas.

SWCA Environmental Consultants. (2022, January). Biological Survey Report for the Fort Bliss VA Healthcare Center Powerline Project, El Paso County, Texas.

Texas Historical Commission. (2022, February 7). Project Review Under Section 106 of the National Historic Preservation Act.

Texas Parks and Wildlife. (2021, June 22). Rare, Threatened, and Endangered Species of Texas. Retrieved July 9, 2021, from https://tpwd.texas.gov/gis/rtest/

U.S. Department of Veterans Affairs. (2021, March). *National Center for Veterans Analysis and Statistics.* Retrieved March 2021, from Veteran Population by County: https://www.va.gov/vetdata/Veteran_Population.asp

United States Census Bureau. (n.d.). Retrieved July 13, 2021, from https://data.census.gov/cedsci/

USDA. (n.d.). Farmland Protection Policy Act. Retrieved from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/?cid=nrcs143_008275

USDA NRCS. (2019, July 31). Web Soil Survey. Retrieved July 7, 2021, from https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

USEPA. (2021, June 30). Nonattainment Areas for Criteria Pollutants (Green Book). Washington, D.C. Retrieved July 7, 2021, from https://www.epa.gov/green-book

USFWSa. (n.d.). IPaC Information for Planning and Consultation. Retrieved July 6, 2022, from https://ecos.fws.gov/ipac/

USFWSb. (n.d.). National Wetlands Inventory. Retrieved July 8, 2021, from https://www.fws.gov/wetlands/data/Mapper.html

USGSa. (2014). 2014 Seismic Hazard Map- Texas. Retrieved July 8, 2021, from https://www.usgs.gov/media/images/2014-seismic-hazard-map-texas

USGSb. (n.d.). Mineral Resources Online Spatial Data. Retrieved July 7, 2021, from https://mrdata.usgs.gov/

USGSc. (n.d.). National Water Information System: Mapper. Retrieved July 8, 2021, from https://maps.waterdata.usgs.gov/mapper/index.html

9.0 Glossary

Aesthetics—Pertaining to the quality of human perception of natural beauty.

Ambient—The environment as it exists around people, plants, and structures.

Ambient Air Quality Standards—Those standards established according to the Clean Air Act to protect health and welfare.

Aquifer—An underground geological formation containing usable amounts of groundwater that can supply wells and springs.

Attainment area—Region that meets the National Ambient Air Quality Standard (NAAQS) for a criteria pollutant under the Clean Air Act.

Best management practices (BMPs)—Methods, measures, or practices to prevent or reduce environmental impacts.

Contaminants—Any physical, chemical, biological or radiological substances that have an adverse effect on air, water, or soil.

Council on Environmental Quality (CEQ)—An agency in the Executive Office of the President composed of three members appointed by the President, subject to approval by the Senate. Each member shall be exceptionally qualified to analyze and interpret environmental trends, and to appraise programs and activities of the federal government. Members are to be conscious of and responsive to the scientific, economic, social, aesthetic, and cultural needs of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment. Develop and issue guidance for implementing the National Environmental Policy Act.

Cultural resources—The physical evidence of our Nation's heritage. Includes archaeological sites; historic buildings, structures, and districts; and localities with social significance to the human community.

Direct impact—A direct impact is caused by a proposed action and occurs at the same time and place.

Emission—A release of a pollutant.

Endangered species—Any species which is in danger of extinction throughout all or a significant portion of its range.

Environmental assessment (EA)—An EA is a publication that provides sufficient evidence and analyses to show whether a proposed system will adversely affect the environment or be environmentally controversial.

Erosion—The wearing away of the land surface by detachment and movement of soil and rock fragments through the action of moving water and geological agents.

Floodplain—The relatively flat area or lowlands adjoining a river, stream, ocean, lake, or other body of water that is susceptible to being inundated by floodwaters.

Fugitive dust—Particles light enough to be suspended in air, but not captured by a filtering system. For this document, this refers to particles put in the air by moving vehicles and air movement over disturbed soils at construction sites.

Geology—Science which deals with the physical history of the earth, the rocks of which it is composed, and physical changes in the earth.

Groundwater—Water found below the ground surface. Groundwater may be geologic in origin and as pristine as it was when it was entrapped by the surrounding rock or it may be subject to daily or seasonal

effects depending on the local hydrologic cycle. Groundwater may be pumped from wells and used for drinking water, irrigation, and other purposes. It is recharged by precipitation or irrigation water soaking into the ground. Thus, any contaminant in precipitation or irrigation water may be carried into groundwater.

Hazardous materials—Defined within several laws and regulations to have certain meanings. For this document, a hazardous material is any one of the following:

> Any substance designated pursuant to section 311 (b)(2)(A) of the Clean Water Act.
>
> Any element, compound, mixture, solution, or substance designated pursuant to Section 102 of Comprehensive Environmental Response, Compensation and Liability (CERCLA).
>
> Any hazardous substance as defined under the Resource Conservation and Recovery Act (RCRA).
>
> Any toxic pollutant listed under TSCA.
>
> Any hazardous air pollutant listed under Section 112 of the Clean Air Act.
>
> Any imminently hazardous chemical substance or mixture with respect to which the EPA Administrator has taken action pursuant to Subsection 7 of TSCA.
>
> The term does not include: 1) Petroleum, including crude oil or any thereof, which is not otherwise specifically listed or designated as a hazardous substance in a above. 2) Natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas). A list of hazardous substances is found in CFR 302.4.

Indirect impact—An indirect impact occurs later in time or farther removed in distance from the action causing it but is still reasonably foreseeable. Indirect impacts may include induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural and social systems.

Jurisdictional wetland—Areas that meet the wetland hydrology, vegetation, and hydric soil characteristics, and have a direct connection to the Waters of the U.S. These wetlands are regulated by the USACE.

Listed species—Any plant or animal designated by a state or the federal government as a threatened, endangered, special concern, or candidate species.

Mitigation—Measures taken to reduce adverse impacts on the environment.

National Ambient Air Quality Standards (NAAQS)—Nationwide standards set up by the USEPA for widespread air pollutants, as required by Section 109 of the Clean Air Act. Currently, six pollutants are regulated by primary and secondary NAAQS: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.

Non-attainment area—An area that has been designated by the EPA or the appropriate State air quality agency as exceeding one or more national or state ambient air quality standards.

Parcel—A plot of land, usually a division of a larger area.

Particulates or particulate matter—Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog found in air.

Physiographic region—A portion of the Earth's surface with a basically common topography and common morphology.

Remediation—An action that reduces or eliminates a threat to the environment; often used to refer to "clean up" of chemical contamination in soil or water.

Sensitive receptors—Include, but are not limited to children, and the elderly, as well as specific facilities, such as long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, and childcare centers.

Significant impact—According to 40 CFR 1508.27, "significance" as used in NEPA requires consideration of both context and intensity.

> Context. The significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.
>
> Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

Soil—The mixture of altered mineral and organic material at the earth's surface that supports plant life.

Solid waste—Any discarded material that is not excluded by section 261.4(a) or that is not excluded by variance granted under sections 260.30 and 260.31.

Threatened species—Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Topography—The relief features or surface configuration of an area.

Waters of the United States—Include the following: territorial seas and traditional navigable waters; tributaries; lakes, ponds, and impoundments of jurisdictional waters; and adjacent wetlands.

Watershed—The region draining into a particular stream, river, or entire river system.

Wetlands—Areas that are regularly saturated by surface or groundwater and, thus, are characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Examples include swamps, bogs, fens, marshes, and estuaries.

Wildlife habitat—Set of living communities in which a wildlife population lives.

A Appendix A: Permits

In addition to the regulatory framework of NEPA, the CEQ Regulations Implementing the Procedural Provisions of NEPA, VA's NEPA regulations (38 CFR Part 26), and VA's NEPA Interim Guidance for Projects, the following federal, state, and/or local environmental permits are anticipated as part of the proposed action.

- National Pollutant Discharge Elimination System (NPDES) 1200-C Construction Stormwater Permit
- Texas Commission on Environmental Quality Construction General Permit (TXR150000)
- Texas Commission on Environmental Quality Title V Air Operating Permit

B Appendix B: Agency Correspondence

B.1 Stakeholder Scoping Notice

B.2 Proof of Publication for Scoping Notice

B.3 Texas Parks and Wildlife Department Correspondence

B.4 Texas Historical Commission Correspondence

B.1 Stakeholder Scoping Notice

U.S. DEPARTMENT OF VETERANS AFFAIRS
OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT

NOTICE OF SCOPING AND PUBLIC INVOLVEMENT UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT FOR THE PROPOSED HEALTH CARE CENTER AT FORT BLISS, TEXAS

The U.S. Department of Veterans Affairs (VA) Office of Construction and Facilities Management and U.S. Army Garrison, Fort Bliss are gathering information to assist with the preparation of an Environmental Assessment (EA) as part of the Federal decision-making process for the proposed design, construction, and operation of a new health care center (HCC) located on Fort Bliss in El Paso, Texas. The proposed facility would consist of an approximately 500,000-square-foot VA constructed and operated health care center with approximately 1,500 surface parking spaces and would be located on approximately 30-acres adjacent to the new William Beaumont Army Medical Center on the Fort Bliss garrison. The project will also include temporary construction support areas and utility improvements both inside and outside the Fort Bliss cantonment to accommodate the facility.

In accordance with the National Environmental Policy Act (NEPA), the VA and Army are seeking the public's input on issues to be addressed during the NEPA process, including environmental concerns that may occur as a result of the proposed Federal action.

A public scoping period is open through **August 3, 2021**. During this time, the public is invited to submit comments on the proposed action and identify potential issues or concerns for consideration in the NEPA process. Due to the on-going COVID 19 pandemic all submissions should be sent/made via email to vacoenvironment@va.gov with the subject line "Fort Bliss HCC NEPA Scoping.

If including your address, phone number, e-mail address, or other personally identifiable information in your comment, please be aware that your entire comment – including your personal identifiable information – may be made publicly available at any time. While you can ask us in your comment to withhold your personally identifiable information from public review, we cannot guarantee that we will be able to do so.

DEPARTMENT OF VETERANS AFFAIRS
Office of Construction & Facilities Management
Washington DC 20420

Date: July 1, 2021

To: Valued Stakeholders

Subject: Notice of Scoping and Stakeholder Involvement for the Proposed Health Care Clinic at Fort Bliss, Texas

The U.S. Department of Veterans Affairs (VA) Office of Construction and Facilities Management and the U.S Army Garrison, Fort Bliss are gathering information to assist with the preparation of an Environmental Assessment (EA) as part of the Federal decision-making process for the proposed design, construction, and operation of a new health care center (HCC) located on Fort Bliss, Texas. The proposed facility would consist of an approximately 500,000-square-foot VA constructed and operated health care center with approximately 1,500 surface parking spaces and would be located on approximately 30-acres adjacent to the new William Beaumont Army Medical Center on the Fort Bliss garrison. This area is labeled 'Area of Consideration' on Figure 1. The project will also include temporary construction support areas and utility improvements both inside and outside the Fort Bliss cantonment to accommodate the facility.

As part of the decision-making process, VA will undertake an environmental impact analysis of the proposed action in compliance with the requirements of the National Environmental Policy Act (NEPA). The VA and Army are seeking input as part of the scoping process on issues to be addressed during the NEPA process, including environmental concerns. VA will be initiating consultation under Section 106 of the National Historic Preservation Act, 54 U.S.C. 306108 at a future date. VA will be consulting with the State Historic Preservation Office, Tribes, and other consulting parties to identify historic properties that may potentially be affected by the undertaking and to seek ways to avoid, minimize or mitigate for potential adverse effects.

NEPA requires that a Federal agency provide the public with an opportunity to participate in the process of analyzing the impact of Federal actions on the human environment. The purpose of this letter is to notify members of the community and other stakeholders of this opportunity to assist the VA and Army in identifying issues, including environmental concerns that may occur as a result of the proposed Federal action.

A public scoping comment period will be open through **Tuesday, August 3, 2021**. During this time, agencies and stakeholders are encouraged to submit written comments and input on theproposed action in order to help identify potential issues or concerns for consideration in the NEPA process. Submissions received during the scoping period will be considered in the NEPA compliance process.

Due to the on-going COVID-19 pandemic, all submissions should be sent/made via email to vacoenvironment@va.gov with the subject line “Fort Bliss HCC NEPA Scoping.” The point of contact for this proposed action is Mr. Bruce Mack, telephone number (224) 610-7337.

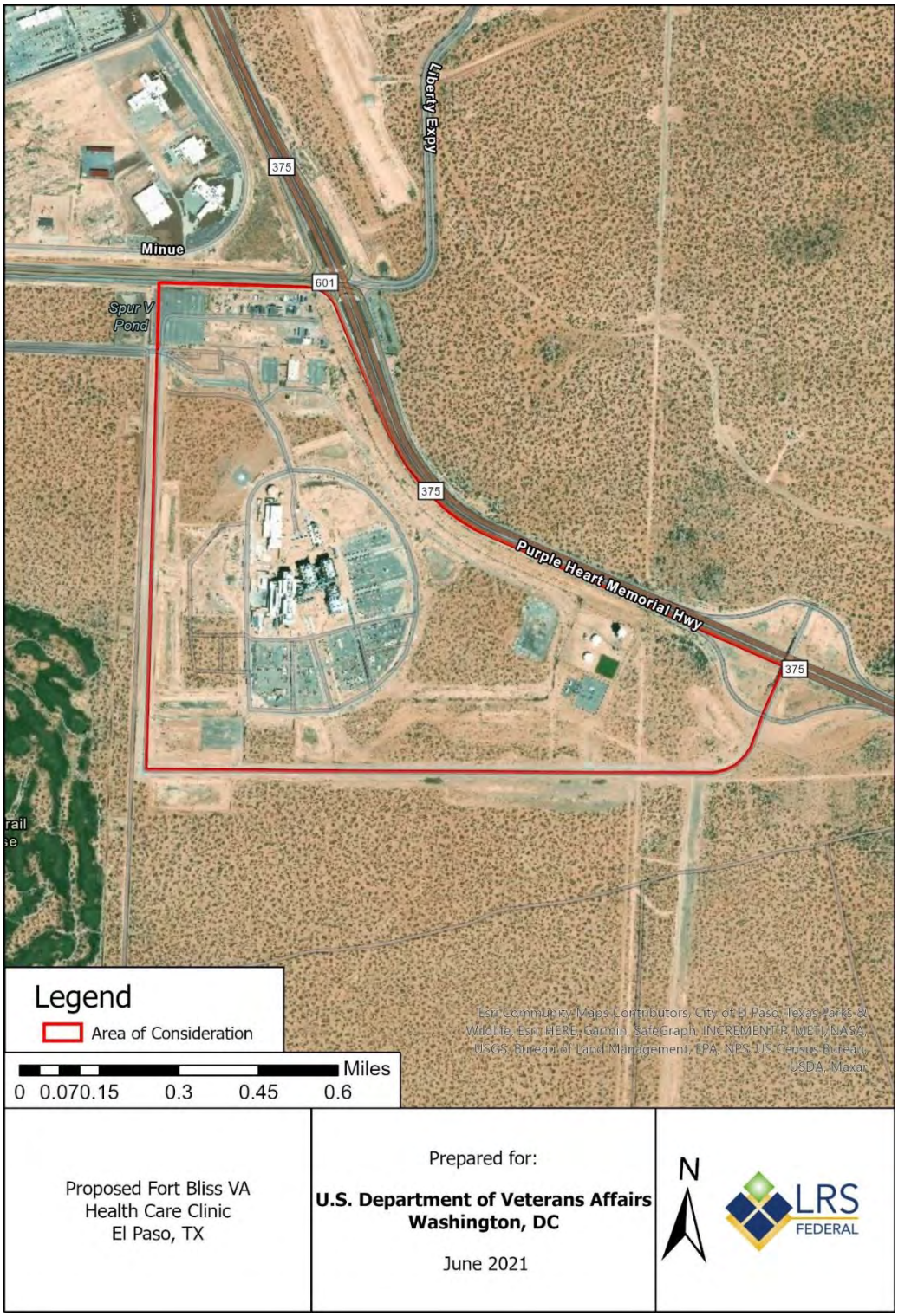


Figure 1. Area of Consideration for the Fort Bliss Health Care Center

B.2 Proof of Publication for Scoping Notice

El Paso Times
PART OF THE USA TODAY NETWORK

Affidavit of Publication

Ad # 0004802194

This is not an invoice

LRS FEDERAL LLC
8221 RITCHIE HWY SUITE 300

PASADENA, MD 21122

I, being duly sworn say: **El Paso Times**, a daily newspaper of general circulation published in the City and County El Paso, State of Texas, which is a newspaper of general circulation and which has been continuously and regularly published for the period of not less than one year in the said County of El Paso, and that he/she was upon the dates herein mentioned in the EL PASO TIMES.

That the LEGAL copy was published in the EL PASO TIMES for the date(s) of such follows DAY(s) to wit

07/04/2021, 07/07/2021

Legal Clerk

Subscribed and sworn before me this July 7, 2021

State of WI, County of Brown
NOTARY PUBLIC

1-7-25
My commission expires

KATHLEEN ALLEN
Notary Public
State of Wisconsin

Ad # 0004802194
PO #:
# of Affidavits 1

This is not an invoice

U.S. DEPARTMENT OF VETERANS AFFAIRS
OFFICE OF CONSTRUCTION AND FACILITIES MANAGEMENT
NOTICE OF SCOPING AND PUBLIC INVOLVEMENT
UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT
FOR THE PROPOSED
HEALTH CARE CENTER AT FORT BLISS, TEXAS

The U.S. Department of Veterans Affairs (VA) Office of Construction and Facilities Management and U.S. Army Garrison, Fort Bliss are gathering information to assist with the preparation of an Environmental Assessment (EA) as part of the Federal decision-making process for the proposed design, construction, and operation of a new health care center (HCC) located on Fort Bliss in El Paso, Texas. The proposed facility would consist of an approximately 500,000-square-foot VA constructed and operated health care center with approximately 1,500 surface parking spaces and would be located on approximately 30-acres adjacent to the new William Beaumont Army Medical Center on the Fort Bliss garrison. The project will also include temporary construction support areas and utility improvements both inside and outside the Fort Bliss cantonment to accommodate the facility.

In accordance with the National Environmental Policy Act (NEPA), the VA and Army are seeking the public's input on issues to be addressed during the NEPA process, including environmental concerns that may occur as a result of the proposed Federal action.

A public scoping period is open through August 3, 2021. During this time, the public is invited to submit comments on the proposed action and identify potential issues or concerns for consideration in the NEPA process. Due to the on-going COVID 19 pandemic all submissions should be sent/made via email to vacoenvironment@va.gov with the subject line "Fort Bliss HCC NEPA Scoping.

If including your address, phone number, e-mail address, or other personally identifiable information in your comment, please be aware that your entire comment – including your personal identifiable information – may be made publicly available at any time. While you can ask us in your comment to withhold your personally identifiable information from public review, we cannot guarantee that we will be able to do so

#4802194 El Paso Times, July 4, 7, 2021

B.3 Texas Parks and Wildlife Department Correspondence

TEXAS PARKS & WILDLIFE

Life's better outside.

Commissioners

Arch "Beaver" Aplin, III
Chairman
Lake Jackson

James E. Abell
Kilgore

Oliver J. Bell
Cleveland

Paul L. Foster
El Paso

Anna B. Galo
Laredo

Jeffery D. Hildebrand
Houston

Robert L. "Bobby" Patton, Jr.
Fort Worth

Travis B. "Blake" Rowling
Dallas

Dick Scott
Wimberley

Lee M. Bass
Chairman-Emeritus
Fort Worth

T. Dan Friedkin
Chairman-Emeritus
Houston

Carter P. Smith
Executive Director

August 3, 2021

Mr. Bruce Mack
Department of Veterans Affairs
Office of Construction & Facilities Management
Washington, DC 20420

RE: Proposed Health Care Clinic at Fort Bliss, El Paso County, Texas

Dear Mr. Mack:

Texas Parks and Wildlife Department (TPWD) has received the request for coordination regarding the proposed project referenced above located within Fort Bliss in El Paso County. TPWD staff has reviewed the information provided and offers the following information, comments, and recommendations concerning this project.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see the Texas Parks and Wildlife Code, Section 12.0011. For tracking purposes, please refer to TPWD project number 46875 in any return correspondence regarding this project.

Project Description

The information provided included the following project description:

"The U.S. Department of Veterans Affairs (VA) Office of Construction and Facilities Management and the U.S Army Garrison, Fort Bliss are gathering information to assist with the preparation of an Environmental Assessment (EA) as part of the Federal decision-making process for the proposed design, construction, and operation of a new health care center (HCC) located on Fort Bliss, Texas. The proposed facility would consist of an approximately 500,000-square-foot VA constructed and operated health care center with approximately 1,500 surface parking spaces and would be located on approximately 30-acres adjacent to the new William Beaumont Army Medical Center on the Fort Bliss garrison. The project will also include temporary construction support areas and utility improvements both inside and outside the Fort Bliss cantonment to accommodate the facility."

General Construction Recommendations

TPWD would like to provide the following general construction recommendations to assist in project planning.

Recommendation: TPWD recommends the judicious use and placement of sediment control fence to exclude wildlife from the construction area. In many

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.texas.gov

cases, sediment control fence placement for the purposes of controlling erosion and protecting water quality can be modified minimally to also provide the benefit of excluding wildlife access to construction areas. The exclusion fence should be buried at least six inches and be at least 24 inches high. The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated with site-specific native species. Construction personnel should be encouraged to examine the inside of the exclusion area daily to determine if any wildlife species have been trapped inside the area of impact and provide safe egress opportunities prior to initiation of construction activities. TPWD recommends that any open trenches or excavation areas be covered overnight and/or inspected every morning to ensure no wildlife species have been trapped. For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Also, inspect excavation areas for trapped wildlife prior to refilling.

Recommendation: For soil stabilization and/or revegetation of disturbed areas within the proposed project area, TPWD recommends erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. Because the mesh found in many erosion control blankets or mats pose an entanglement hazard to wildlife, TPWD recommends the use of no-till drilling, hydromulching and/or hydroseeding due to a reduced risk to wildlife. If erosion control blankets or mats will be used, the product should not contain netting, but if it must contain netting it should contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. TPWD recommends avoiding the use of plastic mesh matting.

Impacts to Vegetation/Wildlife Habitat

TPWD would like to provide the following vegetation removal, revegetation, and landscaping recommendations to assist in project planning.

Recommendation: TPWD recommends reducing the amount of vegetation proposed for clearing if possible and minimizing clearing of native vegetation, particularly mature native trees (if present), riparian vegetation, and shrubs to the greatest extent practicable. TPWD recommends in-kind on-site replacement/restoration of the native vegetation wherever practicable. Colonization by invasive species, particularly invasive grasses and weeds, should be actively prevented. Vegetation management should include removing invasive species early on while allowing the existing native plants to revegetate the disturbed areas. TPWD recommends referring to the Lady Bird Johnson Wildflower Center Native Plant Database for regionally adapted native species that would be appropriate for landscaping and revegetation.

Landscaping for Monarch Butterflies

In December 2020, the U.S. Fish and Wildlife Service (USFWS) determined that Endangered Species Act (ESA) listing for the monarch butterfly (*Danaus plexippus*) was warranted; however, listing was precluded by higher priority listing actions. Currently, the monarch butterfly is a candidate for listing and USFWS will review the species status annually until a proposal for listing is developed.

Significant declines in the population of migrating monarch butterflies have led to widespread concern about this species and the long-term persistence of the North American monarch migration. As part of an international conservation effort TPWD has developed the *Texas Monarch and Native Pollinator Conservation Plan*, and one of the broad categories of action in this plan is to augment larval feeding and adult nectaring opportunities.

Recommendation: TPWD recommends incorporating pollinator conservation and management into the revegetation and maintenance plan for this project, such as promoting growth of native flowering species throughout the growing season. TPWD recommends revegetation efforts include planting or seeding native milkweed (*Asclepias* spp.) and nectar plants as funding and seed availability allow. Information about monarch biology, migration, and butterfly gardening can be found on the Monarch Watch website.

Recommendation: TPWD advises against planting the non-native milkweed species black swallow-wort (*Cynanchum louiseae*) and pale swallow-wort (*C. rossicum*). Monarch butterflies will lay eggs on these plant species, but the larvae are unable to feed and complete their life cycle. Additionally, these plant species can be highly invasive. TPWD also advises against planting the non-native tropical milkweed (*Asclepias curassavica*), a popular commercial nursery milkweed that can persist year-round in southern states. The year-round persistence of tropical milkweed fosters greater transmission of the protozoan *Ophryocystis elektroscirrha* (OE), increasing the likelihood that monarchs become infected with the debilitating parasite.

Facility Lighting

Sky glow as a result of light pollution can have negative impacts on wildlife and ecosystems by disrupting natural day and night cycles inherent in managing behaviors such as migration, reproduction, nourishment, sleep, and protection from predators. Wildlife impacts from light pollution is of concern to TPWD.

Recommendation: TPWD recommends committing to dark-sky lighting practices for the new VA healthcare facility. When lighting is added, TPWD recommends minimizing sky glow by focusing light downward, with full cutoff luminaries to avoid light emitting above the horizontal. TPWD recommends using the minimum amount of night-time lighting needed for safety and

security and to use dark-sky friendly lighting that is on only when needed, down-shielded, as bright as needed, and minimizing blue light emissions. Appropriate lighting technologies and beneficial management practices (BMPs) can be found on the International Dark-Sky Association website.

Federal Laws

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests, by killing or capturing, to human control, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The USFWS Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

Recommendation: TPWD recommends excluding vegetation clearing activities during the general bird nesting season, March 15 through September 15, to avoid adverse impacts to breeding birds. If clearing vegetation during the migratory bird nesting season is unavoidable, TPWD recommends surveying the area proposed for disturbance to ensure that no nests with eggs or young will be disturbed by operations. TPWD recommends performing active bird nest surveys no more than five days prior to planned clearing or construction. TPWD recommends that a minimum 150-foot buffer of vegetation remain around any active nests that are observed prior to disturbance. Any vegetation (such as trees, shrubs, and grasses) or other open areas where occupied nests are located should not be disturbed until the eggs have hatched and the young have fledged.

State Laws

Texas Parks and Wildlife Code – Chapter 64, Birds

Texas Parks and Wildlife Code Section 64.002, regarding protection of nongame birds, provides that no person may catch, kill, injure, pursue, or possess a bird that is not a game bird. Texas Parks and Wildlife Code Section 64.003, regarding destroying nests or eggs, provides that, no person may destroy or take the nests, eggs, or young and any wild game bird, wild bird, or wild fowl.

Recommendation: Please review the *Migratory Bird Treaty Act* section above for recommendations as they are also applicable for Chapter 64 of the Texas Parks and Wildlife Code compliance.

Texas Parks and Wildlife Code, Section 68.015 – State-listed Species

Texas Parks and Wildlife Code regulates state-listed threatened and endangered animal species. The capture, trap, take, or killing of state-listed threatened and endangered animal species is unlawful unless expressly authorized under a permit issued by USFWS or TPWD. The *TPWD Guidelines for Protection of State-Listed Species*, which includes a list of penalties for take of species, can be found on the Wildlife Habitat Assessment Program website. State-listed species may only be handled by persons with authorization obtained through TPWD. For more information on this permit, please contact the Wildlife Permits Office at (512) 389-4647.

Texas horned lizard (*Phrynosoma cornutum*)

The project area may provide suitable habitat for the state-listed threatened Texas horned lizard. There are several research-grade iNaturalist (www.inaturalist.org) observations for this species located within El Paso County. The Texas horned lizard inhabits open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees and soil may vary in texture from sandy to rocky.

If present in the project area, the Texas horned lizard could be impacted by ground disturbing activities from construction. A useful indication that the Texas horned lizard may occupy the site is the presence of harvester ant (*Pogonomyrmex barbatus*) mounds since harvester ants are the primary food source of Texas horned lizards. Texas horned lizards may hibernate on-site in loose soils a few inches below ground during the cool months from September/October to March/April. Construction in these areas could harm hibernating lizards. Horned lizards are active above ground when temperatures exceed 75 degrees Fahrenheit. If horned lizards (nesting, gravid females, newborn young, lethargic from cool temperatures or hibernation) cannot move away from noise and approaching construction equipment in time, they could be affected by construction activities.

Recommendation: TPWD recommends implementing the following BMPs to assist in minimizing potential impacts to the Texas horned lizard. Implementing the following BMPs could also help minimize impacts to a variety of native wildlife species that may inhabit the project area:

Contractor Training for Protected Species – TPWD recommends providing training for project contractors prior to the construction of the proposed project. Wildlife training should consist of identification of Texas horned lizards and their primary food source (harvester ants), and the proper protocol to avoid impact if a Texas horned lizard or other rare or protected species is encountered. TPWD recommends instructing contractors to avoid impacts to harvester ant mounds where feasible. TPWD understands that ant mounds in the direct path of

construction would be difficult to avoid, but contractors should be mindful of these areas when deciding where to place project specific locations and other disturbances associated with construction.

Biological Monitor – TPWD recommends that a permitted biologist be on-site during construction activities, especially during site clearing and trenching, to look for protected species, advise the construction crews on appropriate action if horned lizards are observed, and relocate any protected individuals that are in imminent harm. Biologists must be authorized to handle horned lizards and other state-listed species. If a biological monitor cannot be on-site during construction, site personnel should be trained for encounters with protected species and a qualified biologist should be notified of the siting and consulted on appropriate action.

Horned Lizard Encounters – If Texas horned lizards are encountered, they should be avoided and allowed to leave the project area on their own. If a horned lizard must be relocated, TPWD recommends relocating them off-site to an area that is close-by and contains similar habitat. TPWD recommends that any translocations of reptiles be the minimum distance possible no greater than one mile, preferably within 100 to 200 yards from the initial encounter location. After horned lizard removal, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude horned lizards and other reptiles.
The exclusion fence should be constructed and maintained as follows:

- The exclusion fence should be constructed with metal flashing or drift fence material. Rolled erosion control mesh material should not be used.
- The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
- The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated with site-specific native species.

Speed Limits – TPWD recommends reducing speed limits in the project area to at least 15 mph to help prevent vehicle-induced mortality of this species.

Work During Cold Weather – If construction activities take place during cold weather, it is recommended that construction personnel stay observant of activities that may harm the Texas horned lizard, such as disruption of burrows. In cold weather, this species will use burrows or pallets near the base of vegetation for shelter. Their slow metabolism in cold weather can reduce movements, restricting their ability to flee from danger.

Trenches – To avoid direct harm to state-listed species and other wildlife that may occur in the project area, TPWD recommends that any open trenches or excavation areas be covered overnight and/or inspected every morning to ensure no Texas horned lizards or other wildlife have been trapped. For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Also, inspect excavation areas for trapped wildlife prior to refilling. As previously mentioned, if state-listed species are trapped in trenches, they should be removed by personnel permitted by TPWD to handle state-listed species.

No Kill Wildlife Policy – TPWD recommends implementing a "No Kill Wildlife Policy" during the construction and operation of the site. This policy prevents inadvertently killing protected species that may be mistaken for common species.

Species of Greatest Conservation Need

In addition to state and federally-protected species, TPWD tracks Species of Greatest Conservation Need (SGCN) and other special features and natural communities that are not listed as threatened or endangered. These species and communities are tracked in the Texas Natural Diversity Database (TXNDD), and TPWD actively promotes their conservation. TPWD considers it important to evaluate and, if necessary, minimize impacts to SGCN and their habitat to reduce the likelihood of endangerment and preclude the need to list as threatened or endangered in the future.

Wheeler's spurge (*Chamaesyce geyeri var wheeleriana*)

There is one TXNDD record for Wheeler's spurge located within the project area. This species is found on sparingly vegetated, loose eolian quartz sand on reddish sand dunes or coppice mounds. The Wheeler's spurge flowers and fruits at least August through September, but probably earlier and later as well.

Recommendation: TPWD recommends that the area proposed for disturbance be surveyed for Wheeler's spurge where suitable habitat is present. Field surveys should be performed by a qualified biologist familiar with the identification of this species. Surveys should be conducted when this species is most detectable and identifiable (usually during the flowering period), and disturbance should be avoided during construction to the extent feasible. If Wheeler's spurge is found in the path of construction, this office should be contacted for further coordination and possible salvage of plants and/or seeds for seed banking. Plants not in the direct path of construction should be protected by markers or fencing and by instructing construction crews to avoid any harm.

Western box turtle (*Terrapene ornata*)

There are several research-grade iNaturalist observations for the western box turtle located within El Paso County, with the closest observation located approximately 2.7 miles from the project area. The western box turtle occurs throughout Texas, typically in open habitats such as prairie grasslands, pastures, fields, sandhills, and open woodlands. Adults have a home-range size of approximately 6 to 14 acres. This species is active spring through fall with courtship and mating occurring primarily in the spring. For shelter, they burrow into soil (e.g., under plants such as yucca) or enter burrows made by other species. Eggs are laid in nests dug in soft well-drained soil in open areas. Western box turtles are threatened by habitat loss and fragmentation, vehicle strikes on roads, and collection for the pet trade and food markets. The project area may provide suitable habitat for this species.

Roundtail horned lizard (*Phrynosoma modestum*)

There are several research-grade iNaturalist observations for the roundtail horned lizard located within El Paso County. This species seems to prefer rocky or gravelly substrates in open areas that are sparsely vegetated. The project area may provide suitable habitat for this species.

Gray-checkered whiptail (*Aspidoscelis dixoni*)

There are several research-grade iNaturalist observations for the gray-checkered whiptail located within El Paso County, with the closest observation located approximately 4.2 miles from the project area. This species inhabits rocky plains, dry washes, canyon bottoms, and desert scrub (ocotillo, creosotebush, opuntia). The project area may provide suitable habitat for this species.

Western rattlesnake (*Crotalus viridis*)

There are several research-grade iNaturalist observations for the western rattlesnake located within El Paso County, with the closest observation located approximately 2.1 miles from the project area, within Fort Bliss. The western rattlesnake inhabits grasslands, both desert and prairie, as well as shrub desert rocky hillsides. This species can also be found at the edges of arid and semi-arid river breaks. The project area may provide suitable habitat for this species.

Western massasauga (*Sistrurus tergeminus*)

The proposed project is located within the known range of the western massasauga. The western massasauga is common in gently rolling prairies occasionally broken by creek valleys or rocky hillsides. The project area may provide suitable habitat for this species.

Chihuahuan Desert lyre snake (*Trimorphodon vilkinsonii*)

The proposed project is located within the known range of the Chihuahuan Desert lyre snake. This species is mostly crevice-dwelling in predominantly limestone-surfaced desert northwest of the Rio Grande from Big Bend to the Franklin Mountains. This species also occurs in desert flats, succulent and scrub, and mountain canyons to about 6,000 feet. The project area may provide suitable habitat for this species.

Recommendations: TPWD recommends implementing the following BMPs to minimize impacts to the above-listed terrestrial reptile SGCN.

- As previously stated, TPWD recommends the use of no-till drilling, hydromulching and/or hydroseeding due to a reduced risk to wildlife. If erosion control blankets or mats will be used, the product should not contain netting, but if it must contain netting it should contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. TPWD recommends avoiding the use of plastic mesh matting.
- As previously stated, for open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
- Identify locations of burrows on the project site and avoid impacts to burrows if feasible.
- TPWD recommends that any translocations of reptiles be the minimum distance possible no greater than one mile, preferably within 100 to 200 yards from the initial encounter location.
- Inform contractors that if reptiles are found on the project site allow species to safely leave the project area.
- Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
- Contractors should be advised of potential occurrence in the project area, and to avoid harming these species if encountered.
- Due to increased activity (mating) of reptiles during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged.
- When designing roads or parking areas with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.

Recommendation: Because snakes are generally perceived as a threat and killed when encountered, and since the project area contains suitable habitat for the western massasauga, Chihuahuan Desert lyre snake, and western rattlesnake, TPWD recommends construction personnel and contractors be advised to avoid injury or harm to all snakes encountered during clearing and construction. Injury to humans usually occurs when the snake becomes agitated

following harassment or when someone attempts to handle a recently dead venomous snake that still contains its bite reflex. Therefore, contractors should avoid contact with snakes if encountered and allow all native snakes to safely leave the premises.

Western burrowing owl (*Athene cunicularia hypugaea*)

There are several eBird (www.ebird.org) observations for the western burrowing owl located within El Paso County, including an observation located approximately 1.0 mile from the project area, within Fort Bliss. There are several research-grade iNaturalist observations for the western burrowing owl located within El Paso County, with the closest observation located approximately 2.3 miles from the project area, within Fort Bliss. TPWD also notes that data provided to TPWD from the Fort Bliss Military Base indicates a burrowing owl observation located approximately 2.7 miles from the project area.

The western burrowing owl is a ground-dwelling owl that uses the burrows of prairie dogs and other fossorial animals for nesting and roosting. When natural burrows are limited, this species will breed in urban habitats which may lead to problems for the owls or their young. The owls opportunistically live and nest in road and railway rights-of-way, parking lots, baseball fields, school yards, golf courses, and airports. They have also been found nesting on campuses, in storm drains, drainage pipes, and cement culverts, on banks, along irrigation canals, under asphalt or wood debris piles, or openings under concrete pilings or asphalt. The burrowing owl is protected under the MBTA, and take of these birds, their nests, and eggs is prohibited. Potential impacts to the burrowing owl could include habitat removal as well as displacement and/or destruction of nests and eggs if ground disturbance occurs during the breeding season. The project area may provide suitable habitat for this species.

Recommendation: TPWD recommends avoiding disturbance of mammal burrows or other suitable habitat during the construction of the proposed project. As previously mentioned, TPWD recommends conducting project activities outside the breeding season (March 15 to September 15). Nesting areas and burrows should be protected from intensive disturbance during incubation. Excavation of an active nest burrow may destroy eggs, young owls, or even adults and is violation of the MBTA. If nesting owls are found inhabiting the project area, disturbance should be avoided until the eggs have hatched and the young have fledged. TPWD also recommends advising contractors of the potential for this species to occur in the project area year-round, and to avoid harming this species and their nests/burrows if encountered.

Kit fox (*Vulpes macrotis*)

There is one TXNDD record for the kit fox located approximately 1.0 mile from the project area. This species primarily inhabits open desert, shrubby or shrub-grass habitat. The project area may provide suitable habitat for the kit fox.

> **Recommendation:** If the kit fox is encountered during construction, TPWD recommends that precautions be taken to avoid direct or indirect impacts to this species or their dens.

Evaluation of SGCN

TPWD notes that it is the responsibility of the project proponent to evaluate all of the species listed on the TPWD Rare, Threatened, and Endangered Species of Texas by County online application (RTEST or TPWD county list), not just state and federally-listed species, and to determine if those species have habitat within the project area and if those species have the potential to be impacted by the construction of the proposed project.

> **Recommendation:** Please review the TPWD county list for El Paso County because species in addition to those discussed in this letter could be present within the project area depending upon habitat availability. TPWD recommends including a discussion and evaluation of potential impacts to SGCN (in addition to state-listed and federally-listed species) in the EA for this project. The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for federally-listed species.
>
> Determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty and then only with repeated negative observations, considering all the variable factors contributing to the lack of detectable presence. If encountered during construction, measures should be taken to avoid impacting all wildlife, regardless of listing status.

Texas Natural Diversity Database

The TXNDD is intended to assist users in avoiding harm to rare species or significant ecological features. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species,

natural communities, or other significant features within your project area. These data are not inclusive and cannot be used as presence/absence data. They represent species that could potentially be in your project area. This information cannot be substituted for field surveys.

Recommendation: The TXNDD is updated continuously based on new, updated and undigitized records; therefore, TPWD recommends requesting the most recent TXNDD data on a regular basis. For questions regarding a record or to request the most recent data, please contact TexasNatural.DiversityDatabase@tpwd.texas.gov.

Recommendation: To aid in the scientific knowledge of a species' status and current range, TPWD encourages project proponents and their contractors report all encounters of SGCN, state-listed, and federally-listed species to the TXNDD according to the data submittal instructions found on the TXNDD website.

TPWD strives to respond to requests for project review within a 45-day comment period. Responses may be delayed due to workload and lack of staff. Failure to meet the 45-day review timeframe does not constitute a concurrence from TPWD that the proposed project will not adversely impact fish and wildlife resources.

TPWD appreciates the opportunity to provide comments and recommendations for this project. If you have any questions, please contact me at (512) 389-8054 or Jessica.Schmerler@tpwd.texas.gov.

Sincerely,

Jessica Schmerler

Jessica E. Schmerler, CWB
Wildlife Habitat Assessment Program
Wildlife Division

JES:46875

B.4 Texas Historical Commission Correspondence

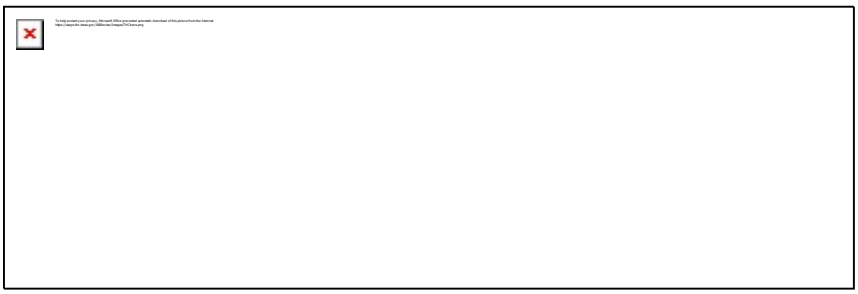
Jesse Byrd

From: Yduarte, Martha CIV USARMY IMCOM CENTRAL (USA) <martha.yduarte.civ@army.mil>
Sent: Monday, April 4, 2022 12:14 PM
To: Mulvey, Kelly A CIV USARMY IMCOM (USA); Guerrero, Myra CIV USARMY ID-READINESS (USA)
Cc: Mack, Bruce G. (CFM); Abreu, Hector M.; Sara Schulkowski; Jesse Byrd
Subject: FW: [Non-DoD Source] Section 106 Submission (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Consultation email response for the Sanitary Sewage Line for VA HCC below:

From: noreply@thc.state.tx.us <noreply@thc.state.tx.us>
Sent: Thursday, March 31, 2022 9:38 AM
To: Yduarte, Martha CIV USARMY IMCOM CENTRAL (USA) <martha.yduarte.civ@army.mil>; reviews@thc.state.tx.us
Subject: [Non-DoD Source] Section 106 Submission



Re: Project Review under Section 106 of the National Historic Preservation Act
THC Tracking #202207552
Date: 03/31/2022
Sanitary Sewage Line for VA HCC
Fort Bliss - Purple Heart Hwy
El Paso,TX 79916

Description: Sanitary sewer line associated with the proposed construction of a VA Health Clinic on Fort Bliss, Texas (Track # 202206137)

Dear Martha Yduarte:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Drew Sitters, has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- No historic properties affected. However, if cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural

materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided.
- Property/properties are not eligible for listing in the National Register of Historic Places.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: drew.sitters@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

CLASSIFICATION: UNCLASSIFIED

Re: Project Review under Section 106 of the National Historic Preservation Act
THC Tracking #202112107
Date: 07/27/2021
Proposed Health Clinic at Fort Bliss, TX

Description: Project Correspondence - Notice of Scoping and Stakeholder Involvement

Dear Department of Veteran Affairs:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Caitlin Brashear, Drew Sitters, has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- Archeological sites are to be avoided and protected from project impacts.

We have the following comments: Portions of the Area of Consideration have been previously evaluated for cultural resources resulting in the documentation of roughly 25 archeological sites. Of these, 11 were deemed ineligible for inclusion on the National Register of Historic Places, seven lack an eligibility determination (41EP2682, 2683, 2685, 2686, 2709, 5768, and 5955), and no information is available for two of the sites (41EP1150 and 41EP1151). Sites 41EP1146, 1147,1148, and 2684 were deemed undetermined, while 41EP6001 is considered eligible for inclusion in the NRHP. Therefore, the proposed undertaking should consider its potential effects on, and avoid impacts to, those sites with unknown and undetermined eligibility, as well as to site 41EP6001. If avoidance is not possible, additional consultation with the Texas Historical Commission will be required. Regarding above-ground resources, there are no known historic resources within the Area of Consideration. However, any resources 45-years of age or older located within the proposed project area will need to be identified, evaluated for listing in the National Register of Historic Places, and any Eligible resources will need to be assessed for effects by the proposed project.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: caitlin.brashear@thc.texas.gov, drew.sitters@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

TEXAS HISTORICAL COMMISSION
real places telling real stories

Re: Project Review under Section 106 of the National Historic Preservation Act
THC Tracking #202207095
Date: 03/22/2022
Fort Bliss
Intersection of Highway 375 and 601 in Fort Bliss
El Paso,TX

Description: On behalf of the U.S. Department of Veterans Affairs (VA), and as a sub-consultant to LRS Federal, SWCA Environmental Consultants (SWCA) conducted an intensive archaeological survey of the proposed

Dear Alissa Healy:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Caitlin Brashear and Drew Sitters, has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- No historic properties affected. However, if cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THCâ€™s Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: caitlin.brashear@thc.texas.gov, drew.sitters@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

Jesse Byrd

To: Mack, Bruce G. (CFM)
Subject: FW: Section 106 Submission

From: noreply@thc.state.tx.us <noreply@thc.state.tx.us>
Sent: Monday, May 9, 2022 12:32 PM
To: Amanda Cohen <acohen@swca.com>; reviews@thc.state.tx.us
Subject: Section 106 Submission

Re: Project Review under Section 106 of the National Historic Preservation Act
THC Tracking #202208986
Date: 05/09/2022
El Paso Veterans Affairs Health Care Center
Fort Bliss
El Paso,TX

Description: The U.S. Department of Veterans Affairs (VA) is initiating Section 106 consultation for the proposed construction of a new health care center (HCC) located on Fort Bliss in El Paso County, Texas.

Dear Amanda Cohen:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Caitlin Brashear and Drew Sitters, has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- No historic properties affected. However, if cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: caitlin.brashear@thc.texas.gov, drew.sitters@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

C Appendix C: Traffic Study

CobbFendley

Memo

To: Sara Schulkowski, LRS Federal LLC

From: Brian Castille, P.E., PTOE, Project Manager - Traffic

Date: May 4, 2022

Re: Fort Bliss VA Health Care Center TIA (July 2021)

5/4/22

There has been an additional request from the VA to document the average daily traffic (ADT) volume increase (%) resulting from the construction and operation of the new HCC. The VA's regulation for a significant impact is, "an increase in average daily traffic volume of at least 20 percent on access roads to the Site or the major roadway network."

In Table 4-5 of the report, the 2027 No Build AM and PM Peak Hour volumes are shown at the study intersections (8 total). In Table 4-7 of the report, the 2027 Full Build Out AM and PM Peak Hour volumes are shown at the same 8 study intersections. In order to convert these hourly volumes to an ADT, the highest peak hour volume was paired with an assumed 0.10 k-factor to calculate an assumed ADT.

For these 8 intersections, the volumes were combined and percents were calculated as followed to gauge the impact to the study area:

No Build:

AM Peak Hour Volume	PM Peak Hour Volume	Assumed ADT (with 0.10 k-factor)
7,467	6,223	77,280

Full Build Out:

AM Peak Hour Volume	PM Peak Hour Volume	Assumed ADT (with 0.10 k-factor)
8,667	7,294	89,280

Percent Change:

AM Peak Hour % Change in Volume	PM Peak Hour Volume % Change in Volume	Assumed ADT (with 0.10 k-factor)
16.1%	17.2%	15.5%

Based on the information above, it is not anticipated to reach the 20 percent threshold.

CobbFendley

Memo

To: Sara Schulkowski, Environmental Engineer, LRS Federal LLC

From: Mike Miranda, P.E., PTOE, Project Manager - Traffic

Date: October 8, 2021

Re: Fort Bliss VA Health Care Center TIA (July 2021) – Correction to Table 4-8

A correction memo is being issued in response to the email received on October 4, 2021, asking for clarification on the PM level of service (LOS) shown on Table 4-8 (page 16 of the report) for the intersection of Loop 375 and Spur 601.

As stated in an email reply sent on October 8, 2021, please note that there was a typo for the PM intersection LOS (for the above-referenced intersection) shown as LOS "A". The correct LOS should have been shown as LOS "F", keeping in line with the projected LOS for the other scenarios analyzed.

The applicable section of Table 4-8 is shown below (typo is highlighted in yellow) for your convenience:

Loop 375 (Purple Heart Boulevard) Northbound Frontage Road (NBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	817.5	20.6	5.3	-	-	-	-	12.3	-	-	39.8	3.3	673.9
	F	C	A	-	-	-	-	B	-	-	D	A	F
PM Existing	313.7	37.6	6.2	-	-	-	-	3.8	-	-	109.8	9.6	178.9
	F	D	A	-	-	-	-	A	-	-	F	A	A
Loop 375 (Purple Heart Boulevard) access road (North) & Ivan Medina Drive													

2616 N. McColl Road | McAllen, Texas 78501 | Phone: 956.627.0098 | Fax: 956.627.0099 | www.cobbfendley.com
TBPELS Firm No. F-274 | TBPELS Branch No. 10194508

U.S. Department of Veterans Affairs

Fort Bliss Veterans Affairs Health Care Center
Traffic Impact Analysis

July 2021

Prepared for:
U.S. Department of Veterans Affairs
Office of Construction and Facilities Management

Prepared by:
LRS Federal LLC
(via CobbFendley)

CobbFendley
TBPE Firm No. F-274

Executive Summary

Cobb, Fendley & Associates, Inc. was asked to perform a traffic impact analysis (TIA) for the proposed Fort Bliss Veterans Affairs Health Care Center (VA HCC), located in El Paso, Texas. The proposed facility would consist of an approximately 500,000-square-foot (Sq. Ft.) VA health care center located on an approximately 30-acre site, plus minor real estate to support utilities, support services, and parking on the Fort Bliss Garrison adjacent to and southeast of the new William Beaumont Army Medical Center (WBAMC) on Fort Bliss.

The development's opening year (full build-out year) is anticipated to be 2027 for the purpose of this analysis. This traffic impact analysis examined the AM and PM Peak Hours for the following scenarios:

- 2021 Existing
- 2027 Opening Year (No Build)
- 2027 Opening Year (Full Build-out)
- 2032 (5 Years After Opening Year)

Intersection delay and level of service (LOS) for existing and future conditions were evaluated using Synchro software to determine the impact of the proposed VA HCC on the intersections within the study area. The Conclusions and Recommendations section of this TIA includes several off-site traffic mitigation measures that could potentially be considered to minimize the impacts of the proposed VA HCC traffic on each of the study intersections.

Because there was no detailed site plan available at the time that this TIA was being completed, items that are typically included in an access management analysis (such as access point spacing, and the need for auxiliary lanes and channelization measures) could not be evaluated. The proposed VA HCC is anticipated to be served by the two existing access control points (ACPs). Both ACPs are located on roadways internal to Fort Bliss (not a part of the TxDOT system), therefore there are no existing or proposed facilities that fall within applicability for compliance with TxDOT *Access Management Manual* access management criteria.

A vehicular queuing analysis was completed for the two existing ACPs. The north ACP is located east of the intersection of Constitution Avenue and Iron Dustoff Drive and currently has two lanes. The south ACP is located on the north side of Iron Medics Drive directly south of the proposed VA HCC site and currently has three lanes. The north ACP is projected to carry approximately 40% of the VA HCC's generated trips, and the south ACP is projected to carry approximately 60% of the VA HCC's generated trips. This uneven trip distribution was selected because the north ACP serves as the commercial vehicle access point, and the south ACP has a visitor control center. Projected peak hour volumes for the 2027 Opening Year (Full Build-out) scenario were used to analyze the ability of the existing lanes at each ACP to handle traffic loads, and to determine how many additional lanes would be required, if any, at each ACP, based on traffic projections. The results of the queuing analysis show that the exiting number of lanes can handle the projected traffic for the WBAMC and the VA HCC, if both lanes are operating at the north ACP, and at least two lanes (out of three) are operating at the south ACP during the AM peak. To minimize delays, it is recommended that all lanes at each ACP remain in operation during the AM peak.

Parking generation calculations were performed using two methods: the Institute of Transportation Engineers (ITE) *Parking Generation Manual*, 5th edition, and the City of El Paso's parking requirements. The calculated parking demand of 1,114 spaces (from the ITE *Parking Generation Manual*) falls between the 869 minimum and 1,250 maximum parking spaces (from the City of El Paso's parking requirements). The proposed VA HCC is anticipated to have approximately 1,500 surface parking spaces. The proposed 1,500 parking spaces should be sufficient since the proposed number of parking spaces is well above the calculated parking requirements. Based on the City of El Paso's parking requirements, approximately 18 accessible parking stalls would be required based on the minimum number of parking spaces (869). Of

those 18 accessible parking stalls, at least 3 would be required to be van-accessible parking stalls. Similarly, approximately 23 accessible parking stalls would be required based on the maximum number of parking spaces (1,250). Of those 23 accessible parking stalls, at least 4 would be required to be van-accessible parking stalls. Based on the proposed VA HCC land use, it is recommended that more accessible (and van-accessible) parking stalls be provided rather than simply aiming to comply with the City of El Paso's minimum requirements.

Typically, the internal site circulation of a proposed development is analyzed for safety and efficiency as part of a TIA. Because a detailed site plan was not available at the time that this TIA report was completed, the internal site circulation was only analyzed for the existing roadways within the study area that will serve the proposed VA HCC. The proposed VA HCC site is located immediately east of the existing WBAMC. The WBAMC has an existing internal roadway network that ultimately connects to the existing ACPs along Iron Medics Drive (to the south) and along Iron Dustoff Drive (to the northwest). Without a detailed site plan, it can only be projected that traffic for the VA HCC will use the existing perimeter road that surrounds all the existing parking lots for the WBAMC. When designing new access connections to an existing roadway, it is recommended to align the new access connections to existing roadways or aisles, or to off-set the access connections, to minimize the number of vehicular conflict points. The existing WBAMC parking lot has multiple internal roadways that could potentially be used to aid in the placement selection of proposed aisles and internal roadways during the design of a detailed site plan for the VA HCC.

Table of Contents

1.0 Introduction 1
2.0 Study Area 2
2.1 Site Observations 2
2.1.1 Roadways 2
2.1.1.1 Spur 601 (Liberty Expressway) 2
2.1.1.2 Loop 375 (Purple Heart Boulevard) 3
2.1.1.3 Constitution Avenue 3
2.1.1.4 Iron Dustoff Drive 3
2.1.1.5 Iron Medics Drive 3
2.1.2 Existing Intersection Control 3
3.0 Traffic Analysis 4
3.1 Traffic Volumes 4
3.1.1 Peak Hour Determination 5
3.1.2 Adjustment Factor to Account for Impacts from COVID-19 Pandemic 6
3.1.3 Average Annual Growth Rate 6
3.2 Trip Generation 6
3.3 Trip Distribution 8
3.4 Trip Assignment 9
4.0 Analysis for Existing and Future Conditions 10
4.1 2021 Existing Conditions 11
4.2 2027 Opening Year (No Build) Conditions 13
4.3 2027 Opening Year (Full Build-out) Conditions 15
4.4 2032 Future (5 Years After Opening Year) Conditions 17
4.5 Potential Mitigation Measures for Intersections 19
4.6 Access Management 20
4.7 Vehicular Queuing Analysis for ACPs 20
4.8 Parking Analysis and Internal Site Circulation 22
4.8.1 Parking Analysis 22
4.8.2 Internal Site Circulation 23
5.0 Conclusions and Recommendations 24

Appendices

A City of El Paso Code of Ordinances A-1
B Site Visit Photos B-1
C City of El Paso Major Thoroughfare Plan (MTP) C-1
D Site Location Maps D-1
E Turning Movement Counts (TMCs) E-1
F Average Annual Growth Rate & COVID-19 Adjustment Factor Calculations F-1
G Trip Assignment (PTV Vistro Exhibits) G-1
H Synchro Summary Reports H-1

List of Tables

Table 3-1. Fort Bliss VA HCC TIA Analysis Scenarios 4
Table 3-2. AM and PM Peak Hour Determination 5
Table 3-3. AM Peak Hour Trip Generation 7
Table 3-4. PM Peak Hour Trip Generation 7
Table 3-5. Weekday Trip Generation 7
Table 4-1. Fort Bliss VA HCC TIA Synchro Analysis Scenarios 10
Table 4-2. Level of Service (LOS) Criteria 10
Table 4-3. 2021 Existing AM and PM Peak Hour Volumes 11
Table 4-4. 2021 Existing AM and PM Peak Hour Delay and LOS 12
Table 4-5. 2027 Opening Year (No Build) AM and PM Peak Hour Volumes 13
Table 4-6. 2027 Opening Year (No Build) AM and PM Peak Hour Delay and LOS 14
Table 4-7. 2027 Opening Year (Full Build-out) AM and PM Peak Hour Volumes 15
Table 4-8. 2027 Opening Year (Full Build-out) AM and PM Peak Hour Delay and LOS 16
Table 4-9. 2032 Future (5 Years After Opening) AM and PM Peak Hour Volumes 17
Table 4-10. 2032 Future (5 Years After Opening) AM and PM Peak Hour Delay and LOS 18
Table 4-11. Vehicular Queuing Analysis for the South ACP 21
Table 4-12. Vehicular Queuing Analysis for the North ACP 21
Table 4-13. Weekday (Monday – Friday) Parking Generation 22
Table 4-14. City of El Paso Parking Requirements 23

List of Figures

Figure 1-1. Project Vicinity Map 1
Figure 2-1. View of the site looking southwest from Loop 375 (Purple Heart Boulevard) 2
Figure 3-1. Map of Intersections for Traffic Counts 5
Figure 3-2. Trip Distribution 8
Figure 3-3. Trip Assignment 9
Figure 4-1. Time of Day Distribution for Parking Demand 22

Acronyms and Abbreviations

AADT	average annual daily traffic
ACP	access control point
AM	morning
CNBD	could not be determined
COVID-19	corona virus disease 2019
DDI	diverging diamond interchange
EBFR	eastbound frontage road
GFA	gross floor area
HCC	health care center
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	level of service
MPH	miles per hour
MTP	Major Thoroughfare Plan
NBFR	northbound frontage road
PM	afternoon
s/veh	seconds per vehicle
SBFR	southbound frontage road
Sq. Ft.	square feet (area)
TIA	traffic impact analysis
TMCs	turning movement counts
TxDOT	Texas Department of Transportation
VA	U.S. Department of Veterans Affairs
WBAMC	William Beaumont Army Medical Center
WBFR	westbound frontage road

1.0 Introduction

Cobb, Fendley & Associates, Inc. was asked to perform a traffic impact analysis (TIA) for the proposed Fort Bliss Veterans Affairs Health Care Center (VA HCC), located in El Paso, Texas. The proposed facility would consist of an approximately 500,000-square-foot (Sq. Ft.) VA HCC located on an approximately 30-acre site, plus minor real estate to support utilities, support services, and parking on the Fort Bliss Garrison adjacent to and southeast of the new William Beaumont Army Medical Center (WBAMC) on Fort Bliss.

The development's opening year (full build-out year) is anticipated to be 2027 for the purpose of this analysis. This traffic impact analysis examined the AM and PM Peak Hours for the following scenarios:

- 2021 Existing
- 2027 Opening Year (No Build)
- 2027 Opening Year (Full Build-out)
- 2032 (5 Years After Opening Year)

The site is located on the south side of Loop 375 (Purple Heart Boulevard) near Iron Medics Drive, within Fort Bliss in El Paso, Texas. The project vicinity map is shown below in **Figure 1-1**.

Figure 1-1. Project Vicinity Map

The purpose of this report is to summarize the traffic impacts of the proposed development upon the surrounding roadways and intersections. A trip generation analysis was performed to estimate the anticipated number of trips resulting from the construction of the VA HCC. The generated traffic was added to the future projected volumes to provide an estimate of future traffic demand in the vicinity of the proposed development.

2.0 Study Area

The TIA study area was determined based on the City of El Paso Code of Ordinances, Section 19.18.030 – *Criteria for determining traffic impact analysis requirements*. This ordinance states that for developments projected to generate 501-1000 Peak Hour Trips (see **Table 3-4** on page 7), the TIA study area shall include, *the frontage of the property, all access points (including common access), and all intersections within a **1-mile radius** of the proposed development.* The City of El Paso Code of Ordinances, Chapter 19.18 –*Traffic Impact Analysis* is provided in **Appendix A**.

2.1 Site Observations

Authorization was obtained from Fort Bliss for CobbFendley staff to make a site visit to take photographs of the approaches for each of the intersections within the study area. The photographs are included in **Appendix B**.

The proposed VA HCC will be located directly adjacent to (and east of) the new WBAMC on Loop 375 (Purple Heart Boulevard) within Fort Bliss, in El Paso, TX.

Figure 2-1 is a view of the undeveloped site from Loop 375 (Purple Heart Boulevard).

Figure 2-1. View of the site looking southwest from Loop 375 (Purple Heart Boulevard)

2.1.1 Roadways

The City of El Paso's Major Thoroughfare Plan (MTP) designates both Spur 601 (Liberty Expressway) and Loop 375 (Purple Heart Boulevard) as Freeways/Expressways. The other roadways within the vicinity of the project site are not classified in the MTP. A map showing the City of El Paso's MTP layers in the vicinity of the project site can be found in **Appendix C**.

2.1.1.1 Spur 601 (Liberty Expressway)

Spur 601 (Liberty Expressway) runs east/west along the north side of the project vicinity. The Spur 601 (Liberty Expressway) mainlanes have a posted speed limit of 60 MPH and are comprised of two (2) lanes of traffic in each direction, separated by a concrete traffic barrier, with paved shoulders (inside and outside) and continuous roadway lighting. The Spur 601 (Liberty Expressway) frontage roads (that serve Constitution Avenue) do not have posted speed limit signs and are comprised of two (2) lanes of traffic in each direction, with paved shoulders (inside and outside) and approach/departure roadway lighting. The Spur 601 (Liberty Expressway) mainlanes merge with the frontage roads east of Constitution Avenue and result in three (3) lanes of traffic in each direction with a posted speed limit of 50 MPH, paved shoulders (inside and outside), and continuous roadway lighting. Spur 601 ends at the intersection with Loop 375 (Purple Heart Boulevard), where the roadway continues east as Liberty Expressway (not a part of the state highway system).

2.1.1.2 Loop 375 (Purple Heart Boulevard)

Loop 375 (Purple Heart Boulevard) runs primarily north/south along the east side of the project vicinity. The Loop 375 (Purple Heart Boulevard) mainlanes have a posted speed limit of 65 MPH and are comprised of two (2) lanes of traffic in each direction, separated by a wide, flush median containing high-tension cable barrier, with paved shoulders (inside and outside), and continuous roadway lighting. The Loop 375 (Purple Heart Boulevard) frontage roads (that serve Spur 601) do not have posted speed limit signs and are comprised of two (2) lanes of traffic in each direction, with paved shoulders (inside and outside) and approach/departure roadway lighting. The Loop 375 (Purple Heart Boulevard) mainlanes run on an overpass above the Spur 601 lanes.

2.1.1.3 Constitution Avenue

Constitution Avenue runs primarily east/west along the northwest side of the project vicinity. Constitution Avenue has a posted speed limit of 35 MPH and is comprised of two (2) lanes of traffic in each direction, separated by a wide, raised median, with bike lanes, and continuous roadway lighting. To the west, Constitution Avenue has a 90-degree bend, where it briefly runs north/south and intersects with Spur 601 (Liberty Expressway). To the east, Constitution Avenue terminates at Iron Dustoff Drive. There is an existing entrance/exit along the north side of Constitution Avenue in alignment with Iron Dustoff Drive for a parking lot that does not appear to be associated with any current buildings. There are currently no other existing access points in use along Constitution Avenue.

2.1.1.4 Iron Dustoff Drive

Iron Dustoff Drive runs north/south along the west side of the project vicinity. Iron Dustoff Drive has a posted speed limit of 35 MPH and is comprised of two (2) lanes of traffic in each direction, separated by a wide, raised median, with no shoulders, and continuous roadway lighting. To the north, Iron Dustoff Drive terminates at Constitution Avenue. To the south, Iron Dustoff Drive terminates at the intersection with Iron Medics Drive. There is an existing access control point (ACP) along the east side of Iron Dustoff Drive in alignment with Constitution Avenue. There is what appears to be a construction/service entrance along the east side of Iron Dustoff Drive, approximately 400 feet south of the existing ACP. There are currently no other existing access points in use along Iron Dustoff Drive.

2.1.1.5 Iron Medics Drive

Iron Medics Drive runs primarily east/west along the south side of the project vicinity. Iron Medics Drive has a posted speed limit of 35 MPH and is comprised of two (2) lanes of traffic in each direction, separated by a wide, raised median, with no shoulders, and continuous roadway lighting. To the east, Iron Medics Drive connects to the Loop 375 (Purple Heart Boulevard) frontage roads via an overpass and jug handle-type designs for the frontage roads. To the west, Iron Medics Drive terminates at the intersection with Iron Dustoff Drive. There is an existing ACP along the north side of Iron Medics Drive, immediately south of the proposed project site. There are currently no other existing access points in use along Iron Medics Drive. It should be noted that during the site visit, the eastern end of Iron Medics Drive was closed off with chain-link gates and with work zone (type-III) traffic barricades at the junction with the Loop 375 (Purple Heart Boulevard) frontage roads.

2.1.2 Existing Intersection Control

The intersection of Spur 601 (Liberty Expressway) and the Loop 375 (Purple Heart Boulevard) frontage roads form an innovative intersection design known as a diverging diamond interchange (DDI). A DDI is a type of interchange that requires traffic on the underpass to briefly drive on the opposite side of the road. The intersection of the Spur 601 (Liberty Expressway) frontage roads and Constitution Avenue form a traditional diamond interchange with traffic signal control. The 90-degree bend on Constitution

Avenue operates under all-way stop control. The intersection of Constitution Avenue and Iron Dustoff Drive operates under all-way stop control. The intersection of Iron Dustoff Drive and Iron Medics Drive operates under all-way stop control. The intersections of Iron Medics Drive and the Loop 375 (Purple Heart Boulevard) frontage roads operate under one-way stop control.

Because a detailed site plan was not available at the time that this TIA was completed, only site location maps are provided within **Appendix D** showing the proposed project site boundary. The intersections analyzed within the 1-mile study radius are identified in the map.

3.0 Traffic Analysis

The TIA analysis periods were also determined based on the City of El Paso Code of Ordinances, Section 19.18.030 – *Criteria for determining traffic impact analysis requirements*, which states that for developments projected to generate 501-1000 Peak Hour Trips, the TIA Analysis Periods shall include the following:

- Existing
- Opening Year
- Full Build-out Year
- 5 Years After Opening Year

The opening year (and full build-out year) for the VA HCC is anticipated to be 2027 for purposes of the TIA. Therefore, the analysis scenarios selected for this TIA will be the four (4) shown in **Table 3-1**.

Table 3-1. Fort Bliss VA HCC TIA Analysis Scenarios

TIA Analysis Scenarios
2021 Existing
2027 Opening Year (No Build)
2027 Opening Year (Full Build-out)
2032 Future (5 Years After Opening Year)

3.1 Traffic Volumes

Turning movement counts (TMCs) were collected on a typical day (Tuesday, Wednesday, or Thursday) in April 2021 during the AM (6AM-9AM) and the PM (4PM-7PM) peak periods for the following intersections located within the TIA study area:

- Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue
- Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue
- Constitution Avenue and Iron Dustoff Drive
- Iron Dustoff Drive and Iron Medics Drive
- Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway) *
- Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway) *
- Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive
- Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive

**Diverging Diamond Interchange*

The intersections listed were selected because they fall within the study area (a 1-mile radius of the boundaries of the project site). The map in **Figure 3-1** shows the intersections in relation to the proposed VA HCC. The summary tables and intersection diagrams for the TMCs can be found in **Appendix E**.

Figure 3-1. Map of Intersections for Traffic Counts

3.1.1 Peak Hour Determination

The overall AM and PM peak hours to be used for analysis in this TIA were determined from the TMCs collected at the intersections located within the TIA study area. **Table 3-2** shows the AM and PM peak hours for each individual intersection within the study area, as well as the overall AM and PM peak hours used for analysis in this TIA.

Table 3-2. AM and PM Peak Hour Determination

Location	AM Peak Hour	PM Peak Hour
Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue	6:30-7:30 AM	4:30-5:30 PM
Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue	6:30-7:30 AM	4:30-5:30 PM
Constitution Avenue and Iron Dustoff Drive	6:30-7:30 AM	4:00-5:00 PM
Iron Dustoff Drive and Iron Medics Drive	7:45-8:45 AM	(CNBD)*

Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway)	7:15-8:15 AM	4:30-5:30 PM
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway)	7:15-8:15 AM	4:45-5:45 PM
Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive	8:00-9:00 AM	4:00-5:00 PM
Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive	7:30-8:30 AM	4:45-5:45 PM
Peak Hours Used for Analysis	**6:45-7:45 AM**	**4:30-5:30 PM**

**(CNBD) = Could not be determined due to low volume during traffic counts.*

3.1.2 Adjustment Factor to Account for Impacts from COVID-19 Pandemic

The ongoing COVID-19 pandemic has had an inevitable impact on traffic volumes. With social distancing measures and some operating restrictions still in place, schools, businesses, and other places have experienced a reduction in traffic volumes compared to pre-pandemic "typical" traffic volumes. To account for these impacts, an adjustment factor was applied to convert the traffic data collected during the ongoing pandemic to pre-pandemic "typical" traffic volumes.

The traffic counts were collected in April 2021, well after stay-at-home orders were lifted and businesses could start re-opening with limited-to-full capacity, so traffic volumes have continued to normalize. TMCs from October 2019 provided by the City of El Paso (via an open records request) were used to establish pre-pandemic volumes. Based on calculations using the April 2021 TMCs, along with October 2019 TMCs, our assumption was to use an adjustment factor of approximately 1.04 (which assumes that traffic volumes were at approximately 96% of pre-pandemic "typical" traffic volumes when the traffic counts were collected). The COVID-19 adjustment factor calculations can be found in **Appendix F.**

3.1.3 Average Annual Growth Rate

Texas Department of Transportation (TxDOT) Statewide Planning Map data was used to calculate an average annual growth rate for traffic in the vicinity of the proposed development. Historical average annual daily traffic (AADT) data from the TxDOT map was used to calculate an average yearly growth rate of 2% (from 2014 to 2019; prior year AADT data were outliers). The historical AADT data and the growth rate calculations can be found in **Appendix F**. The annual growth rate was applied to the COVID-19-adjusted 2021 Existing (No Build) traffic counts for each subsequent year, to estimate the 2027 Opening Year (Full Build-out Year) and the 2032 Future (5 Years After Opening Year) traffic volumes for each analysis scenario, prior to adding the trips expected to be generated by the proposed VA HCC starting with the 2027 Opening Year (Full Build-out Year).

3.2 Trip Generation

Trip generation calculations were performed for the proposed 500,000 Sq. Ft. VA HCC using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th edition. ITE Land Use Code 610 – *Hospital* was used. Trips were calculated versus the proposed gross floor area (GFA) for the AM Peak Hour of Adjacent Street Traffic, for the PM Peak Hour of Adjacent Street Traffic, and for a Weekday.

Trip generation calculations were also performed for the existing WBAMC for comparison of generated trips between the existing WBAMC and the proposed VA HCC. The calculations show that the existing WBAMC generates approximately 2 trips for every 1 trip that the proposed VA HCC will generate. Thus, most of the traffic increase in the study area is associated with the WBAMC rather than the VA HCC.

Following ITE's *Recommended Procedure for Selecting Between Trip Generation Average Rates and Equation* flowchart, the Fitted Curve Equations were used to calculate the AM Peak Hour, PM Peak Hour, and Weekday trip generation. **Table 3-3** shows the AM Peak Hour Trip Generation, **Table 3-4** shows the PM Peak Hour Trip Generation, and **Table 3-5** shows the Weekday Trip Generation.

Table 3-3. AM Peak Hour Trip Generation

Facility	ITE Code	Land Use	Gross Floor Area, GFA (Sq. Ft)	Percent Entering	Entering Volume	Percent Exiting	Exiting Volume	Total Volume
VA HCC	610	Hospital	500,000	68%	337	32%	159	496
WBAMC	610	Hospital	1,132,000	68%	656	32%	308	964
Total	-	-	1,632,000	-	993	-	467	1,460

Table 3-4. PM Peak Hour Trip Generation

Facility	ITE Code	Land Use	Gross Floor Area, GFA (Sq. Ft)	Percent Entering	Entering Volume	Percent Exiting	Exiting Volume	Total Volume
VA HCC	610	Hospital	500,000	32%	167	68%	354	521
WBAMC	610	Hospital	1,132,000	32%	336	68%	715	1,051
Total	-	-	1,632,000	-	503	-	1,069	1,572

Table 3-5. Weekday Trip Generation

Facility	ITE Code	Land Use	Gross Floor Area, GFA (Sq. Ft)	Percent Entering	Entering Volume	Percent Exiting	Exiting Volume	Total Volume
VA HCC	610	Hospital	500,000	50%	2,832	50%	2,832	5,664
WBAMC	610	Hospital	1,132,000	50%	4,690	50%	4,690	9,380
Total	-	-	1,632,000	-	7,522	-	7,522	15,044

3.3 Trip Distribution

A combination of surrounding land use types, roadway network hierarchy, existing traffic data, and engineering judgment were used to estimate the Trip Distribution percentages to/from the proposed VA HCC site. **Figure 3-2** shows the trip distribution percentages to/from the proposed VA HCC site that were used for analysis using PTV Vistro software.

Figure 3-2. Trip Distribution

3.4 Trip Assignment

Trip Assignment was performed for the following eight (8) intersections within the study area:

(1) Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue
(2) Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue
(3) Constitution Avenue and Iron Dustoff Drive
(4) Iron Dustoff Drive and Iron Medics Drive
(5) Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway)
(6) Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway)
(7) Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive
(8) Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive

Figure 3-3 shows the Trip Assignment locations that were analyzed for the proposed VA HCC (the numbered intersections labeled in **Figure 3-3** correspond to the numbering shown in the list above):

Figure 3-3. Trip Assignment

Site traffic is proposed to be served from the two (2) existing ACPs, one located east of the intersection of Constitution Avenue and Iron Dustoff Drive, and the other located immediately south of the proposed site along Iron Medics Drive. Both existing ACPs currently have full-access operation (all turning movements possible) and no changes in operation are proposed. The northern ACP (located east of node 3) is projected to carry approximately 40% of the VA HCC's generated trips, and the south ACP (located between nodes 4 and 8) is projected to carry approximately 60% of the VA HCC's generated trips. The northern ACP is the commercial vehicle access point, and only the south ACP has a visitor control center, therefore the percentages are weighed more heavily toward the south ACP. Because the site does not have direct access (driveways) along any roadways other than Iron Dustoff Drive and Iron Medics Drive, this TIA was drafted under the assumption that there will be no additional access points in the future. Therefore, all entering and exiting trips are projected to be focused at the two existing ACPs. If additional access points are provided in the future, there would likely be a decrease in the trips at the two proposed ACPs.

Trip Assignment exhibits created using PTV Vistro software for all intersections within the study area can be found in **Appendix G**.

4.0 Analysis for Existing and Future Conditions

Existing and future conditions were evaluated using Synchro software to determine the impact of the proposed VA HCC on the signalized and unsignalized intersections within the study area. The opening year (and full build-out year) for the VA HCC is anticipated to be 2027, for purposes of this TIA. The Synchro analysis scenarios selected for this TIA are shown in **Table 4-1**.

Table 4-1. Fort Bliss VA HCC TIA Synchro Analysis Scenarios

Synchro Analysis Scenarios
2021 Existing
2027 Opening Year (No Build)
2027 Opening Year (Full Build-out)
2032 Future (5 Years After Opening Year)

Intersection delay (seconds/vehicle) and level of service (LOS) were used to evaluate the operation of signalized and unsignalized intersections within the study area. The *Highway Capacity Manual* (HCM) defines the LOS criteria for signalized and unsignalized intersections, on a scale from A to F, based on delay (seconds/vehicle). LOS A represents the best traffic flow conditions, and LOS F represents the worst traffic flow conditions. Typically, LOS D (or better) conditions are considered acceptable by local and state agencies prior to mitigation measures being considered. The HCM's LOS criteria is summarized in **Table 4-2**.

Table 4-2. Level of Service (LOS) Criteria

LOS	Signalized Intersection Delay (seconds/vehicle)	Unsignalized Intersection Delay (seconds/vehicle)	General Description
A	≤10	0 – 10	Free Flow
B	>10 – 20	>10 – 15	Stable Flow (slight delays)
C	>20 – 35	>15 – 25	Stable flow (acceptable delays)
D	>35 – 55	>25 – 35	Approaching unstable flow (tolerable delay)
E	>55 – 80	>35 – 50	Unstable flow (intolerable delay)
F	>80	>50	Forced flow (congested and queues fail to clear)

An analysis of intersection delay (seconds/vehicle) and LOS was performed for all signalized and unsignalized intersections within the study area for each of the four (4) analysis scenarios shown in **Table 4.1** using Synchro software. The intersection delay (seconds/vehicle) and LOS analysis results are summarized in table format for each analysis scenario, and the full Synchro summary reports are included in **Appendix H**.

4.1 2021 Existing Conditions

The 2021 Existing conditions utilize the TMCs collected in April 2021 (included in **Appendix E**), with an applied COVID-19 adjustment factor (1.04) to obtain peak hour volumes that are more comparable to pre-pandemic levels. The 2021 Existing volumes for the AM and PM Peak Hours at each study intersection are shown below in **Table 4.3**.

Table 4-3. 2021 Existing AM and PM Peak Hour Volumes

Location	AM Peak Hour Volume	PM Peak Hour Volume
Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue	506	392
Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue	636	543
Constitution Avenue and Iron Dustoff Drive	267	156
Iron Dustoff Drive and Iron Medics Drive	0	0
Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway)	2,915	3,084
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway)	2,182	1,195
Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive	6	12
Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive	5	55

The 2021 Existing peak hour volumes were entered into Synchro software, along with the existing lane configurations, traffic control type, and other variables, and the intersections were analyzed to obtain baseline approach delay and LOS results.

The 2021 Existing AM and PM peak hour approach delay and approach LOS for each intersection movement and the overall intersection LOS are shown in **Table 4-4**.

Table 4-4. 2021 Existing AM and PM Peak Hour Delay and LOS

Scenario	Delay (seconds/vehicle) and Level of Service by Movement												Intersection
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Spur 601 (Liberty Expressway) Eastbound Frontage Road (EBFR) & Constitution Avenue*													
AM Existing	-	39.9	0.2	4.2	1.1	-	31.6	31.6	1.8	-	-	-	12.4
	-	D	A	A	A	-	C	C	A	-	-	-	B
PM Existing	-	39.9	1.0	6.4	0.3	-	31.6	31.6	0.2	-	-	-	11.1
	-	D	A	A	A	-	C	C	A	-	-	-	B
Spur 601 (Liberty Expressway) Westbound Frontage Road (WBFR) & Constitution Avenue*													
AM Existing	42.3	2.5	-	-	39.4	12.8	-	-	-	9.8	9.8	0.2	15.4
	D	A	-	-	D	B	-	-	-	A	A	A	B
PM Existing	32.2	0.8	-	-	40.1	11.1	-	-	-	9.4	9.4	0	23.6
	C	A	-	-	D	B	-	-	-	A	A	A	C
Constitution Avenue & Iron Dustoff Drive													
AM Existing	8.4	7.8	-	7.8	7.3	-	8.2	7.7	-	7.9	6.9	-	7.8
	A	A	-	A	A	-	A	A	-	A	A	-	A
PM Existing	8.4	7.4	-	7.4	6.9	-	8.3	6.9	-	7.6	7.1	-	7.8
	A	A	-	A	A	-	A	A	-	A	A	-	A
Iron Dustoff Drive & Iron Medics Drive													
AM Existing	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
PM Existing	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
Loop 375 (Purple Heart Boulevard) Southbound Frontage Road (SBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	-	-	-	20.0	20.0	3.6	-	61.5	16.2	-	512.7	-	371.9
	-	-	-	B	B	A	-	E	B	-	F	-	F
PM Existing	-	-	-	-	0.3	-	-	44.4	496.2	-	124.0	-	335.6
	-	-	-	-	A	-	-	D	F	-	F	-	F
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road (NBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	659.0	-	0.0	-	-	-	-	9.7	-	-	38.5	2.3	562.1
	F	-	A	-	-	-	-	A	-		D	A	F
PM Existing	113.0	-	0.0	-	-	-	-	7.7	-	-	48.1	10.0	73.0
	F	-	A	-	-	-	-	A	-	-	D	B	E
Loop 375 (Purple Heart Boulevard) access road (North) & Iron Medics Drive													
AM Existing	-	8.6	-	-	-	-	-	-	-	-	-	-	2.9
	-	A	-	-	-	-	-	-	-	-	-	-	A
PM Existing	-	8.6	-	-	-	-	-	-	-	-	-	-	3.6
	-	A	-	-	-	-	-	-	-	-	-	-	A
Loop 375 (Purple Heart Boulevard) access road (South) & Iron Medics Drive													
AM Existing	-	-	-	-	-	-	-	8.5	-	-	-	-	5.1
	-	-	-	-	-	-	-	A	-	-	-	-	A
PM Existing	-	-	-	-	-	-	-	8.8	-	-	-	-	8.2
	-	-	-	-	-	-	-	A	-	-	-	-	A

**Signalized intersection*

4.2 2027 Opening Year (No Build) Conditions

The 2027 Opening Year (No Build) conditions utilize the COVID-19-adjusted TMCs collected in April 2021 (included in **Appendix E**), with an applied average annual growth rate (2%), as discussed previously in this report, to project future peak-hour volumes for the year that the proposed VA HCC is anticipated to open (this scenario evaluates the projected opening year to determine what the future conditions would be even without the VA HCC). The 2027 Opening Year (No Build) volumes for the AM and PM Peak Hours at each study intersection are shown below in **Table 4.5**.

Table 4-5. 2027 Opening Year (No Build) AM and PM Peak Hour Volumes

Location	AM Peak Hour Volume	PM Peak Hour Volume
Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue	579	445
Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue	724	617
Constitution Avenue and Iron Dustoff Drive	306	174
Iron Dustoff Drive and Iron Medics Drive	0	0
Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway)	3,345	3,539
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway)	2,502	1,370
Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive	6	15
Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive	5	63

The 2027 Opening Year (No Build) peak hour volumes were entered into Synchro software, along with the existing lane configurations, traffic control type, and other variables, and the intersections were analyzed to obtain baseline approach delay and LOS results.

The 2027 Opening Year (No Build) AM and PM peak hour approach delay and approach LOS for each intersection movement and the overall intersection LOS are shown in **Table 4-6**.

Table 4-6. 2027 Opening Year (No Build) AM and PM Peak Hour Delay and LOS

Scenario	Delay (seconds/vehicle) and Level of Service by Movement												Intersection
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Spur 601 (Liberty Expressway) Eastbound Frontage Road (EBFR) & Constitution Avenue*													
AM Existing	-	41.3	.2	4.3	1.1	-	33.1	33.2	3.1	-	-	-	13.2
	-	D	A	A	A	-	C	C	A	-	-	-	B
PM Existing	-	42.5	2.1	7.6	.2	-	33.1	32.9	.5	-	-	-	13.1
	-	D	A	A	A	-	C	C	A	-	-	-	B
Spur 601 (Liberty Expressway) Westbound Frontage Road (WBFR) & Constitution Avenue*													
AM Existing	41.0	1.6	-	-	41.4	12.8	-	-	-	9.8	9.9	-	15.6
	D	A	-	-	D	B	-	-	-	A	A	-	B
PM Existing	30.3	.4	-	-	41.3	10.7	-	-	-	10.6	10.6	-	23.9
	C	A	-	-	D	B	-	-	-	B	B	-	C
Constitution Avenue & Iron Dustoff Drive													
AM Existing	8.7	8.1	-	8.1	7.6	-	8.3	8.4	-	7.8	7.6	-	8.3
	A	A	-	A	A	-	A	A	-	A	A	-	A
PM Existing	8.9	7.7	-	7.8	7.3	-	8.5	7.4	-	8	7.8	-	8.1
	A	A	-	A	A	-	A	A	-	A	A	-	A
Iron Dustoff Drive & Iron Medics Drive													
AM Existing	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
PM Existing	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
Loop 375 (Purple Heart Boulevard) Southbound Frontage Road (SBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	-	-	-	20.0	20.0	3.5	-	62.0	16.8	-	626.6	-	453.5
	-	-	-	B	B	A	-	E	B	-	F	-	F
PM Existing	-	-	-	-	37.4	7.3	-	22.6	580.2	-	349.5	-	418.3
	-	-	-	-	D	A	-	C	F	-	F	-	F
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road (NBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	793.2	-	0.0	-	-	-	-	10.5	-	-	38.9	3.3	676.2
	F	-	A	-	-	-	-	B	-	-	D	A	F
PM Existing	313.7	37.6	6.2	-	-	-	-	3.8	-	-	109.8	9.6	178.9
	F	D	A	-	-	-	-	A	-	-	F	A	F
Loop 375 (Purple Heart Boulevard) access road (North) & Iron Medics Drive													
AM Existing	12	-	-	-	-	-	-	-	-	-	-	-	1.3
	B	-	-	-	-	-	-	-	-	-	-	-	A
PM Existing	10.4	-	-	-	-	-	-	-	-	-	-	-	3.5
	B	-	-	-	-	-	-	-	-	-	-	-	A
Loop 375 (Purple Heart Boulevard) access road (South) & Iron Medics Drive													
AM Existing	-	-	-	7.5	-	-	-	9.4	-	-	-	-	1.6
	-	-	-	A	-	-	-	A	-	-	-	-	A
PM Existing	-	-	-	7.9	-	-	-	9.4	-	-	-	-	1.8
	-	-		A	-	-	-	A	-	-	-	-	A

**Signalized intersection*

4.3 2027 Opening Year (Full Build-out) Conditions

The 2027 Opening Year (Full Build-out) conditions utilize the 2027 Opening Year (No Build) volumes, plus the trips projected to be generated by the proposed VA HCC, to project future peak hour volumes for the year that the proposed VA HCC is anticipated to open. The 2027 Opening Year (Full Build-out) volumes for the AM and PM Peak Hours at each study intersection are shown below in **Table 4.7**.

Table 4-7. 2027 Opening Year (Full Build-out) AM and PM Peak Hour Volumes

Location	AM Peak Hour Volume	PM Peak Hour Volume
Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue	636	502
Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue	740	633
Constitution Avenue and Iron Dustoff Drive	363	231
Iron Dustoff Drive and Iron Medics Drive	223	94
Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway)	3,428	3,622
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway)	2,584	1,452
Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive	255	264
Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive	438	496

The 2027 Opening Year (Full Build-out) peak hour volumes were entered into Synchro software, along with the existing lane configurations, traffic control type, and other variables, and the intersections were analyzed to obtain baseline approach delay and LOS results.

The 2027 Opening Year (Full Build-out) AM and PM peak hour approach delay and approach LOS for each intersection movement and the overall intersection LOS are shown in **Table 4-8**.

Table 4-8. 2027 Opening Year (Full Build-out) AM and PM Peak Hour Delay and LOS

Scenario	Delay (seconds/vehicle) and Level of Service by Movement												Intersection
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Spur 601 (Liberty Expressway) Eastbound Frontage Road (EBFR) & Constitution Avenue*													
AM Existing	-	41.8	.6	4.6	1.2	-	33.0	33.1	6.4	-	-	-	13.5
	-	D	A	A	A	-	C	C	A	-	-	-	B
PM Existing	-	42.5	2.1	7.6	.2	-	33.1	32.9	.5	-	-	-	13.1
	-	D	A	A	A	-	C	C	A	-	-	-	B
Spur 601 (Liberty Expressway) Westbound Frontage Road (WBFR) & Constitution Avenue*													
AM Existing	38.6	1.7	-	-	41.3	12.7	-	-	-	10.3	10.3	.3	15.9
	D	A	-	-	D	B	-	-	-	B	B	A	B
PM Existing	30.3	.4	-	-	41.3	10.7	-	-	-	10.6	10.6	-	23.9
	C	A	-	-	D	B	-	-	-	B	B	-	C
Constitution Avenue & Iron Dustoff Drive													
AM Existing	8.7	8.1	-	8.1	7.6	-	8.3	8.4	-	7.8	7.6	-	8.3
	A	A	-	A	A	-	A	A	-	A	A	-	A
PM Existing	8.9	7.7	-	7.8	7.3	-	8.5	7.4	-	8	7.8	-	8.1
	A	A	-	A	A	-	A	A	-	A	A	-	A
Iron Dustoff Drive & Iron Medics Drive													
AM Existing	-	-	-	6.9	-	-	-	-	-	-	-	6.1	6.8
	-	-	-	A	-	-	-	-	-	-	-	A	A
PM Existing	-	-	-	6.6	-	-	-	-	-	-	-	5.9	6.1
	-	-	-	A	-	-	-	-	-	-	-	A	A
Loop 375 (Purple Heart Boulevard) Southbound Frontage Road (SBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	-	-	-	20.5	21.0	3.4	-	62.7	17.0	-	661.0	-	473.2
	-	-	-	C	C	A	-	E	B	-	F	-	F
PM Existing	-	-	-	-	37.4	7.3	-	22.6	580.2	-	349.5	-	453.7
	-	-	-	-	D	A	-	C	F	-	F	-	F
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road (NBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	817.5	20.6	5.3	-	-	-	-	12.3	-	-	39.8	3.3	673.9
	F	C	A	-	-	-	-	B	-	-	D	A	F
PM Existing	313.7	37.6	6.2	-	-	-	-	3.8	-	-	109.8	9.6	178.9
	F	D	A	-	-	-	-	A	-	-	F	A	A
Loop 375 (Purple Heart Boulevard) access road (North) & Iron Medics Drive													
AM Existing	12	-	-	-	-	-	-	-	-	-	-	-	1.3
	B	-	-	-	-	-	-	-	-	-	-	-	A
PM Existing	10.4	-	-	-	-	-	-	-	-	-	-	-	3.5
	B	-	-	-	-	-	-	-	-	-	-	-	A
Loop 375 (Purple Heart Boulevard) access road (South) & Iron Medics Drive													
AM Existing	-	-	-	7.5	-	-	-	9.4	-	-	-	-	1.6
	-	-	-	A	-	-	-	A	-	-	-	-	A
PM Existing	-	-	-	7.9	-	-	-	9.4	-	-	-	-	1.8
	-	-		A	-	-	-	A	-	-	-	-	A

**Signalized intersection*

4.4 2032 Future (5 Years After Opening Year) Conditions

The 2032 Future (5 Years After Opening Year) conditions utilize the 2027 Opening Year (Full Build-out Year) volumes, with an applied average annual growth rate (2%), as discussed previously in this report, plus the trips projected to be generated by the proposed VA HCC, to project future peak hour volumes for 2032. The 2032 Future (5 Years After Opening Year) volumes for the AM and PM Peak Hours at each study intersection are shown below in **Table 4.9**.

Table 4-9. 2032 Future (5 Years After Opening) AM and PM Peak Hour Volumes

Location	AM Peak Hour Volume	PM Peak Hour Volume
Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue	772	624
Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue	848	728
Constitution Avenue and Iron Dustoff Drive	466	317
Iron Dustoff Drive and Iron Medics Drive	260	113
Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway)	3,942	4,163
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway)	2,990	1,711
Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive	531	540
Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive	927	993

The 2032 Future (5 Years After Opening Year) peak hour volumes were entered into Synchro software, along with the existing lane configurations, traffic control type, and other variables, and the intersections were analyzed to obtain baseline approach delay and LOS results.

The 2032 Future (5 Years After Opening Year) AM and PM peak hour approach delay and approach LOS for each intersection movement and the overall intersection LOS are shown in **Table 4-10**.

Table 4-10. 2032 Future (5 Years After Opening) AM and PM Peak Hour Delay and LOS

Scenario	Delay (seconds/vehicle) and Level of Service by Movement												Intersection
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Spur 601 (Liberty Expressway) Eastbound Frontage Road (EBFR) & Constitution Avenue*													
AM Existing	-	43.4	.7	4.6	1.1	-	32.7	32.7	7.6	-	-	-	13.9
	-	D	A	A	A	-	C	C	A	-	-	-	B
PM Existing	-	43.2	2.6	9.0	.2	-	32.1	32.2	1.2	-	-	-	13.8
	-	D	A	A	A	-	C	C	A	-	-	-	B
Spur 601 (Liberty Expressway) Westbound Frontage Road (WBFR) & Constitution Avenue*													
AM Existing	34.0	.9	-	-	40.6	11.9	-	-	-	11.5	11.5	.8	15.7
	C	A	-	-	D	B	-	-	-	B	B	A	B
PM Existing	26.9	.4	-	-	40.3	9.9	-	-	-	12.4	12.4	.1	23.0
	C	A	-	-	D	A	-	-	-	B	B	A	C
Constitution Avenue & Iron Dustoff Drive													
AM Existing	9.1	8.4	-	8.3	8	-	8.6	9.1	-	8.0	7.9	-	8.8
	A	A	-	A	A	-	A	A	-	A	A	-	A
PM Existing	9.3	7.9	-	8	7.6	-	8.8	7.8	-	8.3	8	-	8.4
	A	A	-	A	A	-	A	A	-	A	A	-	A
Iron Dustoff Drive & Iron Medics Drive													
AM Existing	-	-	-	10.6	-	-	-	-	-	-	-	6.4	10.2
	-	-	-	B	-	-	-	-	-	-	-	A	B
PM Existing	-	-	-	8.1	-	-	-	-	-	-	-	5.9	6.4
	-	-	-	A	-	-	-	-	-	-	-	A	A
Loop 375 (Purple Heart Boulevard) Southbound Frontage Road (SBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	-	-	-	25.4	28.2	.1	-	63.3	175.1	-	665.8	-	509.1
	-	-	-	C	C	A	-	E	F	-	F	-	F
PM Existing	-	-	-	37.0	38.9	-	-	22.8	791.7	-	475.1	-	637.0
	-	-	-	D	D	-	-	C	F	-	F	-	F
Loop 375 (Purple Heart Boulevard) Northbound Frontage Road (NBFR) & Spur 601 (Liberty Expressway)*													
AM Existing	1120.2	24.6	5.1	-	-	-	-	44.2	-	-	35.7	3.4	899.2
	F	C	A	-	-	-	-	D	-	-	D	A	F
PM Existing	401.2	37.9	9.5	-	-	-	-	4.3	-	-	119.5	9.3	215.3
	F	D	A	-	-	-	-	A	-	-	F	A	F
Loop 375 (Purple Heart Boulevard) access road (North) & Iron Medics Drive													
AM Existing	22.9	-	-	-	-	-	-	-	-	-	-	-	2.7
	C	-	-	-	-	-	-	-	-	-	-	-	A
PM Existing	18.6	-	-	-	-	-	-	-	-	-	-	-	3.9
	C	-	-	-	-	-	-	-	-	-	-	-	A
Loop 375 (Purple Heart Boulevard) access road (South) & Iron Medics Drive													
AM Existing	-	-	-	7.9	-	-	-	11.2	-	-	-	-	1.9
	-	-	-	A	-	-	-	B	-	-	-	-	A
PM Existing	-	-	-	8.3	-	-	-	11.4	-	-	-	-	2.2
	-	-	-	A	-	-	-	B	-	-	-	-	A

**Signalized intersection*

4.5 Potential Mitigation Measures for Intersections

The following off-site traffic mitigation measures could potentially be considered to minimize the impacts of the proposed VA HCC traffic on each of the following study intersections:

Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue:

- Modifying the existing traffic signal timing (optimization)
- Converting the southbound inside thru lane to an additional left turn lane (dual lefts), or to a shared thru/left turn lane. Note: eastbound receiving lanes would need to be adjusted (re-striped).

Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue:

- Modifying the existing traffic signal timing (optimization)
- Converting the northbound inside thru lane to an additional left turn lane (dual lefts), or to a shared thru/left turn lane. Note: westbound receiving lanes would need to be adjusted (re-striped).

Constitution Avenue and Iron Dustoff Drive:

- Changing the existing intersection control type from multi-way stop control to two-way stop control (for the eastbound and the westbound approaches) to allow the heavier northbound left turn movements to flow freely without stopping.
- Adding a channelized right turn lane with a raised concrete island on the eastbound approach to allow the eastbound right turn movements to flow freely without stopping (this can be done either in conjunction with the previous measure, or as a stand-alone measure).

Iron Dustoff Drive and Iron Medics Drive:

- Modifying the existing intersection control type from multi-way stop control to uncontrolled, since there are currently no vehicular conflicts (westbound traffic may turn northbound without conflicts, and southbound traffic may turn eastbound without conflicts). U-turns will have to be prohibited to prevent vehicular conflicts if the multi-way stop control is removed. Intersection control would have to be re-instated when the existing stub-out to the south connects to a roadway.
- Adding a channelized right turn lane with a raised concrete island on the westbound approach to allow the westbound right turn movements to flow freely without stopping (this should not be done in conjunction with the previous measure, but rather as a stand-alone measure, after the existing stub-out to the south connects to a roadway).

Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway):

- Modifying the existing traffic signal timing (optimization)
- Extending the storage length for the right turn lanes on the eastbound approach
- Adding a third thru lane on the westbound approach of the DDI

Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway):

- Modifying the existing traffic signal timing (optimization)
- Adding a third left turn lane on the northbound approach of the DDI

Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive:

- No mitigation measures are necessary resulting from the VA HCC traffic (a roundabout could be considered for this intersection if the traffic volumes and delays ever become excessive).

Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive:

- No mitigation measures are necessary resulting from the VA HCC traffic (this intersection could be considered for a traffic signal warrant study if the traffic volumes and delays ever become excessive).

Other intersections:

Constitution Avenue and Constitution Avenue:

- Modifying the existing intersection control type from multi-way stop control to uncontrolled, since there are no vehicular conflicts at this intersection (westbound traffic may turn northbound without conflicts, and southbound traffic may turn eastbound without conflicts). U-turns will have to be prohibited to prevent vehicular conflicts if the multi-way stop control is removed. Intersection control would have to be re-instated when the existing stub-out to the south connects to a roadway.

4.6 Access Management

Access management analysis is a common component of most TIAs. Since the proposed VA HCC site will ultimately be served by the surrounding TxDOT roadways, TxDOT's *Access Management Manual* (July 2011) was referenced in the evaluation of the proposed VA HCC for compliance with recommended access management criteria.

Access management analysis for the proposed VA HCC site was not performed as extensively as desirable, because there was no detailed site plan available at the time that this TIA was being completed. As a result, items that are typically included in an access management analysis (such as access point spacing, and the need for auxiliary lanes and channelization measures) could not be evaluated.

The proposed VA HCC is anticipated to be served by the two existing access control points (ACPs). Both ACPs are located on roadways internal to Fort Bliss (not a part of the TxDOT system), therefore there are no existing or proposed facilities that fall within applicability for compliance with TxDOT *Access Management Manual* access management criteria.

4.7 Vehicular Queuing Analysis for ACPs

Vehicular queuing (the formation of a line while waiting) occurs when demand exceeds capacity for a period at a specific location. Queuing can be experienced at intersections, toll plazas, parking facilities, freeway bottlenecks, incident sites, and merge areas.

A vehicular queuing analysis was included in this TIA because the proposed VA HCC site will be served primarily by the two existing ACPs. Fort Bliss staff stationed at the ACPs will carry out occupant identification and vehicle inspection procedures to determine whether access will be granted to each arriving vehicle. The north ACP is located east of the intersection of Constitution Avenue and Iron Dustoff Drive and currently has two lanes. The north ACP also serves as the commercial vehicle access point. The south ACP is located on the north side of Iron Medics Drive directly south of the proposed VA HCC site and currently has three lanes. The south ACP also has a visitor control center and is not expected to provide access to commercial vehicles.

According to information from the Corps of Engineers, each lane at a typical ACP has the capacity to process 350 vehicles per hour. Projected peak hour volumes for the 2027 Opening Year (Full Build-out) scenario were used to analyze the ability of the existing lanes at each ACP to handle traffic loads, and to determine how many additional lanes would be required, if any, at each ACP, based on traffic projections. From the ITE trip generation data calculated for the existing WBAMC and for the proposed VA HCC, only the "entering" trips were used for the worst-case peak hour scenario, the AM peak hour used for analysis (6:45-7:45 AM). Trip distribution used was 40% to the north ACP, and 60% to the south ACP.

The results of the queuing analysis show that the exiting number of lanes can handle the projected traffic for the WBAMC and the VA HCC, as long as both lanes are operating at the north ACP, and at least two lanes are operating at the south ACP during the AM peak. **Table 4.11** shows the results of the queuing analysis for the south ACP and **Table 4.12** shows the results of the queuing analysis for the north ACP.

Table 4-11. Vehicular Queuing Analysis for the South ACP

Time (AM)	Arrival Volume	Arrival %	Arrival Rate (vehicles/ minute)	Service Rate (vehicles/ minute)	Queue Buildup (vehicles/ minute)	Queue Buildup During the Period (vehicles/ 5 minutes)	Cumulative Queue (vehicles)
6:45–6:50	54	9.1%	11	17.50	-6.7	-33.4	-33.4
6:50–6:55	38	6.4%	8	17.50	-9.9	-49.6	-83.1
6:55–7:00	44	7.4%	9	17.50	-8.7	-43.3	-126.4
7:00–7:05	54	9.1%	11	17.50	-6.7	-33.4	-159.8
7:05–7:10	55	9.2%	11	17.50	-6.5	-32.5	-192.3
7:10–7:15	59	10.0%	12	17.50	-5.6	-28.0	-220.3
7:15–7:20	59	10.0%	12	17.50	-5.6	-28.0	-248.3
7:20–7:25	41	7.0%	8	17.50	-9.2	-46.0	-294.4
7:25–7:30	38	6.4%	8	17.50	-9.9	-49.6	-344.0
7:30–7:35	53	8.9%	11	17.50	-6.9	-34.3	-378.3
7:30–7:40	49	8.2%	10	17.50	-7.8	-38.8	-417.2
7:40–7:45	50	8.5%	10	17.50	-7.4	-37.0	-454.2

Table 4-12. Vehicular Queuing Analysis for the North ACP

Time (AM)	Arrival Volume	Arrival %	Arrival Rate (vehicles/ minute)	Service Rate (vehicles/ minute)	Queue Buildup (vehicles/ minute)	Queue Buildup During the Period (vehicles/ 5 minutes)	Cumulative Queue (vehicles)
6:45–6:50	36	9.1%	7	11.67	-4.5	-22.3	-22.3
6:50–6:55	25	6.4%	5	11.67	-6.6	-33.1	-55.4
6:55–7:00	29	7.4%	6	11.67	-5.8	-28.9	-84.3
7:00–7:05	36	9.1%	7	11.67	-4.5	-22.3	-106.5
7:05–7:10	37	9.2%	7	11.67	-4.3	-21.7	-128.2
7:10–7:15	40	10.0%	8	11.67	-3.7	-18.7	-146.9
7:15–7:20	40	10.0%	8	11.67	-3.7	-18.7	-165.6
7:20–7:25	28	7.0%	6	11.67	-6.1	-30.7	-196.3
7:25–7:30	25	6.4%	5	11.67	-6.6	-33.1	-229.4
7:30–7:35	35	8.9%	7	11.67	-4.6	-22.9	-252.2
7:30–7:40	32	8.2%	6	11.67	-5.2	-25.9	-278.1
7:40–7:45	34	8.5%	7	11.67	-4.9	-24.7	-302.8

4.8 Parking Analysis and Internal Site Circulation

Because a detailed site plan was not available at the time that this TIA report was completed, the parking analysis for the proposed Fort Bliss VA HCC was based on the anticipated 500,000 Sq. Ft. of building area.

4.8.1 Parking Analysis

Parking generation calculations were performed for the proposed 500,000 Sq. Ft. VA HCC using the Institute of Transportation Engineers (ITE) *Parking Generation Manual*, 5th edition. ITE Land Use Code 610 – *Hospital* was used. Trips were calculated versus the proposed gross floor area (GFA) for a Weekday (Monday – Friday) using the fitted curve equation. **Table 4-13** shows the Weekday (Monday – Friday) Parking Generation. The calculated parking demand for the proposed 500,000 Sq. Ft VA HCC is approximately 1,114 spaces.

Table 4-13. Weekday (Monday – Friday) Parking Generation

ITE Code	Land Use	Gross Floor Area, GFA (Sq. Ft)	Time Period	Peak Period of Parking Demand	Average Rate (per 1,000 Sq. Ft. GFA)	Fitted Curve Equation	Calculated Parking Demand
610	Hospital	500,000 (X = 500)	Weekday (Monday – Friday)	9:00 AM – 4:00 PM	2.22	P = 2.15(X) + 38.98	1,114

The ITE *Parking Generation Manual*, 5th ed. provides a table with time-of-day distribution of parking demand on a weekday based on 29 study sites from all over the United States. The line chart, shown in **Figure 4-1,** was created using the table data to graphically present the time-of-day distribution for parking demand on a weekday to give an idea of what may be expected for the proposed VA HCC.

Figure 4-1. Time of Day Distribution for Parking Demand

For comparative purposes, the City of El Paso parking requirements were calculated for Land Use 6.05 - Hospital, for the proposed 500,000 Sq. Ft. VA HCC. **Table 4-14** shows the minimum and maximum number of parking spaces based of GFA.

Table 4-14. City of El Paso Parking Requirements

Land Use Code	Land Use	Gross Floor Area, GFA (Sq. Ft)	Minimum Parking Ratio	Maximum Parking Ratio	Minimum Parking (spaces)	Maximum Parking (spaces)
6.05	Hospital	500,000	1/576 Sq. Ft. GFA	1/400 Sq. Ft. GFA	869	1,250

As can be seen, the calculated parking demand of 1,114 spaces (from the ITE *Parking Generation Manual*) falls nearly halfway between the 869 minimum and 1,250 maximum parking spaces (from the City of El Paso's parking requirements). The proposed VA HCC is anticipated to have approximately 1,500 surface parking spaces. The proposed 1,500 parking spaces should be sufficient since the proposed number of parking spaces is well above the calculated parking requirements shown in **Table 4-13** and **Table 4-14**.

Lastly, based on the City of El Paso's parking requirements, approximately 18 accessible parking stalls would be required based on the minimum number of parking spaces (869) shown in **Table 4-14**. Of those 18 accessible parking stalls, at least 3 would be required to be van-accessible parking stalls. Similarly, approximately 23 accessible parking stalls would be required based on the maximum number of parking spaces (1,250) shown in **Table 4-14**. Of those 23 accessible parking stalls, at least 4 would be required to be van-accessible parking stalls. Based on the proposed VA HCC land use, the VA may choose to provide more accessible (and van-accessible) parking stalls than the City of El Paso's minimum requirements.

4.8.2 Internal Site Circulation

Typically, the internal site circulation of a proposed development is analyzed for safety and efficiency as part of a TIA. Because a detailed site plan was not available at the time that this TIA report was completed, the internal site circulation can only be analyzed for the existing roadways within the study area that will serve the proposed VA HCC.

The proposed VA HCC site is located immediately east of the existing WBAMC. The WBAMC has an existing internal roadway network that ultimately connects to the existing ACPs along Iron Medics Drive (to the south) and along Iron Dustoff Drive (to the northwest). Without a detailed site plan, it can only be projected that traffic for the VA HCC will use the existing perimeter road that surrounds all the existing parking lots for the WBAMC.

When designing new access connections to an existing roadway, it is always desirable to align the new access connections to existing roadways or aisles, or to off-set the access connections, to minimize the number of vehicular conflict points. The existing WBAMC parking lot has multiple internal roadways that could potentially be used to aid in the placement selection of proposed aisles and internal roadways during the design of a detailed site plan for the VA HCC.

5.0 Conclusions and Recommendations

Cobb, Fendley & Associates, Inc. was asked to perform a traffic impact analysis (TIA) for the proposed Fort Bliss Veterans Affairs Health Care Center (VA HCC), located in El Paso, Texas. The proposed facility would consist of an approximately 500,000-square-foot (Sq. Ft.) VA health care center located on an approximately 30-acre site, plus minor real estate to support utilities, support services, and parking on the Fort Bliss Garrison adjacent to and southeast of the new William Beaumont Army Medical Center (WBAMC) on Fort Bliss.

The development's opening year (full build-out year) is anticipated to be 2027 for the purpose of this analysis. This traffic impact analysis examined the AM and PM Peak Hours for the following scenarios:

- 2021 Existing
- 2027 Opening Year (No Build)
- 2027 Opening Year (Full Build-out)
- 2032 (5 Years After Opening Year)

Intersection delay and level of service (LOS) for existing and future conditions were evaluated using Synchro software to determine the impact of the proposed VA HCC on the intersections within the study area. The following off-site traffic mitigation measures could potentially be considered to minimize the impacts of the proposed VA HCC traffic on each of the following study intersections:

Spur 601 (Liberty Expressway) Eastbound Frontage Road and Constitution Avenue:

- Modifying the existing traffic signal timing (optimization)
- Converting the southbound inside thru lane to an additional left turn lane (dual lefts), or to a shared thru/left turn lane. Note: eastbound receiving lanes would need to be adjusted (re-striped).

Spur 601 (Liberty Expressway) Westbound Frontage Road and Constitution Avenue:

- Modifying the existing traffic signal timing (optimization)
- Converting the northbound inside thru lane to an additional left turn lane (dual lefts), or to a shared thru/left turn lane. Note: westbound receiving lanes would need to be adjusted (re-striped).

Constitution Avenue and Iron Dustoff Drive:

- Changing the existing intersection control type from multi-way stop control to two-way stop control (for the eastbound and the westbound approaches) to allow the heavier northbound left turn movements to flow freely without stopping.
- Adding a channelized right turn lane with a raised concrete island on the eastbound approach to allow the eastbound right turn movements to flow freely without stopping (this can be done either in conjunction with the previous measure, or as a stand-alone measure).

Iron Dustoff Drive and Iron Medics Drive:

- Modifying the existing intersection control type from multi-way stop control to uncontrolled, since there are currently no vehicular conflicts (westbound traffic may turn northbound without conflicts, and southbound traffic may turn eastbound without conflicts). U-turns will have to be prohibited to prevent vehicular conflicts if the multi-way stop control is removed. Intersection control would have to be re-instated when the existing stub-out to the south connects to a roadway.
- Adding a channelized right turn lane with a raised concrete island on the westbound approach to allow the westbound right turn movements to flow freely without stopping (this should not be done in conjunction with the previous measure, but rather as a stand-alone measure, after the existing stub-out to the south connects to a roadway).

Loop 375 (Purple Heart Boulevard) Southbound Frontage Road and Spur 601 (Liberty Expressway):

- Modifying the existing traffic signal timing (optimization)

- Extending the storage length for the right turn lanes on the eastbound approach
- Adding a third thru lane on the westbound approach of the DDI

Loop 375 (Purple Heart Boulevard) Northbound Frontage Road and Spur 601 (Liberty Expressway):

- Modifying the existing traffic signal timing (optimization)
- Adding a third left turn lane on the northbound approach of the DDI

Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive:

- No mitigation measures are necessary resulting from the VA HCC traffic (a roundabout could be considered for this intersection if the traffic volumes and delays ever become excessive).

Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive:

- No mitigation measures are necessary resulting from the VA HCC traffic (this intersection could be considered for a traffic signal warrant study if the traffic volumes and delays ever become excessive).

Other intersections:

Constitution Avenue and Constitution Avenue:

- Modifying the existing intersection control type from multi-way stop control to uncontrolled, since there are no vehicular conflicts at this intersection (westbound traffic may turn northbound without conflicts, and southbound traffic may turn eastbound without conflicts). U-turns will have to be prohibited to prevent vehicular conflicts if the multi-way stop control is removed. Intersection control would have to be re-instated when the existing stub-out to the south connects to a roadway.

Because there was no detailed site plan available at the time that this TIA was being completed, items that are typically included in an access management analysis (such as access point spacing, and the need for auxiliary lanes and channelization measures) could not be evaluated. The proposed VA HCC is anticipated to be served by the two existing access control points (ACPs). Both ACPs are located on roadways internal to Fort Bliss (not a part of the TxDOT system), therefore there are no existing or proposed facilities that fall within applicability for compliance with TxDOT *Access Management Manual* access management criteria.

A vehicular queuing analysis was completed for the two existing ACPs. The north ACP is located east of the intersection of Constitution Avenue and Iron Dustoff Drive and currently has two lanes. The south ACP is located on the north side of Iron Medics Drive directly south of the proposed VA HCC site and currently has three lanes. The north ACP is projected to carry approximately 40% of the VA HCC's generated trips, and the south ACP is projected to carry approximately 60% of the VA HCC's generated trips. This uneven trip distribution was selected because the north ACP serves as the commercial vehicle access point, and the south ACP has a visitor control center. Projected peak hour volumes for the 2027 Opening Year (Full Build-out) scenario were used to analyze the ability of the existing lanes at each ACP to handle traffic loads, and to determine how many additional lanes would be required, if any, at each ACP, based on traffic projections. The results of the queuing analysis show that the exiting number of lanes can handle the projected traffic for the WBAMC and the VA HCC, if both lanes are operating at the north ACP, and at least two lanes (out of three) are operating at the south ACP during the AM peak. To minimize delays, it is recommended that all lanes at each ACP remain in operation during the AM peak.

Parking generation calculations were performed using two methods: the Institute of Transportation Engineers (ITE) *Parking Generation Manual*, 5th edition, and the City of El Paso's parking requirements. The calculated parking demand of 1,114 spaces (from the ITE *Parking Generation Manual*) falls between the 869 minimum and 1,250 maximum parking spaces (from the City of El Paso's parking requirements). The proposed VA HCC is anticipated to have approximately 1,500 surface parking spaces. The proposed 1,500 parking spaces should be sufficient since the proposed number of parking spaces is well above the

calculated parking requirements. Based on the City of El Paso's parking requirements, approximately 18 accessible parking stalls would be required based on the minimum number of parking spaces (869). Of those 18 accessible parking stalls, at least 3 would be required to be van-accessible parking stalls. Similarly, approximately 23 accessible parking stalls would be required based on the maximum number of parking spaces (1,250). Of those 23 accessible parking stalls, at least 4 would be required to be van-accessible parking stalls. Based on the proposed VA HCC land use, it is recommended that more accessible (and van-accessible) parking stalls be provided rather than simply aiming to comply with the City of El Paso's minimum requirements.

Typically, the internal site circulation of a proposed development is analyzed for safety and efficiency as part of a TIA. Because a detailed site plan was not available at the time that this TIA report was completed, the internal site circulation was only analyzed for the existing roadways within the study area that will serve the proposed VA HCC. The proposed VA HCC site is located immediately east of the existing WBAMC. The WBAMC has an existing internal roadway network that ultimately connects to the existing ACPs along Iron Medics Drive (to the south) and along Iron Dustoff Drive (to the northwest). Without a detailed site plan, it can only be projected that traffic for the VA HCC will use the existing perimeter road that surrounds all the existing parking lots for the WBAMC. When designing new access connections to an existing roadway, it is recommended to align the new access connections to existing roadways or aisles, or to off-set the access connections, to minimize the number of vehicular conflict points. The existing WBAMC parking lot has multiple internal roadways that could potentially be used to aid in the placement selection of proposed aisles and internal roadways during the design of a detailed site plan for the VA HCC.

A City of El Paso Code of Ordinances

Chapter 19.18 - TRAFFIC IMPACT ANALYSIS

Sections:

19.18.010 - Purpose and applicability.

A. Purposes and findings.

1. New development must be served and supported by an adequate network of streets and thoroughfares.
2. Streets and thoroughfares are an essential component of the city's street network and are necessary to accommodate the continuing growth and development of the city.
3. It is necessary and desirable to obtain rights-of-way for off-site, abutting and internal thoroughfares to support new development at the time of platting, rezoning or development of the land.
4. The purpose of the provisions within this chapter are to ensure that both development impacts on off-site and on-site thoroughfare rights-of-way are mitigated through contributions and/or improvements of thoroughfare rights-of-way and that new development does not contribute more than their proportionate share of costs or construction of thoroughfare rights-of-way and only contribute that which is necessary and attributable to their development.
5. It is the city's intent to assure that dedication of thoroughfare and street rights-of-way and their construction requirements are proportional to the traffic demands created by a new development.
6. It is the intent of the city that a road adequacy determination be made concurrent with consideration and approval of rezoning applications and development applications.

B. Applicability.

1. A traffic impact analysis (TIA), in adherence to standards contained within this title and City of El Paso approved guidelines, shall be required under the following criteria:
   a. For all proposed developments within the city limits and within the city's extraterritorial jurisdiction where the development is expected to generate traffic in excess of one thousand average daily trips.
   b. If a development project will generate more than one hundred peak hour trips.
2. The number of trips generated by the proposed development shall be based on land uses and intensities according to the latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual or locally approved trip generation rates. The daily trip generation rate shall be computed based upon the maximum land use intensity allowed under the proposed new zoning.
3. Exceptions. An applicant may request that the city manager or designee waive the requirement for a TIA. The requirement for a TIA may be waived under the following criteria:
   a. The city manager or designee determine that a TIA is not needed due to traffic analysis or traffic studies already completed; or
   b. Improvements are already, constructed that will serve and support the new development; or
4. An applicant may request to the city manager or designee that the submittal of the traffic impact analysis be deferred to the subdivision stage of the development; the request shall be approved provided that the following requirements are met:
   a. The property proposed for rezoning has not yet been platted; and
   b. The proposed development generates less than five hundred peak hour trips.

5. Alternative method of calculating traffic impact.
    a. In lieu of a traffic impact analysis, the developer or applicant may request that the city accept an alternative method of calculating the impact that the new development will have on traffic and thoroughfare rights-of-way.
    b. Factors to consider in determining whether to accept an alternate method of calculating the traffic impact are:
        (1) The proposed development generates less than five hundred peak hour trips; and
        (2) The existing roadway segments within ½-mile radius level of service is an A, B, C, or D, based on the latest version of the Highway Capacity Manual; and
        (3) Existing intersections within ½-mile radius level of service is an A, B, C, or D based on the latest version of the Highway Capacity Manual; and
        (4) There are no existing safety problems (sight distance, high crash incidence rate, etc.)
        (5) Whether the data used in the calculation is no older than one year.
    c. Upon review and analysis of the data and information provided by the applicant or developer, the city manager or designee may accept the calculation and base any mitigation required or proportionate share or contribution on the calculations submitted by the developer.

(Ord. 16882 § 2 (part), 2008)

(Ord. No. 17236, § 27, 11-10-2009; Ord. No. 17251, § 10, 12-15-2009; Ord. No. 17739, § 1, 3-6-2012; Ord. No. 18649, §§ 1, 2, 3-21-2017)

19.18.020 - Standards for and timing of traffic impact analysis.

A. TIA and update required. A TIA shall be submitted with a zoning application, a preliminary plat or with the land study. If previously submitted, an updated TIA shall also be submitted with the final plat if substantial changes have been made from the preliminary plat, and shall be generally consistent with the TIA submitted with the preliminary plat. The initial TIA may also be updated whenever the plan for the proposed development is modified to authorize more intensive development.

B. Contents.
    1. The TIA on a land study (or preliminary plat or zoning application if no land study is provided) shall identify or determine the following:
        a. Trips to be generated by the proposed development trip generation shall be calculated using the latest edition of ITE's Trip Generation Manual or trip generation rates approved by the City of El Paso;
        b. Distribution and assignment of such trips to the road network analyzed;
        c. The capacity of affected thoroughfares before and after the proposed development. Capacity shall be quantified by level-of-service based on the latest version of the Highway Capacity Manual. The volume to capacity ratio (v/c) shall be included in the level-of-service tables. The capacity analysis shall include the AM and PM peak hours, twenty-four-hour, and special times or days of the week dependant of the land use's peak traffic generating time periods as determined from the latest version of ITE's Trip Generation Manual. Additional factors such as pedestrian trips, bicycles, and mass transit as possibly mitigating vehicle trip counts shall be considered where warranted;
        d. Deficient thoroughfares or roadways shall be determined based upon the minimum acceptable

level-of-service as put forth in the following table:

Table 19.18-1. Required Minimum Acceptable Level-of-Service (Roadways)

		Level-of-Service Without Proposed Development					
Proposed Developed Projected Level-of-Service		A	B	C	D	E	F
	A	A	-	-	-	-	-
	B	B	B	-	-	-	-
	C	B	C	C	-	-	-
	D	B	C	C	[A] D	-	-
	E	B	C	C	[A] D	[AB] E	-
	F	B	C	C	[A] D	[AB] E	[AB] F

[A] The city may choose to participate in roadway improvements to restore a minimum level-of-service C.

[B] In cases where the level-of-service of the roadway network without development is below a level-of-service D the proposed development shall not increase roadway intersection delay. The city manager or designee may deem that the proposed development cannot be supported by the existing roadway network.

e. The development project's proportionate share of the costs of such thoroughfares and modifications including rights-of-way.

2. The TIA on a preliminary plat and a zoning application (or building permit if not submitted previously, or final plat if no preliminary is provided) shall identify or determine the following:
   a. Turning movements at intersections, access points and median breaks;
   b. Analysis of median breaks, ingress and egress and all intersections, including a queue analysis, for both AM and PM peak hours and special times or days of the week dependant of the land use's peak traffic generating time periods as determined from the latest version of ITE's Trip Generation Manual;
   c. The capacity of affected intersections before and after the proposed development shall be reported, based on the latest version of the Highway Capacity Manual, adjusted to reflect existing signal timing plans. The volume to capacity ratio (v/c) shall be included in the intersection level-of-service tables;
   d. Deficient intersections and capacity. Deficient intersections shall be determined based upon the minimum acceptable level-of-service as put forth in the following table:

Table 19.18-2. Required Minimum Acceptable Level-of-Service (Intersections)

		Level-of-Service Without Proposed Development					
Proposed Developed Projected Level-of-Service		A	B	C	D	E	F
	A	A	-	-	-	-	-
	B	B	B	-	-	-	-
	C	B	C	C	-	-	-
	D	B	C	C	[A] D	-	-
	E	B	C	C	[A] D	[AB] E	-
	F	B	C	C	[A] D	[AB] E	[AB] F

[A] The city may choose to participate in roadway improvements to restore a minimum level-of-service C.

[B] In cases where the level-of-service of the roadway network without development is below a level-of-service D the proposed development shall not increase roadway intersection delay. The city manager or designee may deem that the proposed development cannot be supported by the existing roadway network.

e. Specific recommendations for thoroughfare, intersection, and roadway improvements and traffic control modifications and other traffic improvements to mitigate the traffic from the proposed development (any proposed signal timing must include the entire coordinated system not just intersections within the TIA study area);

f. The development project's proportionate share of the costs of such improvements and modifications including rights-of-way; and

g. Specific recommendations including but not limited to bus turnouts, auxiliary lanes, traffic calming, location of access points, location of median cuts, parking lot layout and site distance.

3. The method of preparing the TIA shall be as approved by the city traffic engineer.

C. Capital improvements plan for roads. The capacity of a thoroughfare may be considered adequate for purposes of a TIA if a needed improvement is included, funded, and approved in the city's, county's or state's two-year capital improvements plan for roads, or, if the improvement is included, funded, and approved in the city's, county's or state's three- to five-year capital improvements plan for roads, provided that the applicant agrees to phase development to conform to such scheduled improvement. This chapter shall not be construed to prevent the city from requiring dedication of rights-of-way for such roads, or from assigning trips to such roads in a TIA in order to determine a development project's proportionate costs of improvements.

D. Use intensity table. Where a proposed plat application does not designate the land use or intensity of use

proposed for the development, for purposes of ascertaining the applicability of this chapter and the trips to be generated, the city may utilize typical uses and intensities of use. For land to be developed for nonresidential or multiple-family use in the city's extraterritorial jurisdiction, the city may utilize uses and intensities of use that are typical in the most intensive zoning district that authorizes the type of use proposed in the development.

(Ord. 16882 § 2 (part), 2008)

(Ord. No. 17739, § 2, 3-6-2012)

19.18.030 - Criteria for determining traffic impact analysis requirements.

Scope. The scope of a traffic impact analysis is an analysis of the area surrounding the development that will be impacted by the development to determine the range of area that must be included in the TIA. The scope of the traffic impact analysis shall be based on the peak hour trips projected to be generated by the proposed development, as set forth in the following table. Additionally, a scoping meeting shall be coordinated with the city manager or designee in order to determine the study intersections within the scope of the TIA.

Table 19.18-3: Criteria for Determining Traffic Impact Analysis

Peak Hour Trips	TIA Analysis Period	TIA Scope
99 or less	1. n/a	Not Required
100—500	1. Existing	The frontage of the property, all access points (including common access), and all intersections within a ½ mile radius of the proposed development.
	2. Opening year	
	3. Full build-out year	
501—1000	1. Existing	The frontage of the property, all access points (including common access), and all intersections within a 1 mile radius of the proposed development.
	2. Opening year	
	3. Full build-out year	
	4. 5 years after opening year	
1,000 or more	1. Existing	The frontage of the property, all access points (including common access), and all intersections within a 1 1/2 mile radius of the proposed development.
	2. Opening year	
	3. Full build-out year	
	4. 5 years after opening year	

	5. 10 years after opening year	NOTE: All measurements shall be made from property boundaries.

(Ord. 16882 § 2 (part), 2008)

(Ord. No. 17739, § 1, 3-6-2012)

19.18.040 - City evaluation and action.

A. Criteria.

1. The city manager or designee shall evaluate the adequacy of the TIA prepared by the applicant. Based upon such evaluation, the city manager, or designee shall make recommendations concerning:
   a. Whether the application may be approved in the absence of dedication of rights-of-way or construction of improvements to each affected thoroughfare; and
   b. The extent of the applicant's obligations to make such dedications or improvements.
2. The city manager, or designee may recommend, and the decision-maker on the application may attach, conditions to the approval of the development application, based on one or more of the following performances by the applicant:
   a. Delay or phasing of development until thoroughfares with adequate capacity or intersection improvements are constructed;
   b. A reduction in the density or intensity of the proposed development sufficient to assure that the road network has adequate capacity to accommodate the additional traffic to be generated by the development;
   c. The dedication or construction of thoroughfares or traffic control improvements needed to mitigate the traffic impacts generated by the proposed development; or
   d. Any combination of techniques that assures that the traffic impacts of the development will be mitigated.

B. Deferral of obligation. Upon request of the applicant or property owner, the obligation to dedicate or improve thoroughfare rights-of-way or to make intersection improvements imposed on a development application may be deferred until the city's action on a subordinate (i.e., subsequent) development application. As a condition of deferring the obligation to dedicate rights-of-way for or to improve thoroughfares, the deferral shall be at the sole discretion of the city. The city shall require the developer to execute a subdivision improvement agreement (see Section 19.08.020) acceptable to the city attorney specifying the amount and timing of the rights-of-way dedication or improvements to thoroughfares.

(Ord. 16882 § 2 (part), 2008)

(Ord. No. 17739, § 1, 3-6-2012)

B Site Visit Photos

Photo 1: Northbound approach at the intersection of Spur 601 (Liberty Expressway) and Constitution Avenue

Photo 2: Southbound approach at the intersection Spur 601 (Liberty Expressway) and Constitution Avenue

Photo 3: Eastbound approach at the intersection Spur 601 (Liberty Expressway) and Constitution Avenue

Photo 4: Westbound approach at the intersection Spur 601 (Liberty Expressway) and Constitution Avenue

Photo 5: Eastbound approach at the intersection of Iron Dustoff Drive and Constitution Avenue

Photo 6: Southbound approach at the intersection of Iron Dustoff Drive and Constitution Avenue

Photo 7: Southbound approach at the intersection of Iron Dustoff Drive and Iron Medics Drive

Photo 8: Westbound approach at the intersection of Iron Dustoff Drive and Iron Medics Drive

Photo 9: Northbound approach at the intersection of Spur 601 (Liberty Expressway) and Loop 375 (Purple Heart Boulevard)

Photo 10: Southbound approach at the intersection of Spur 601 (Liberty Expressway) and Loop 375 (Purple Heart Boulevard)

Photo 11: Eastbound approach at the intersection of Spur 601 (Liberty Expressway) and Loop 375 (Purple Heart Boulevard)

Photo 12: Westbound approach at the intersection of Spur 601 (Liberty Expressway) and Loop 375 (Purple Heart Boulevard)

Photo 13: Northwest-bound approach at the intersection of Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive

Photo 14: Northeast-bound approach at the intersection of Loop 375 (Purple Heart Boulevard) access road (North) and Iron Medics Drive

Photo 15: Eastbound approach at the intersection of Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive

Photo 16: Southbound approach at the intersection of Loop 375 (Purple Heart Boulevard) access road (South) and Iron Medics Drive

C City of El Paso Major Thoroughfare Plan (MTP)

Viewer Map

May 26, 2021

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

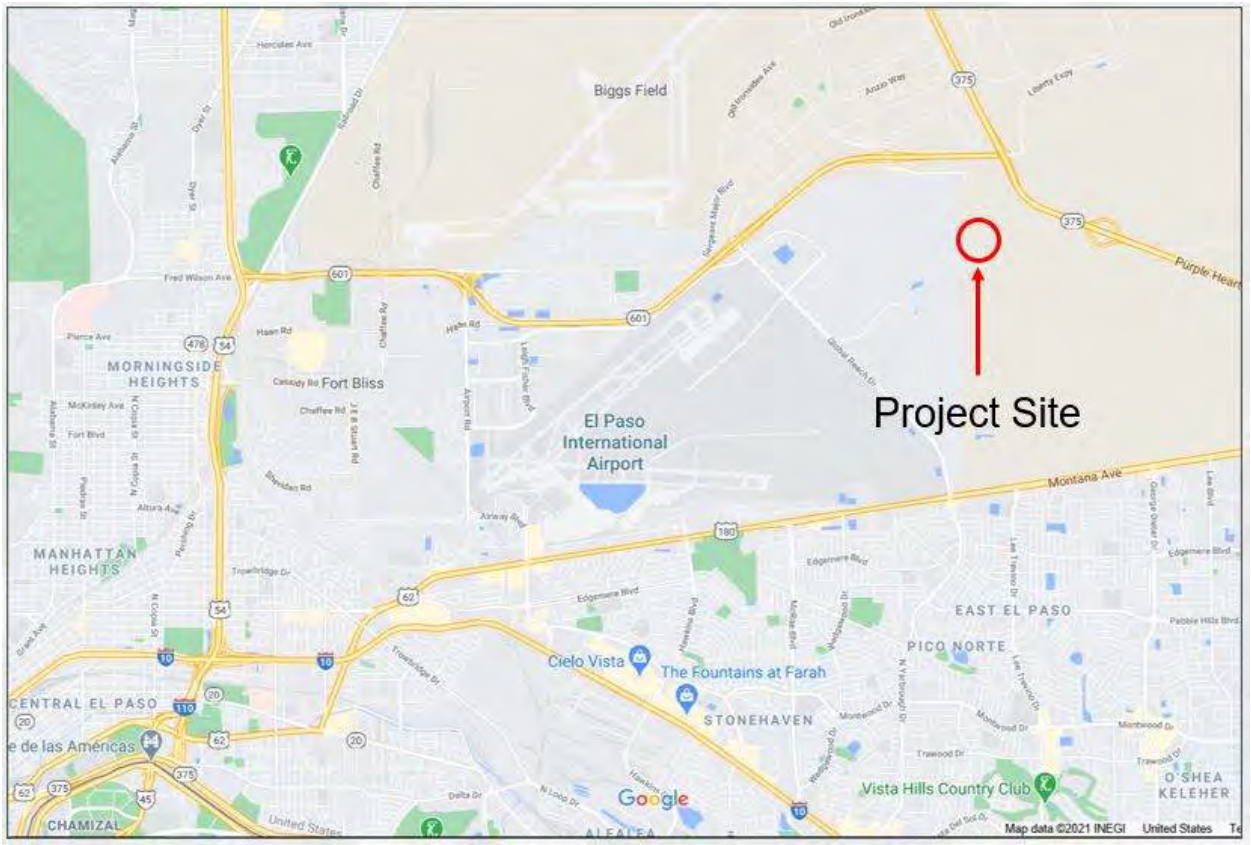
EPCenterline
- Interstate/Highways
- Freeways/Expressways
- Freeways/Expressways - Proposed
- Super Arterials
- Super Arterials - Proposed
- Major Arterials
- Major Arterials - Proposed
- Minor Arterials
- Minor Arterials - Proposed
- Collectors
- Collectors - Proposed

MTP2025
- Interstate/Highways

City of El Paso, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, NGA, USGS

Me
Copyright 2019

D Site Location Maps


Project Site
Biggs Field
El Paso International Airport
Fort Bliss
MORNINGSIDE HEIGHTS
MANHATTAN HEIGHTS
CENTRAL EL PASO
CHAMIZAL
EAST EL PASO
PICO NORTE
STONEHAVEN
O'SHEA KELEHER
Cielo Vista
The Fountains at Farah
Vista Hills Country Club
Montana Ave
Purple Heart
Google
Map data ©2021 INEGI United States


LP 375 (Purple Heart Blvd.)
Liberty Expy.
SP 601 (Liberty Expy.)
Constitution Ave.
Iron Dustoff Dr.
Proposed Site
LP 375 (Purple Heart Blvd.)
Iron Medics Dr.
LEGEND
Existing Traffic Signal
Intersections Analyzed

E Turning Movement Counts (TMCs)

EBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827867, Location: 31.84039, -106.34203

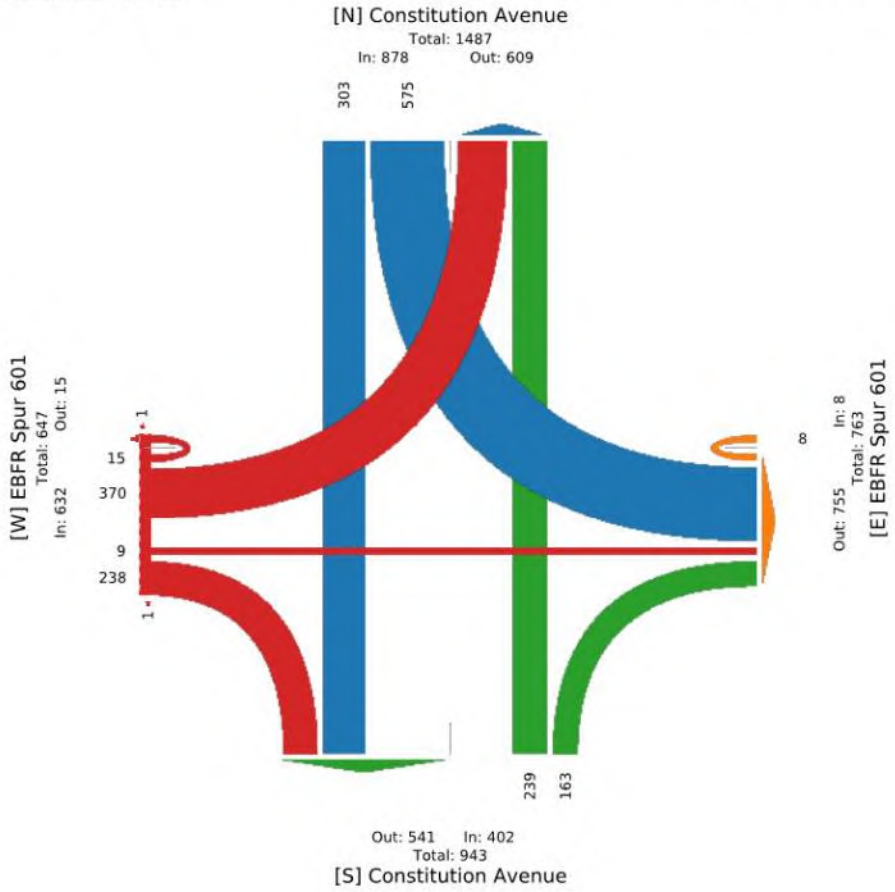
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Constitution Avenue Northbound						Constitution Avenue Southbound						EBFR Spur 601 Eastbound						EBFR Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 6:00AM	0	3	0	0	3	0	1	8	0	0	9	0	27	0	6	3	36	0	0	0	0	0	0	0	48
6:15AM	0	8	2	0	10	0	9	18	0	0	27	0	35	0	12	2	49	0	0	0	0	0	0	0	86
6:30AM	0	14	3	0	17	0	19	27	0	0	46	0	61	0	21	0	82	0	0	0	0	0	0	0	145
6:45AM	0	11	1	0	12	0	27	39	0	0	66	0	49	0	25	0	74	0	0	0	0	0	0	0	152
Hourly Total	0	36	6	0	42	0	56	92	0	0	148	0	172	0	64	5	241	0	0	0	0	0	0	0	431
7:00AM	0	9	2	0	11	0	27	20	0	0	47	0	29	1	15	0	45	0	0	0	0	1	1	0	104
7:15AM	0	9	3	0	12	0	30	30	0	0	60	0	25	0	27	2	54	0	0	0	0	0	0	0	126
7:30AM	0	7	5	0	12	0	28	24	0	0	52	0	17	0	24	0	41	0	0	0	0	0	0	0	105
7:45AM	0	8	0	0	8	0	11	18	0	0	29	0	7	0	24	0	31	0	0	0	0	0	0	0	68
Hourly Total	0	33	10	0	43	0	96	92	0	0	188	0	78	1	90	2	171	0	0	0	0	1	1	0	403
8:00AM	0	12	7	0	19	0	4	23	0	0	27	0	6	0	12	0	18	0	0	0	0	0	0	0	64
8:15AM	0	11	11	0	22	0	6	10	0	0	16	0	6	1	9	1	17	0	0	0	0	2	2	0	57
8:30AM	0	10	4	0	14	0	5	7	0	0	12	0	9	0	8	0	17	0	0	0	0	0	0	0	43
8:45AM	0	12	6	0	18	0	4	11	0	0	15	0	12	0	14	0	26	0	0	0	0	0	0	0	59
Hourly Total	0	45	28	0	73	0	19	51	0	0	70	0	33	1	43	1	78	0	0	0	0	2	2	0	223
4:00PM	0	23	34	0	57	0	26	3	0	0	29	0	3	0	3	0	6	0	0	0	0	0	0	0	92
4:15PM	0	11	11	0	22	0	38	2	0	0	40	0	2	2	5	1	10	0	0	0	0	0	0	0	72
4:30PM	0	9	12	0	21	0	83	10	0	0	93	0	5	2	6	0	13	0	0	0	0	1	1	0	128
4:45PM	0	16	7	0	23	0	29	15	0	0	44	0	3	0	5	1	9	0	0	0	0	2	2	0	78
Hourly Total	0	59	64	0	123	0	176	30	0	0	206	0	13	4	19	2	38	0	0	0	0	3	3	0	370
5:00PM	0	10	19	0	29	0	35	7	0	0	42	0	7	0	2	0	9	2	0	0	0	0	0	0	80
5:15PM	0	14	12	0	26	0	37	7	0	0	44	0	12	2	6	1	21	0	0	0	0	0	0	0	91
5:30PM	0	10	7	0	17	0	29	6	0	0	35	0	10	1	2	0	13	0	0	0	0	0	0	0	65
5:45PM	0	5	2	0	7	0	24	6	0	0	30	0	7	0	2	3	12	0	0	0	0	0	0	0	49
Hourly Total	0	39	40	0	79	0	125	26	0	0	151	0	36	3	12	4	55	2	0	0	0	0	0	0	285
6:00PM	0	14	8	0	22	0	43	4	0	0	47	0	4	0	5	1	10	0	0	0	0	2	2	0	81
6:15PM	0	6	3	0	9	0	27	3	0	0	30	0	6	0	3	0	9	0	0	0	0	0	0	0	48
6:30PM	0	5	1	0	6	0	22	1	0	0	23	0	13	0	0	0	13	0	0	0	0	0	0	0	42
6:45PM	0	2	3	0	5	0	11	4	0	0	15	0	15	0	2	0	17	0	0	0	0	0	0	0	37
Hourly Total	0	27	15	0	42	0	103	12	0	0	115	0	38	0	10	1	49	0	0	0	0	2	2	0	208
Total	0	239	163	0	402	0	575	303	0	0	878	0	370	9	238	15	632	2	0	0	0	8	8	0	1920
% Approach	0%	59.5%	40.5%	0%	-	-	65.5%	34.5%	0%	0%	-	-	58.5%	1.4%	37.7%	2.4%	-	-	0%	0%	0%	100%	-	-	-
% Total	0%	12.4%	8.5%	0%	**20.9%**	-	29.9%	15.8%	0%	0%	**45.7%**	-	19.3%	0.5%	12.4%	0.8%	**32.9%**	-	0%	0%	0%	0.4%	**0.4%**	-	-
Lights	0	231	161	0	**392**	-	567	299	0	0	**866**	-	360	9	235	15	**619**	-	0	0	0	7	7	-	1884
% Lights	0%	96.7%	98.8%	0%	**97.5%**	-	98.6%	98.7%	0%	0%	**98.6%**	-	97.3%	100%	98.7%	100%	**97.9%**	-	0%	0%	0%	87.5%	**87.5%**	-	98.1%
Articulated Trucks	0	0	0	0	**0**	-	1	0	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	1	**1**	-	2
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0.2%	0%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	12.5%	**12.5%**	-	0.1%
Buses and Single-Unit Trucks	0	8	2	0	**10**	-	7	4	0	0	**11**	-	10	0	3	0	**13**	-	0	0	0	0	**0**	-	34
% Buses and Single-Unit Trucks	0%	3.3%	1.2%	0%	**2.5%**	-	1.2%	1.3%	0%	0%	**1.3%**	-	2.7%	0%	1.3%	0%	**2.1%**	-	0%	0%	0%	0%	**0%**	-	1.8%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

EBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827867, Location: 31.84039, -106.34203

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



EBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
AM Peak (6:30 AM - 7:30 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827867, Location: 31.84039, -106.34203

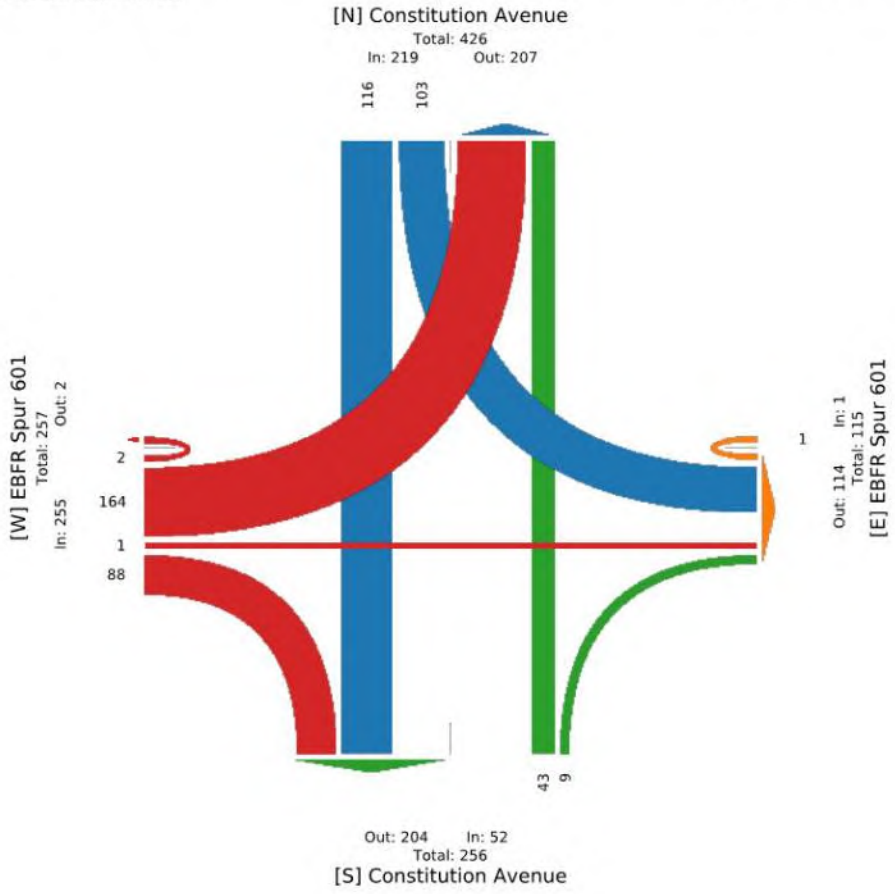
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Constitution Avenue Northbound						Constitution Avenue Southbound						EBFR Spur 601 Eastbound						EBFR Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 6:30AM	0	14	3	0	**17**	0	19	27	0	0	**46**	0	61	0	21	0	**82**	0	0	0	0	0	**0**	0	**145**
6:45AM	0	11	1	0	**12**	0	27	39	0	0	**66**	0	49	0	25	0	**74**	0	0	0	0	0	**0**	0	**152**
7:00AM	0	9	2	0	**11**	0	27	20	0	0	**47**	0	29	1	15	0	**45**	0	0	0	0	1	**1**	0	**104**
7:15AM	0	9	3	0	**12**	0	30	30	0	0	**60**	0	25	0	27	2	**54**	0	0	0	0	0	**0**	0	**126**
Total	0	43	9	0	**52**	0	103	116	0	0	**219**	0	164	1	88	2	**255**	0	0	0	0	1	**1**	0	**527**
% Approach	0%	82.7%	17.3%	0%	-	-	47.0%	53.0%	0%	0%	-	-	64.3%	0.4%	34.5%	0.8%	-	-	0%	0%	0%	100%	-	-	-
% Total	0%	8.2%	1.7%	0%	**9.9%**	-	19.5%	22.0%	0%	0%	**41.6%**	-	31.1%	0.2%	16.7%	0.4%	**48.4%**	-	0%	0%	0%	0.2%	**0.2%**	-	-
PHF	-	0.768	0.750	-	**0.765**	-	0.858	0.744	-	-	**0.830**	-	0.672	0.250	0.815	0.250	**0.777**	-	-	-	-	0.250	**0.250**	-	0.867
Lights	0	42	8	0	**50**	-	102	116	0	0	**218**	-	161	1	86	2	**250**	-	0	0	0	0	**0**	-	518
% Lights	0%	97.7%	88.9%	0%	**96.2%**	-	99.0%	100%	0%	0%	**99.5%**	-	98.2%	100%	97.7%	100%	**98.0%**	-	0%	0%	0%	0%	**0%**	-	98.3%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	1	**1**	-	1
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	100%	**100%**	-	0.2%
Buses and Single-Unit Trucks	0	1	1	0	**2**	-	1	0	0	0	**1**	-	3	0	2	0	**5**	-	0	0	0	0	**0**	-	8
% Buses and Single-Unit Trucks	0%	2.3%	11.1%	0%	**3.8%**	-	1.0%	0%	0%	0%	**0.5%**	-	1.8%	0%	2.3%	0%	**2.0%**	-	0%	0%	0%	0%	**0%**	-	1.5%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk, L: Left, R: Right, T: Thru, U: U-Turn

EBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
AM Peak (6:30 AM - 7:30 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827867, Location: 31.84039, -106.34203

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



EBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
PM Peak (4:30 PM - 5:30 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827867, Location: 31.84039, -106.34203

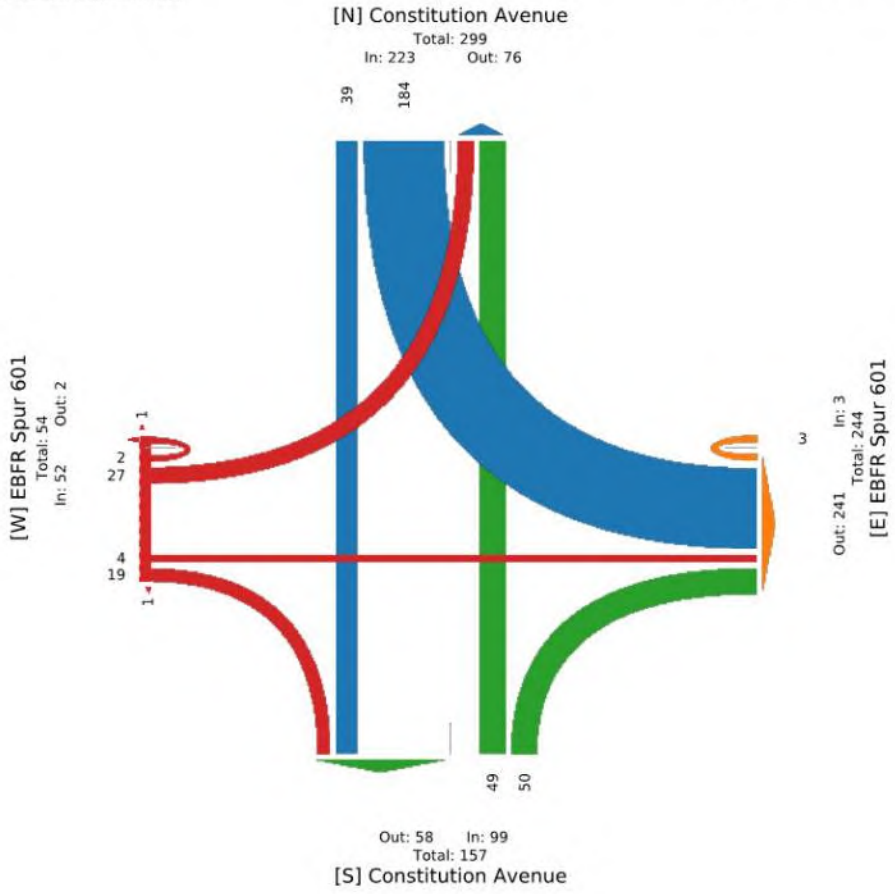
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Constitution Avenue Northbound						Constitution Avenue Southbound						EBFR Spur 601 Eastbound						EBFR Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 4:30PM	0	9	12	0	**21**	0	83	10	0	0	**93**	0	5	2	6	0	**13**	0	0	0	0	1	**1**	0	**128**
4:45PM	0	16	7	0	**23**	0	29	15	0	0	**44**	0	3	0	5	1	**9**	0	0	0	0	2	**2**	0	**78**
5:00PM	0	10	19	0	**29**	0	35	7	0	0	**42**	0	7	0	2	0	**9**	1	0	0	0	0	**0**	0	**80**
5:15PM	0	14	12	0	**26**	0	37	7	0	0	**44**	0	12	2	6	1	**21**	0	0	0	0	0	**0**	0	**91**
Total	0	49	50	0	**99**	0	184	39	0	0	**223**	0	27	4	19	2	**52**	2	0	0	0	3	**3**	0	**377**
% Approach	0%	49.5%	50.5%	0%	-	-	82.5%	17.5%	0%	0%	-	-	51.9%	7.7%	36.5%	3.8%	-	-	0%	0%	0%	100%	-	-	-
% Total	0%	13.0%	13.3%	0%	**26.3%**	-	48.8%	10.3%	0%	0%	**59.2%**	-	7.2%	1.1%	5.0%	0.5%	**13.8%**	-	0%	0%	0%	0.8%	**0.8%**	-	-
PHF	-	0.766	0.658	-	**0.853**	-	0.554	0.650	-	-	**0.599**	-	0.563	0.500	0.792	0.500	**0.619**	-	-	-	-	0.375	**0.375**	-	0.736
Lights	0	48	50	0	**98**	-	183	38	0	0	**221**	-	25	4	19	2	**50**	-	0	0	0	3	**3**	-	372
% Lights	0%	98.0%	100%	0%	**99.0%**	-	99.5%	97.4%	0%	0%	**99.1%**	-	92.6%	100%	100%	100%	**96.2%**	-	0%	0%	0%	100%	**100%**	-	98.7%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Buses and Single-Unit Trucks	0	1	0	0	**1**	-	1	1	0	0	**2**	-	2	0	0	0	**2**	-	0	0	0	0	**0**	-	5
% Buses and Single-Unit Trucks	0%	2.0%	0%	0%	**1.0%**	-	0.5%	2.6%	0%	0%	**0.9%**	-	7.4%	0%	0%	0%	**3.8%**	-	0%	0%	0%	0%	**0%**	-	1.3%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	7	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

EBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
PM Peak (4:30 PM - 5:30 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827867, Location: 31.84039, -106.34203

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



WBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827868, Location: 31.841369, -106.342055

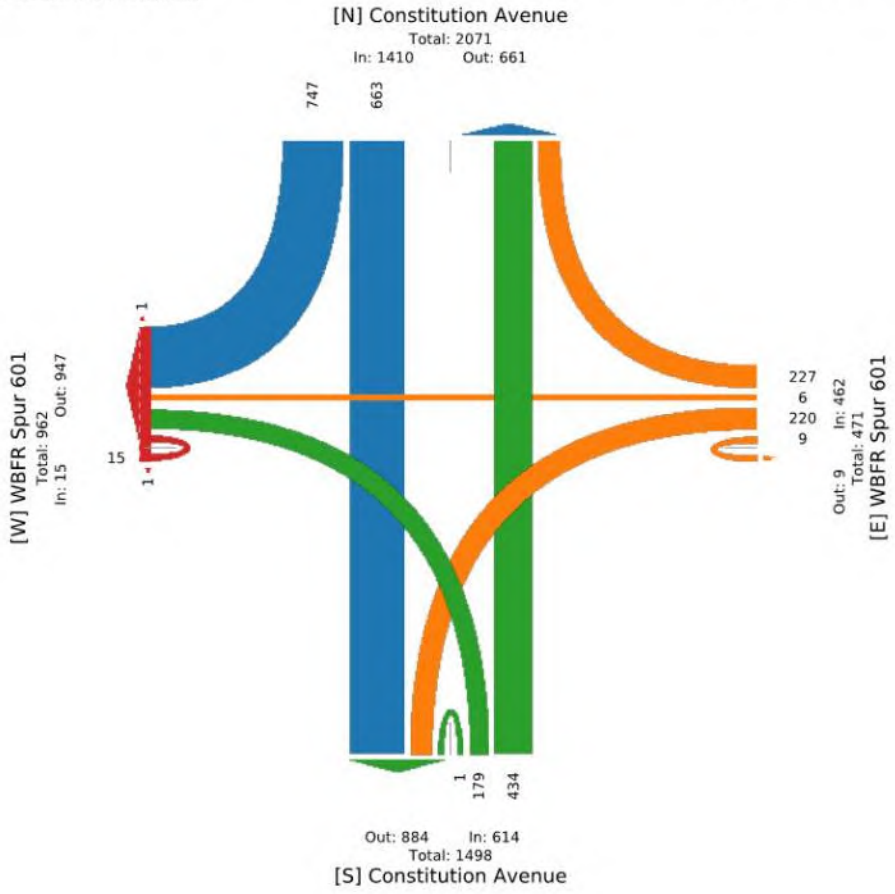
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Constitution Avenue Northbound						Constitution Avenue Southbound						WBFR Spur 601 Eastbound						WBFR Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 6:00AM	2	28	0	0	30	0	0	2	22	0	24	0	0	0	0	3	3	0	10	0	31	0	41	0	98
6:15AM	3	43	0	0	46	0	0	10	12	0	22	0	0	0	0	2	2	0	15	2	24	0	41	0	111
6:30AM	10	68	0	0	78	0	0	24	31	0	55	0	0	0	0	0	0	0	32	0	28	0	60	0	193
6:45AM	5	56	0	0	61	0	0	30	21	0	51	0	0	0	0	0	0	0	28	0	31	0	59	0	171
Hourly Total	20	195	0	0	215	0	0	66	86	0	152	0	0	0	0	5	5	0	85	2	114	0	201	0	573
7:00AM	6	27	0	0	33	0	0	35	44	0	79	0	0	0	0	0	0	0	20	0	23	1	44	0	156
7:15AM	7	27	0	0	34	0	0	35	53	0	88	0	0	0	0	2	2	0	19	0	10	0	29	0	153
7:30AM	2	20	0	1	23	0	0	33	46	0	79	0	0	0	0	0	0	0	17	1	11	1	30	0	132
7:45AM	7	8	0	0	15	0	0	15	28	0	43	0	0	0	0	0	0	0	15	0	4	0	19	0	77
Hourly Total	22	82	0	1	105	0	0	118	171	0	289	0	0	0	0	2	2	0	71	1	48	2	122	0	518
8:00AM	9	9	0	0	18	0	0	7	19	0	26	0	0	0	0	0	0	0	19	0	1	0	20	0	64
8:15AM	7	12	0	0	19	0	0	7	16	0	23	0	0	0	0	1	1	0	8	0	4	2	14	0	57
8:30AM	5	12	0	0	17	0	0	7	10	0	17	0	0	0	0	0	0	0	5	0	5	0	10	0	44
8:45AM	11	16	0	0	27	0	0	6	13	0	19	0	0	0	0	0	0	0	11	0	8	0	19	0	65
Hourly Total	32	49	0	0	81	0	0	27	58	0	85	0	0	0	0	1	1	0	43	0	18	2	63	0	230
4:00PM	22	4	0	0	26	0	0	28	19	0	47	0	0	0	0	0	0	0	1	1	1	0	3	0	76
4:15PM	10	2	0	0	12	0	0	38	35	0	73	0	0	0	0	1	1	0	2	0	1	0	3	0	89
4:30PM	7	7	0	0	14	0	0	89	61	0	150	0	0	0	0	0	0	0	7	0	1	2	10	0	174
4:45PM	12	6	0	0	18	0	0	39	48	0	87	0	0	0	0	1	1	0	3	0	3	1	7	0	113
Hourly Total	51	19	0	0	70	0	0	194	163	0	357	0	0	0	0	2	2	0	13	1	6	3	23	0	452
5:00PM	10	9	0	0	19	0	0	41	58	0	99	0	0	0	0	0	0	2	1	0	1	0	2	0	120
5:15PM	12	13	0	0	25	0	0	42	36	0	78	0	0	0	0	1	1	0	2	1	8	0	11	0	115
5:30PM	10	10	0	0	20	0	0	33	40	0	73	0	0	0	0	0	0	0	2	0	6	0	8	0	101
5:45PM	3	10	0	0	13	0	0	30	31	0	61	0	0	0	0	3	3	0	3	0	4	0	7	0	84
Hourly Total	35	42	0	0	77	0	0	146	165	0	311	0	0	0	0	4	4	2	8	1	19	0	28	0	420
6:00PM	9	7	0	0	16	0	0	43	28	0	71	0	0	0	0	1	1	0	0	0	4	2	6	0	94
6:15PM	4	9	0	0	13	0	0	30	33	0	63	0	0	0	0	0	0	0	0	0	5	0	5	0	81
6:30PM	5	15	0	0	20	0	0	23	19	0	42	0	0	0	0	0	0	0	0	1	4	0	5	0	67
6:45PM	1	16	0	0	17	0	0	16	24	0	40	0	0	0	0	0	0	0	0	0	9	0	9	0	66
Hourly Total	19	47	0	0	66	0	0	112	104	0	216	0	0	0	0	1	1	0	0	1	22	2	25	0	308
Total	179	434	0	1	614	0	0	663	747	0	1410	0	0	0	0	15	15	2	220	6	227	9	462	0	2501
% Approach	29.2%	70.7%	0%	0.2%	-		0%	47.0%	53.0%	0%	-		0%	0%	0%	100%	-		47.6%	1.3%	49.1%	1.9%	-		-
% Total	7.2%	17.4%	0%	0%	24.6%		0%	26.5%	29.9%	0%	56.4%		0%	0%	0%	0.6%	0.6%		8.8%	0.2%	9.1%	0.4%	18.5%		-
Lights	174	420	0	1	595		0	654	741	0	1395		0	0	0	15	15		217	6	221	8	452		2457
% Lights	97.2%	96.8%	0%	100%	96.9%		0%	98.6%	99.2%	0%	98.9%		0%	0%	0%	100%	100%		98.6%	100%	97.4%	88.9%	97.8%		98.2%
Articulated Trucks	0	0	0	0	0		0	1	0	0	1		0	0	0	0	0		0	0	1	1	2		3
% Articulated Trucks	0%	0%	0%	0%	0%		0%	0.2%	0%	0%	0.1%		0%	0%	0%	0%	0%		0%	0%	0.4%	11.1%	0.4%		0.1%
Buses and Single-Unit Trucks	5	14	0	0	19		0	8	6	0	14		0	0	0	0	0		3	0	5	0	8		41
% Buses and Single-Unit Trucks	2.8%	3.2%	0%	0%	3.1%		0%	1.2%	0.8%	0%	1.0%		0%	0%	0%	0%	0%		1.4%	0%	2.2%	0%	1.7%		1.6%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	100%	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	0%	-	-	-	-	-		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

WBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827868, Location: 31.841369, -106.342055

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



WBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
AM Peak (6:30 AM - 7:30 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827868, Location: 31.841369, -106.342055

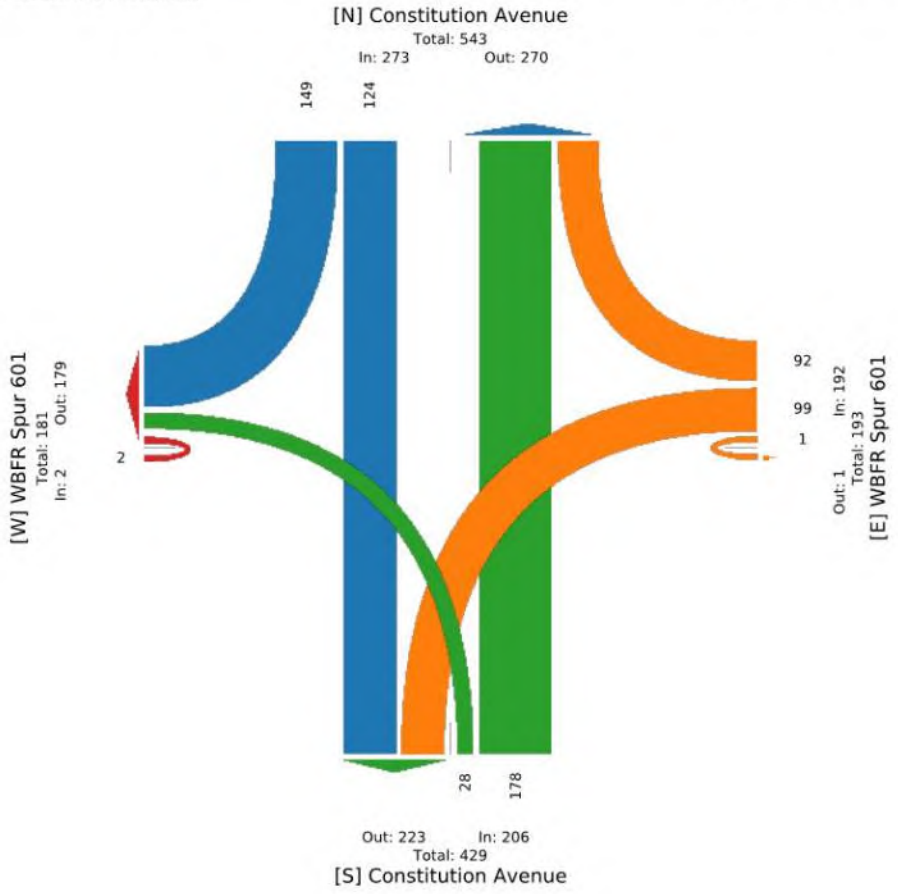
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Constitution Avenue						Constitution Avenue						WBFR Spur 601						WBFR Spur 601						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int.
2021-04-21 6:30AM	10	68	0	0	**78**	0	0	24	31	0	**55**	0	0	0	0	0	**0**	0	32	0	28	0	**60**	0	**193**
6:45AM	5	56	0	0	**61**	0	0	30	21	0	**51**	0	0	0	0	0	**0**	0	28	0	31	0	**59**	0	**171**
7:00AM	6	27	0	0	**33**	0	0	35	44	0	**79**	0	0	0	0	0	**0**	0	20	0	23	1	**44**	0	**156**
7:15AM	7	27	0	0	**34**	0	0	35	53	0	**88**	0	0	0	0	2	**2**	0	19	0	10	0	**29**	0	**153**
Total	28	178	0	0	**206**	0	0	124	149	0	**273**	0	0	0	0	2	**2**	0	99	0	92	1	**192**	0	**673**
% Approach	13.6%	86.4%	0%	0%	-	-	0%	45.4%	54.6%	0%	-	-	0%	0%	0%	100%	-	-	51.6%	0%	47.9%	0.5%	-	-	-
% Total	4.2%	26.4%	0%	0%	**30.6%**	-	0%	18.4%	22.1%	0%	**40.6%**	-	0%	0%	0%	0.3%	**0.3%**	-	14.7%	0%	13.7%	0.1%	**28.5%**	-	-
PHF	0.700	0.654	-	-	**0.660**	-	-	0.886	0.703	-	**0.776**	-	-	-	-	0.250	**0.250**	-	0.773	-	0.742	0.250	**0.800**	-	0.872
Lights	27	175	0	0	**202**	-	0	123	148	0	**271**	-	0	0	0	2	**2**	-	98	0	91	0	**189**	-	664
% Lights	96.4%	98.3%	0%	0%	**98.1%**	-	0%	99.2%	99.3%	0%	**99.3%**	-	0%	0%	0%	100%	**100%**	-	99.0%	0%	98.9%	0%	**98.4%**	-	98.7%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	1	**1**	-	1
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	100%	**0.5%**	-	0.1%
Buses and Single-Unit Trucks	1	3	0	0	**4**	-	0	1	1	0	**2**	-	0	0	0	0	**0**	-	1	0	1	0	**2**	-	8
% Buses and Single-Unit Trucks	3.6%	1.7%	0%	0%	**1.9%**	-	0%	0.8%	0.7%	0%	**0.7%**	-	0%	0%	0%	0%	**0%**	-	1.0%	0%	1.1%	0%	**1.0%**	-	1.2%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk, L: Left, R: Right, T: Thru, U: U-Turn

WBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
AM Peak (6:30 AM - 7:30 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827868, Location: 31.841369, -106.342055

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



WBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
PM Peak (4:30 PM - 5:30 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827868, Location: 31.841369, -106.342055

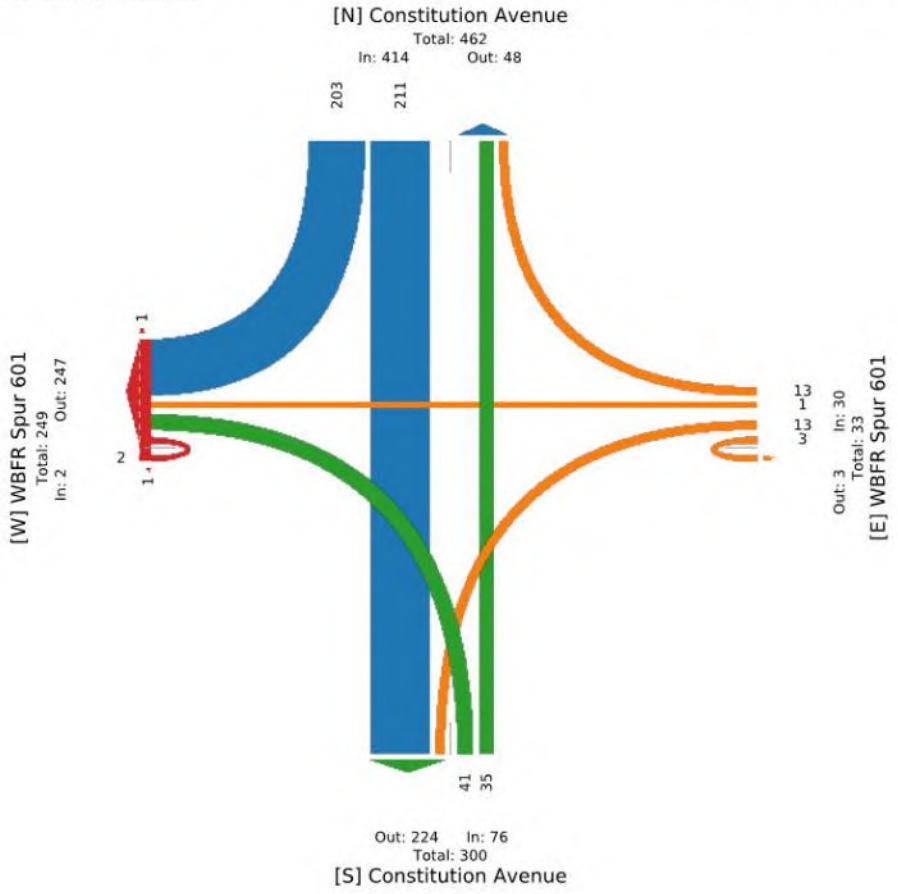
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Constitution Avenue Northbound						Constitution Avenue Southbound						WBFR Spur 601 Eastbound						WBFR Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 4:30PM	7	7	0	0	**14**	0	0	89	61	0	**150**	0	0	0	0	0	**0**	0	7	0	1	2	**10**	0	**174**
4:45PM	12	6	0	0	**18**	0	0	39	48	0	**87**	0	0	0	0	1	**1**	0	3	0	3	1	**7**	0	**113**
5:00PM	10	9	0	0	**19**	0	0	41	58	0	**99**	0	0	0	0	0	**0**	2	1	0	1	0	**2**	0	**120**
5:15PM	12	13	0	0	**25**	0	0	42	36	0	**78**	0	0	0	0	1	**1**	0	2	1	8	0	**11**	0	**115**
Total	41	35	0	0	**76**	0	0	211	203	0	**414**	0	0	0	0	2	**2**	2	13	1	13	3	**30**	0	**522**
% Approach	53.9%	46.1%	0%	0%	-	-	0%	51.0%	49.0%	0%	-	-	0%	0%	0%	100%	-	-	43.3%	3.3%	43.3%	10.0%	-	-	-
% Total	7.9%	6.7%	0%	0%	**14.6%**	-	0%	40.4%	38.9%	0%	**79.3%**	-	0%	0%	0%	0.4%	**0.4%**	-	2.5%	0.2%	2.5%	0.6%	**5.7%**	-	-
PHF	0.854	0.673	-	-	**0.760**	-	-	0.593	0.832	-	**0.690**	-	-	-	-	0.500	**0.500**	-	0.464	0.250	0.406	0.375	**0.682**	-	0.750
Lights	41	32	0	0	**73**	-	0	210	201	0	**411**	-	0	0	0	2	**2**	-	13	1	13	3	**30**	-	516
% Lights	100%	91.4%	0%	0%	**96.1%**	-	0%	99.5%	99.0%	0%	**99.3%**	-	0%	0%	0%	100%	**100%**	-	100%	100%	100%	100%	**100%**	-	98.9%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Buses and Single-Unit Trucks	0	3	0	0	**3**	-	0	1	2	0	**3**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	6
% Buses and Single-Unit Trucks	0%	8.6%	0%	0%	**3.9%**	-	0%	0.5%	1.0%	0%	**0.7%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	1.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

WBFR Spur 601 at Constitution Avenue - TMC
Wed Apr 21, 2021
PM Peak (4:30 PM - 5:30 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827868, Location: 31.841369, -106.342055

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Constitution Ave at Iron Dustoff Dr - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827865, Location: 31.838933, -106.3304

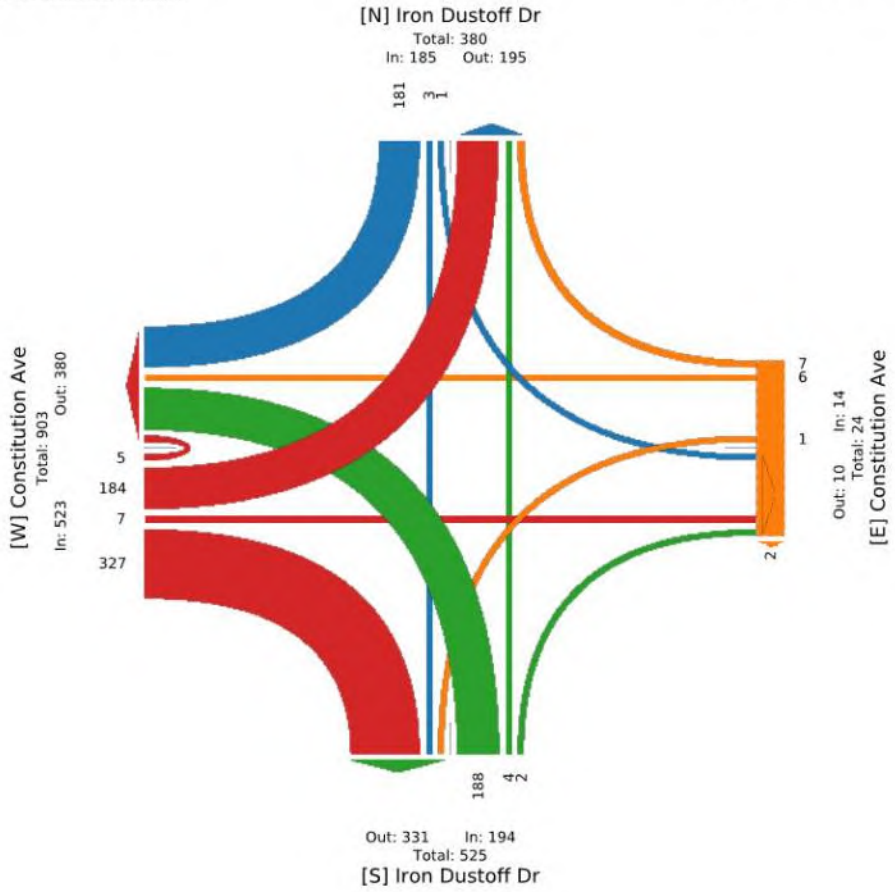
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Iron Dustoff Dr						Iron Dustoff Dr						Constitution Ave						Constitution Ave						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 6:00AM	1	0	0	0	**1**	0	0	0	2	0	**2**	0	9	0	2	0	**11**	0	0	0	0	0	**0**	0	**14**
6:15AM	2	0	0	0	**2**	0	0	0	4	0	**4**	0	7	0	16	0	**23**	0	0	0	0	0	**0**	0	**29**
6:30AM	3	1	0	0	**4**	0	0	0	11	0	**11**	0	12	1	37	0	**50**	0	0	0	0	0	**0**	0	**65**
6:45AM	5	0	0	0	**5**	0	0	0	6	0	**6**	0	6	2	57	0	**65**	0	0	0	0	0	**0**	0	**76**
Hourly Total	11	1	0	0	**12**	0	0	0	23	0	**23**	0	34	3	112	0	**149**	0	0	0	0	0	**0**	0	**184**
7:00AM	5	1	0	0	**6**	0	0	1	6	0	**7**	0	9	1	22	0	**32**	0	0	0	1	0	**1**	0	**46**
7:15AM	0	0	0	0	**0**	0	0	0	10	0	**10**	0	11	2	48	0	**61**	0	1	0	1	0	**2**	1	**73**
7:30AM	3	0	0	0	**3**	0	0	1	10	0	**11**	0	9	1	36	0	**46**	0	0	1	1	0	**2**	0	**62**
7:45AM	2	0	0	0	**2**	0	0	0	3	0	**3**	0	15	0	28	0	**43**	0	0	0	1	0	**1**	0	**49**
Hourly Total	10	1	0	0	**11**	0	0	2	29	0	**31**	0	44	4	134	0	**182**	0	1	1	4	0	**6**	1	**230**
8:00AM	3	0	1	0	**4**	0	0	0	18	0	**18**	0	13	0	16	0	**29**	0	0	0	0	0	**0**	0	**51**
8:15AM	5	1	1	0	**7**	0	0	0	16	0	**16**	0	8	0	16	0	**24**	0	0	2	1	0	**3**	1	**50**
8:30AM	6	0	0	0	**6**	0	1	0	6	0	**7**	0	5	0	7	0	**12**	0	0	0	0	0	**0**	0	**25**
8:45AM	6	0	0	0	**6**	0	0	1	8	0	**9**	0	9	0	18	0	**27**	0	0	1	0	0	**1**	0	**43**
Hourly Total	20	1	2	0	**23**	0	1	1	48	0	**50**	0	35	0	57	0	**92**	0	0	3	1	0	**4**	1	**169**
4:00PM	53	0	0	0	**53**	0	0	0	8	0	**8**	0	6	0	0	0	**6**	0	0	0	1	0	**1**	0	**68**
4:15PM	11	0	0	0	**11**	0	0	0	6	0	**6**	0	2	0	1	0	**3**	0	0	0	0	0	**0**	0	**20**
4:30PM	16	0	0	0	**16**	0	0	0	4	0	**4**	0	6	0	10	1	**17**	0	0	0	0	0	**0**	0	**37**
4:45PM	12	0	0	0	**12**	0	0	0	6	0	**6**	0	12	0	5	1	**18**	0	0	1	1	0	**2**	0	**38**
Hourly Total	92	0	0	0	**92**	0	0	0	24	0	**24**	0	26	0	16	2	**44**	0	0	1	2	0	**3**	0	**163**
5:00PM	14	1	0	0	**15**	0	0	0	15	0	**15**	0	7	0	0	1	**8**	0	0	1	0	0	**1**	0	**39**
5:15PM	13	0	0	0	**13**	0	0	0	10	0	**10**	0	12	0	1	0	**13**	0	0	0	0	0	**0**	0	**36**
5:30PM	13	0	0	0	**13**	0	0	0	4	0	**4**	0	6	0	2	0	**8**	0	0	0	0	0	**0**	0	**25**
5:45PM	0	0	0	0	**0**	0	0	0	6	0	**6**	0	5	0	1	0	**6**	0	0	0	0	0	**0**	0	**12**
Hourly Total	40	1	0	0	**41**	0	0	0	35	0	**35**	0	30	0	4	1	**35**	0	0	1	0	0	**1**	0	**112**
6:00PM	10	0	0	0	**10**	0	0	0	10	0	**10**	0	4	0	3	2	**9**	0	0	0	0	0	**0**	0	**29**
6:15PM	4	0	0	0	**4**	0	0	0	5	0	**5**	0	5	0	1	0	**6**	0	0	0	0	0	**0**	0	**15**
6:30PM	0	0	0	0	**0**	0	0	0	3	0	**3**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**3**
6:45PM	1	0	0	0	**1**	0	0	0	4	0	**4**	0	6	0	0	0	**6**	0	0	0	0	0	**0**	0	**11**
Hourly Total	15	0	0	0	**15**	0	0	0	22	0	**22**	0	15	0	4	2	**21**	0	0	0	0	0	**0**	0	**58**
Total	188	4	2	0	**194**	0	1	3	181	0	**185**	0	184	7	327	5	**523**	0	1	6	7	0	**14**	2	**916**
% Approach	96.9%	2.1%	1.0%	0%	-	-	0.5%	1.6%	97.8%	0%	-	-	35.2%	1.3%	62.5%	1.0%	-	-	7.1%	42.9%	50.0%	0%	-	-	-
% Total	20.5%	0.4%	0.2%	0%	**21.2%**	-	0.1%	0.3%	19.8%	0%	**20.2%**	-	20.1%	0.8%	35.7%	0.5%	**57.1%**	-	0.1%	0.7%	0.8%	0%	**1.5%**	-	-
Lights	184	4	1	0	**189**	-	1	3	179	0	**183**	-	181	7	322	5	**515**	-	1	4	7	0	**12**	-	899
% Lights	97.9%	100%	50.0%	0%	**97.4%**	-	100%	100%	98.9%	0%	**98.9%**	-	98.4%	100%	98.5%	100%	**98.5%**	-	100%	66.7%	100%	0%	**85.7%**	-	98.1%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Buses and Single-Unit Trucks	4	0	1	0	**5**	-	0	0	2	0	**2**	-	3	0	5	0	**8**	-	0	2	0	0	**2**	-	17
% Buses and Single-Unit Trucks	2.1%	0%	50.0%	0%	**2.6%**	-	0%	0%	1.1%	0%	**1.1%**	-	1.6%	0%	1.5%	0%	**1.5%**	-	0%	33.3%	0%	0%	**14.3%**	-	1.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Constitution Ave at Iron Dustoff Dr - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827865, Location: 31.838933, -106.3304

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Constitution Ave at Iron Dustoff Dr - TMC
Wed Apr 21, 2021
AM Peak (6:30 AM - 7:30 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827865, Location: 31.838933, -106.3304

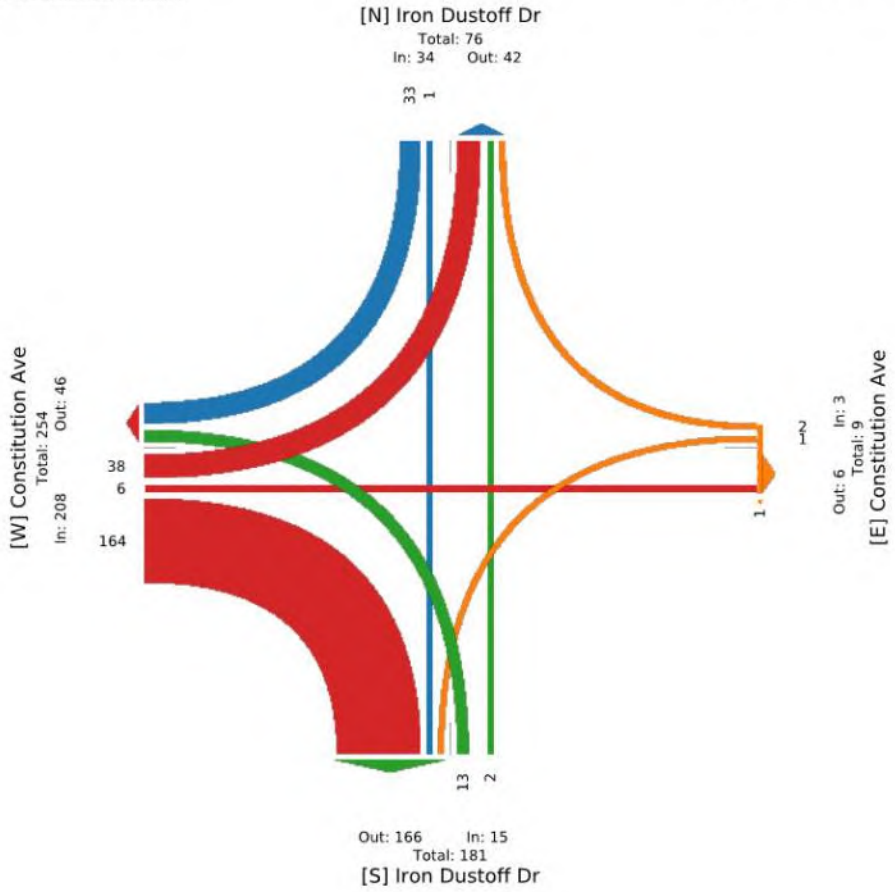
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Iron Dustoff Dr						Iron Dustoff Dr						Constitution Ave						Constitution Ave						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int.
2021-04-21 6:30AM	3	1	0	0	**4**	0	0	0	11	0	**11**	0	12	1	37	0	**50**	0	0	0	0	0	**0**	0	65
6:45AM	5	0	0	0	**5**	0	0	0	6	0	**6**	0	6	2	57	0	**65**	0	0	0	0	0	**0**	0	76
7:00AM	5	1	0	0	**6**	0	0	1	6	0	**7**	0	9	1	22	0	**32**	0	0	0	1	0	**1**	0	46
7:15AM	0	0	0	0	**0**	0	0	0	10	0	**10**	0	11	2	48	0	**61**	0	1	0	1	0	**2**	1	73
Total	13	2	0	0	**15**	0	0	1	33	0	**34**	0	38	6	164	0	**208**	0	1	0	2	0	**3**	1	260
% Approach	86.7%	13.3%	0%	0%	-	-	0%	2.9%	97.1%	0%	-	-	18.3%	2.9%	78.8%	0%	-	-	33.3%	0%	66.7%	0%	-	-	-
% Total	5.0%	0.8%	0%	0%	**5.8%**	-	0%	0.4%	12.7%	0%	**13.1%**	-	14.6%	2.3%	63.1%	0%	**80.0%**	-	0.4%	0%	0.8%	0%	**1.2%**	-	-
PHF	0.650	0.500	-	-	**0.625**	-	-	0.250	0.750	-	**0.773**	-	0.792	0.750	0.719	-	**0.800**	-	0.250	-	0.500	-	**0.375**	-	0.855
Lights	12	2	0	0	**14**	-	0	1	33	0	**34**	-	36	6	163	0	**205**	-	1	0	2	0	**3**	-	256
% Lights	92.3%	100%	0%	0%	**93.3%**	-	0%	100%	100%	0%	**100%**	-	94.7%	100%	99.4%	0%	**98.6%**	-	100%	0%	100%	0%	**100%**	-	98.5%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Buses and Single-Unit Trucks	1	0	0	0	**1**	-	0	0	0	0	**0**	-	2	0	1	0	**3**	-	0	0	0	0	**0**	-	4
% Buses and Single-Unit Trucks	7.7%	0%	0%	0%	**6.7%**	-	0%	0%	0%	0%	**0%**	-	5.3%	0%	0.6%	0%	**1.4%**	-	0%	0%	0%	0%	**0%**	-	1.5%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Constitution Ave at Iron Dustoff Dr - TMC
Wed Apr 21, 2021
AM Peak (6:30 AM - 7:30 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827865, Location: 31.838933, -106.3304

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Constitution Ave at Iron Dustoff Dr - TMC
Wed Apr 21, 2021
PM Peak (4 PM - 5 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827865, Location: 31.838933, -106.3304

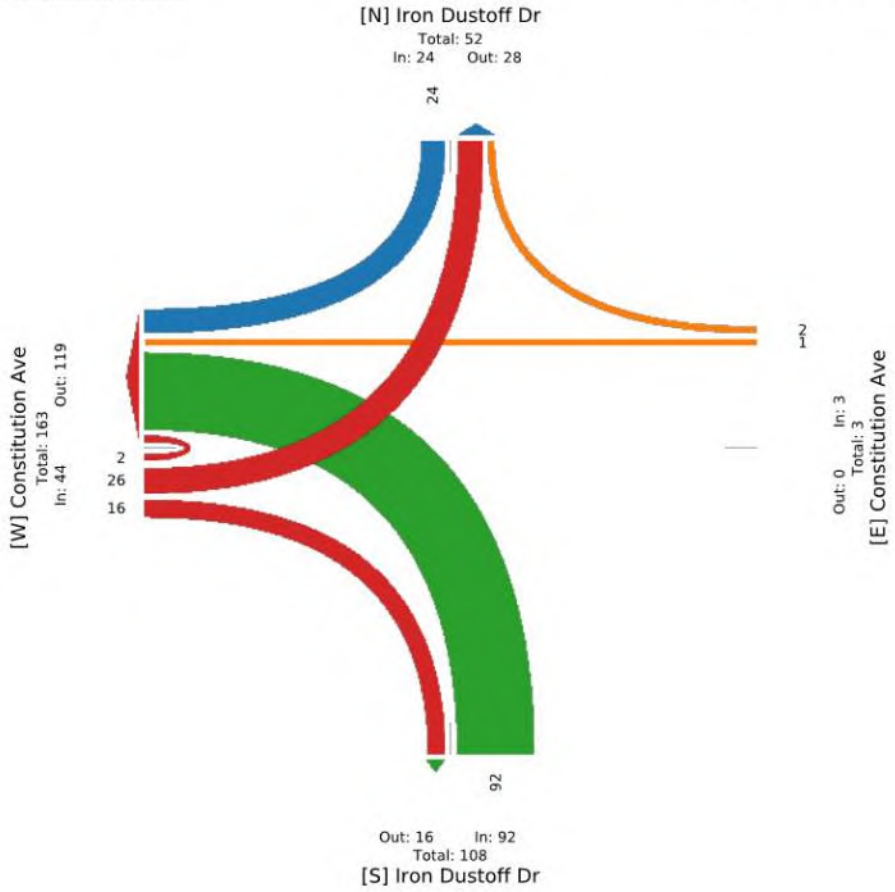
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Iron Dustoff Dr						Iron Dustoff Dr						Constitution Ave						Constitution Ave						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 4:00PM	53	0	0	0	**53**	0	0	0	8	0	**8**	0	6	0	0	0	**6**	0	0	0	1	0	**1**	0	**68**
4:15PM	11	0	0	0	**11**	0	0	0	6	0	**6**	0	2	0	1	0	**3**	0	0	0	0	0	**0**	0	**20**
4:30PM	16	0	0	0	**16**	0	0	0	4	0	**4**	0	6	0	10	1	**17**	0	0	0	0	0	**0**	0	**37**
4:45PM	12	0	0	0	**12**	0	0	0	6	0	**6**	0	12	0	5	1	**18**	0	0	1	1	0	**2**	0	**38**
Total	92	0	0	0	**92**	0	0	0	24	0	**24**	0	26	0	16	2	**44**	0	0	1	2	0	**3**	0	**163**
% Approach	100%	0%	0%	0%	-	-	0%	0%	100%	0%	-	-	59.1%	0%	36.4%	4.5%	-	-	0%	33.3%	66.7%	0%	-	-	-
% Total	56.4%	0%	0%	0%	**56.4%**	-	0%	0%	14.7%	0%	**14.7%**	-	16.0%	0%	9.8%	1.2%	**27.0%**	-	0%	0.6%	1.2%	0%	**1.8%**	-	-
PHF	0.434	-	-	-	**0.434**	-	-	-	0.750	-	**0.750**	-	0.542	-	0.400	0.500	**0.611**	-	-	0.250	0.500	-	**0.375**	-	0.599
Lights	92	0	0	0	**92**	-	0	0	23	0	**23**	-	25	0	16	2	**43**	-	0	1	2	0	**3**	-	161
% Lights	100%	0%	0%	0%	**100%**	-	0%	0%	95.8%	0%	**95.8%**	-	96.2%	0%	100%	100%	**97.7%**	-	0%	100%	100%	0%	**100%**	-	98.8%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Buses and Single-Unit Trucks	0	0	0	0	**0**	-	0	0	1	0	**1**	-	1	0	0	0	**1**	-	0	0	0	0	**0**	-	2
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	4.2%	0%	**4.2%**	-	3.8%	0%	0%	0%	**2.3%**	-	0%	0%	0%	0%	**0%**	-	1.2%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk, L: Left, R: Right, T: Thru, U: U-Turn

Constitution Ave at Iron Dustoff Dr - TMC
Wed Apr 21, 2021
PM Peak (4 PM - 5 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827865, Location: 31.838933, -106.3304

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Iron Dustoff Dr at Iron Medics Dr - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827866, Location: 31.82751, -106.330107

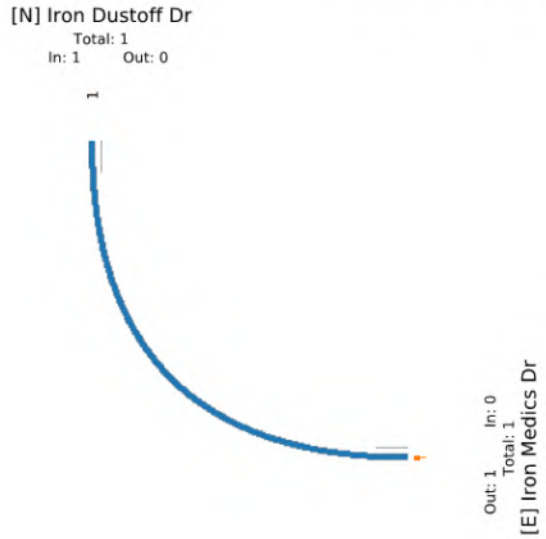
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Iron Dustoff Dr				Iron Medics Dr				
Direction	Southbound				Westbound				
Time	L	U	App	Ped*	R	U	App	Ped*	Int
2021-04-21 6:00AM	0	0	**0**	0	0	0	**0**	0	**0**
6:15AM	0	0	**0**	0	0	0	**0**	0	**0**
6:30AM	0	0	**0**	0	0	0	**0**	0	**0**
6:45AM	0	0	**0**	0	0	0	**0**	0	**0**
Hourly Total	0	0	**0**	0	0	0	**0**	0	**0**
7:00AM	0	0	**0**	0	0	0	**0**	0	**0**
7:15AM	0	0	**0**	0	0	0	**0**	0	**0**
7:30AM	0	0	**0**	0	0	0	**0**	0	**0**
7:45AM	0	0	**0**	0	0	0	**0**	0	**0**
Hourly Total	0	0	**0**	0	0	0	**0**	0	**0**
8:00AM	0	0	**0**	0	0	0	**0**	0	**0**
8:15AM	0	0	**0**	0	0	0	**0**	0	**0**
8:30AM	1	0	**1**	0	0	0	**0**	0	**1**
8:45AM	0	0	**0**	0	0	0	**0**	0	**0**
Hourly Total	1	0	**1**	0	0	0	**0**	0	**1**
4:00PM	0	0	**0**	0	0	0	**0**	0	**0**
4:15PM	0	0	**0**	0	0	0	**0**	0	**0**
4:30PM	0	0	**0**	0	0	0	**0**	0	**0**
4:45PM	0	0	**0**	0	0	0	**0**	0	**0**
Hourly Total	0	0	**0**	0	0	0	**0**	0	**0**
5:00PM	0	0	**0**	0	0	0	**0**	0	**0**
5:15PM	0	0	**0**	0	0	0	**0**	0	**0**
5:30PM	0	0	**0**	0	0	0	**0**	0	**0**
5:45PM	0	0	**0**	0	0	0	**0**	0	**0**
Hourly Total	0	0	**0**	0	0	0	**0**	0	**0**
6:00PM	0	0	**0**	0	0	0	**0**	0	**0**
6:15PM	0	0	**0**	0	0	0	**0**	0	**0**
6:30PM	0	0	**0**	0	0	0	**0**	0	**0**
6:45PM	0	0	**0**	0	0	0	**0**	0	**0**
Hourly Total	0	0	**0**	0	0	0	**0**	0	**0**
Total	1	0	**1**	0	0	0	**0**	0	**1**
% Approach	100%	0%	-	-	0%	0%	-	-	-
% Total	100%	0%	**100%**	-	0%	0%	**0%**	-	-
Lights	1	0	**1**	-	0	0	**0**	-	1
% Lights	100%	0%	**100%**	-	0%	0%	-	-	100%
Articulated Trucks	0	0	**0**	-	0	0	**0**	-	0
% Articulated Trucks	0%	0%	**0%**	-	0%	0%	-	-	0%
Buses and Single-Unit Trucks	0	0	**0**	-	0	0	**0**	-	0
% Buses and Single-Unit Trucks	0%	0%	**0%**	-	0%	0%	-	-	0%
Pedestrians	-	-	-	0	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, U: U-Turn

Iron Dustoff Dr at Iron Medics Dr - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827866, Location: 31.82751, -106.330107

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Iron Dustoff Dr at Iron Medics Dr - TMC
Wed Apr 21, 2021
AM Peak (8:30 AM - 9:30 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827866, Location: 31.82751, -106.330107

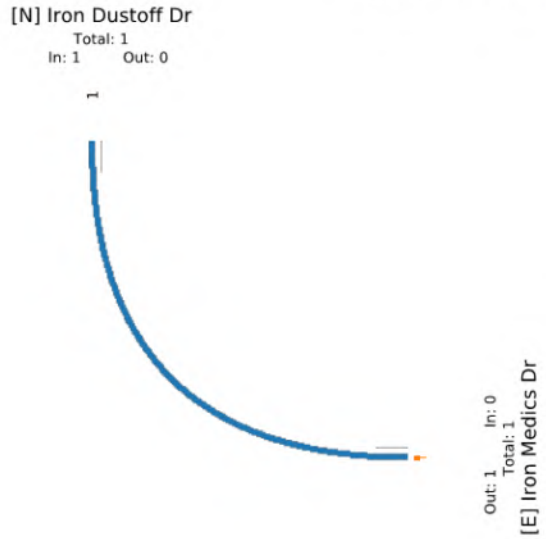
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Iron Dustoff Dr				Iron Medics Dr				
Direction	Southbound				Westbound				
Time	L	U	App	Ped*	R	U	App	Ped*	Int
2021-04-21 8:30AM	1	0	**1**	0	0	0	**0**	0	**1**
8:45AM	0	0	**0**	0	0	0	**0**	0	**0**
Total	1	0	**1**	0	0	0	**0**	0	**1**
% Approach	100%	0%	-	-	0%	0%	-	-	-
% Total	100%	0%	**100%**	-	0%	0%	**0%**	-	-
PHF	0.250	-	**0.250**	-	-	-	-	-	0.250
Lights	1	0	**1**	-	0	0	**0**	-	1
% Lights	100%	0%	**100%**	-	0%	0%	-	-	100%
Articulated Trucks	0	0	**0**	-	0	0	**0**	-	0
% Articulated Trucks	0%	0%	**0%**	-	0%	0%	-	-	0%
Buses and Single-Unit Trucks	0	0	**0**	-	0	0	**0**	-	0
% Buses and Single-Unit Trucks	0%	0%	**0%**	-	0%	0%	-	-	0%
Pedestrians	-	-	-	0	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, U: U-Turn

Iron Dustoff Dr at Iron Medics Dr - TMC
Wed Apr 21, 2021
AM Peak (8:30 AM - 9:30 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827866, Location: 31.82751, -106.330107

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



SB Spur 601 at Loop 375 - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827872, Location: 31.84109, -106.325534

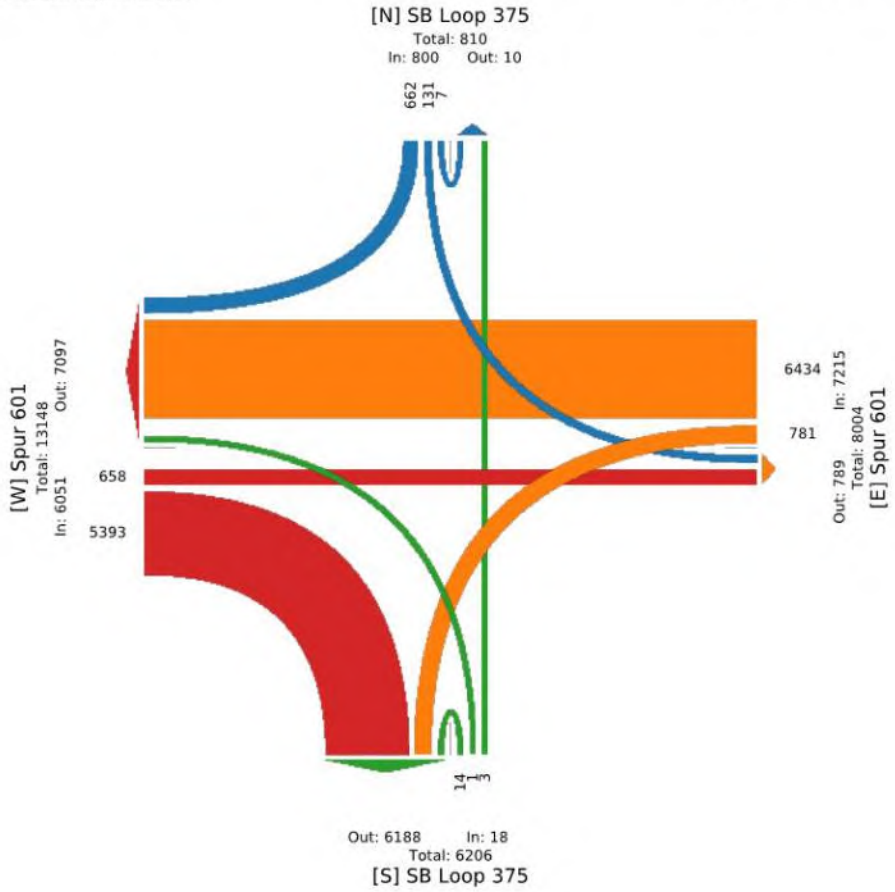
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	SB Loop 375 Northbound						SB Loop 375 Southbound						Spur 601 Eastbound						Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 6:00AM	0	0	0	2	**2**	0	82	0	34	0	**116**	0	0	110	67	0	**177**	0	5	329	0	0	**334**	0	**629**
6:15AM	0	0	0	0	**0**	0	8	0	18	0	**26**	0	0	23	54	0	**77**	0	5	239	0	0	**244**	0	**347**
6:30AM	0	0	0	0	**0**	0	3	0	34	1	**38**	0	0	10	119	0	**129**	0	24	356	0	0	**380**	0	**547**
6:45AM	0	0	0	1	**1**	0	0	0	38	0	**38**	0	0	23	126	0	**149**	0	32	444	0	0	**476**	0	**664**
Hourly Total	0	0	0	3	**3**	0	93	0	124	1	**218**	0	0	166	366	0	**532**	0	66	1368	0	0	**1434**	0	**2187**
7:00AM	0	0	0	0	**0**	0	0	0	25	0	**25**	0	0	15	131	0	**146**	0	8	419	0	0	**427**	0	**598**
7:15AM	0	0	0	0	**0**	0	0	0	32	0	**32**	0	0	18	152	0	**170**	0	27	476	0	0	**503**	0	**705**
7:30AM	0	0	0	2	**2**	0	2	0	33	0	**35**	0	0	35	169	0	**204**	0	57	538	0	0	**595**	0	**836**
7:45AM	0	0	0	0	**0**	0	0	0	24	0	**24**	0	0	18	168	0	**186**	0	51	434	0	0	**485**	0	**695**
Hourly Total	0	0	0	2	**2**	0	2	0	114	0	**116**	0	0	86	620	0	**706**	0	143	1867	0	0	**2010**	0	**2834**
8:00AM	0	0	0	0	**0**	0	7	0	19	0	**26**	0	0	13	107	0	**120**	0	76	396	0	0	**472**	0	**618**
8:15AM	0	1	0	0	**1**	0	4	0	15	0	**19**	0	0	22	107	0	**129**	0	41	333	0	0	**374**	0	**523**
8:30AM	0	2	0	0	**2**	0	12	0	16	0	**28**	0	0	49	86	0	**135**	0	6	373	0	0	**379**	0	**544**
8:45AM	0	0	0	0	**0**	0	13	0	19	1	**33**	0	0	48	104	0	**152**	0	6	317	0	0	**323**	0	**508**
Hourly Total	0	3	0	0	**3**	0	36	0	69	1	**106**	0	0	132	404	0	**536**	0	129	1419	0	0	**1548**	0	**2193**
4:00PM	1	0	0	1	**2**	0	0	0	39	1	**40**	0	0	21	378	0	**399**	0	26	149	0	0	**175**	0	**616**
4:15PM	0	0	0	1	**1**	0	0	0	30	0	**30**	0	0	28	425	0	**453**	0	38	162	0	0	**200**	0	**684**
4:30PM	0	0	0	0	**0**	0	0	0	39	0	**39**	0	0	19	500	0	**519**	0	53	177	0	0	**228**	0	**786**
4:45PM	0	0	0	1	**1**	0	0	0	21	0	**21**	0	0	17	440	0	**457**	0	46	171	0	0	**217**	0	**696**
Hourly Total	1	0	0	3	**4**	0	0	0	129	1	**130**	0	0	85	1743	0	**1828**	0	163	659	0	0	**820**	0	**2782**
5:00PM	0	0	0	0	**0**	0	0	0	27	1	**28**	0	0	26	401	0	**427**	0	83	161	0	0	**244**	0	**699**
5:15PM	0	0	0	0	**0**	0	0	0	36	0	**36**	0	0	34	405	0	**439**	0	82	227	0	0	**309**	0	**784**
5:30PM	0	0	0	0	**0**	0	0	0	34	1	**35**	0	0	21	362	0	**383**	0	69	157	0	0	**226**	0	**644**
5:45PM	0	0	0	1	**1**	0	0	0	26	1	**27**	0	0	22	254	0	**276**	0	37	142	0	0	**179**	0	**483**
Hourly Total	0	0	0	1	**1**	0	0	0	123	3	**126**	0	0	103	1422	0	**1525**	0	271	687	0	0	**958**	0	**2610**
6:00PM	0	0	0	2	**2**	0	0	0	26	0	**26**	0	0	25	261	0	**286**	0	11	112	0	0	**123**	0	**437**
6:15PM	0	0	0	1	**1**	0	0	0	23	0	**23**	0	0	26	229	0	**255**	0	0	145	0	0	**145**	0	**424**
6:30PM	0	0	0	1	**1**	0	0	0	29	0	**29**	0	0	19	191	0	**210**	0	0	91	0	0	**91**	0	**331**
6:45PM	0	0	0	1	**1**	0	0	0	25	1	**26**	0	0	16	157	0	**173**	0	0	86	0	0	**86**	0	**286**
Hourly Total	0	0	0	5	**5**	0	0	0	103	1	**104**	0	0	86	838	0	**924**	0	11	434	0	0	**445**	0	**1478**
Total	1	3	0	14	**18**	0	131	0	662	7	**800**	0	0	658	5393	0	**6051**	0	781	6434	0	0	**7215**	0	**14084**
% Approach	5.6%	16.7%	0%	77.8%	-	-	16.4%	0%	82.8%	0.9%	-	-	0%	10.9%	89.1%	0%	-	-	10.8%	89.2%	0%	0%	-	-	-
% Total	0%	0%	0%	0.1%	**0.1%**	-	0.9%	0%	4.7%	0%	**5.7%**	-	0%	4.7%	38.3%	0%	**43.0%**	-	5.5%	45.7%	0%	0%	**51.2%**	-	-
Lights	1	3	0	14	**18**	-	131	0	653	7	**791**	-	0	648	5189	0	**5837**	-	781	6243	0	0	**7024**	-	13670
% Lights	100%	100%	0%	100%	**100%**	-	100%	0%	98.6%	100%	**98.9%**	-	0%	98.5%	96.2%	0%	**96.5%**	-	100%	97.0%	0%	0%	**97.4%**	-	97.1%
Articulated Trucks	0	0	0	0	**0**	-	0	0	4	0	**4**	-	0	4	137	0	**141**	-	0	120	0	0	**120**	-	265
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0.6%	0%	**0.5%**	-	0%	0.6%	2.5%	0%	**2.3%**	-	0%	1.9%	0%	0%	**1.7%**	-	1.9%
Buses and Single-Unit Trucks	0	0	0	0	**0**	-	0	0	5	0	**5**	-	0	6	67	0	**73**	-	0	71	0	0	**71**	-	149
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0.8%	0%	**0.6%**	-	0%	0.9%	1.2%	0%	**1.2%**	-	0%	1.1%	0%	0%	**1.0%**	-	1.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

SB Spur 601 at Loop 375 - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827872, Location: 31.84109, -106.325534

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



SB Spur 601 at Loop 375 - TMC
Wed Apr 21, 2021
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827872, Location: 31.84109, -106.325534

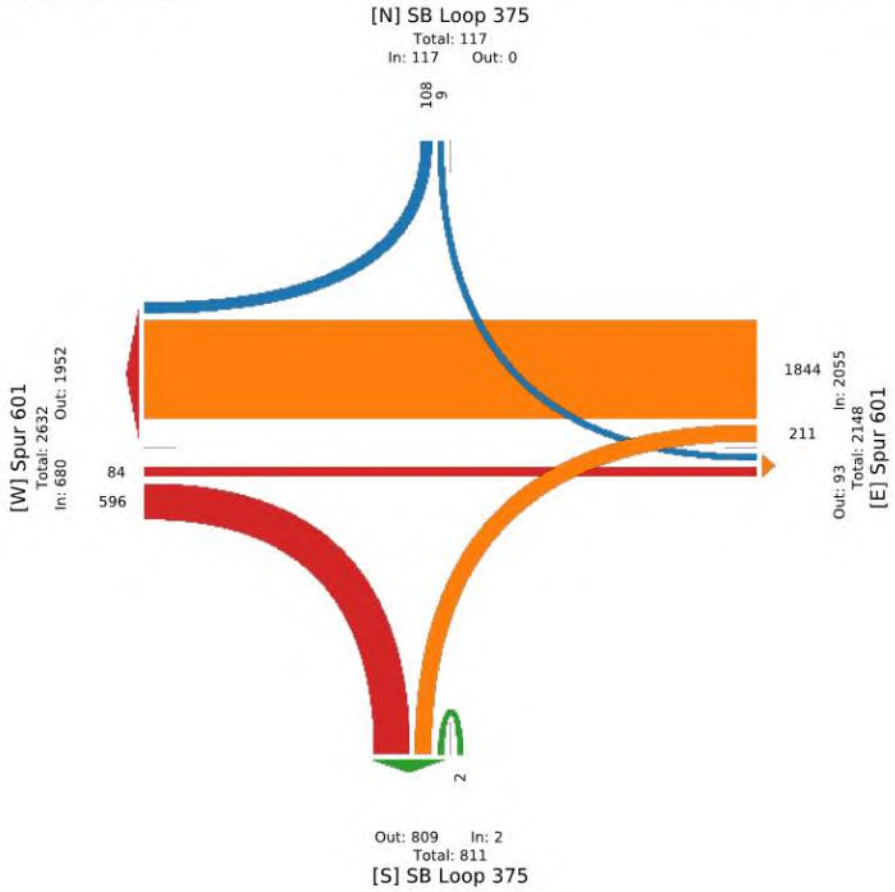
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	SB Loop 375 Northbound						SB Loop 375 Southbound						Spur 601 Eastbound						Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 7:15AM	0	0	0	0	**0**	0	0	0	32	0	**32**	0	0	18	152	0	**170**	0	27	476	0	0	**503**	0	**705**
7:30AM	0	0	0	2	**2**	0	2	0	33	0	**35**	0	0	35	169	0	**204**	0	57	538	0	0	**595**	0	**836**
7:45AM	0	0	0	0	**0**	0	0	0	24	0	**24**	0	0	18	168	0	**186**	0	51	434	0	0	**485**	0	**695**
8:00AM	0	0	0	0	**0**	0	7	0	19	0	**26**	0	0	13	107	0	**120**	0	76	396	0	0	**472**	0	**618**
Total	0	0	0	2	**2**	0	9	0	108	0	**117**	0	0	84	596	0	**680**	0	211	1844	0	0	**2055**	0	**2854**
% Approach	0%	0%	0%	100%	-	-	7.7%	0%	92.3%	0%	-	-	0%	12.4%	87.6%	0%	-	-	10.3%	89.7%	0%	0%	-	-	-
% Total	0%	0%	0%	0.1%	**0.1%**	-	0.3%	0%	3.8%	0%	**4.1%**	-	0%	2.9%	20.9%	0%	**23.8%**	-	7.4%	64.6%	0%	0%	**72.0%**	-	-
PHF	-	-	-	0.250	**0.250**	-	0.321	-	0.818	-	**0.836**	-	-	0.600	0.882	-	**0.833**	-	0.694	0.857	-	-	**0.863**	-	0.853
Lights	0	0	0	2	**2**	-	9	0	104	0	**113**	-	0	82	573	0	**655**	-	211	1808	0	0	**2019**	-	2789
% Lights	0%	0%	0%	100%	**100%**	-	100%	0%	96.3%	0%	**96.6%**	-	0%	97.6%	96.1%	0%	**96.3%**	-	100%	98.0%	0%	0%	**98.2%**	-	97.7%
Articulated Trucks	0	0	0	0	**0**	-	0	0	1	0	**1**	-	0	2	12	0	**14**	-	0	27	0	0	**27**	-	42
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0.9%	0%	**0.9%**	-	0%	2.4%	2.0%	0%	**2.1%**	-	0%	1.5%	0%	0%	**1.3%**	-	1.5%
Buses and Single-Unit Trucks	0	0	0	0	**0**	-	0	0	3	0	**3**	-	0	0	11	0	**11**	-	0	9	0	0	**9**	-	23
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	2.8%	0%	**2.6%**	-	0%	0%	1.8%	0%	**1.6%**	-	0%	0.5%	0%	0%	**0.4%**	-	0.8%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk, L: Left, R: Right, T: Thru, U: U-Turn

SB Spur 601 at Loop 375 - TMC
Wed Apr 21, 2021
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827872, Location: 31.84109, -106.325534

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



SB Spur 601 at Loop 375 - TMC
Wed Apr 21, 2021
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827872, Location: 31.84109, -106.325534

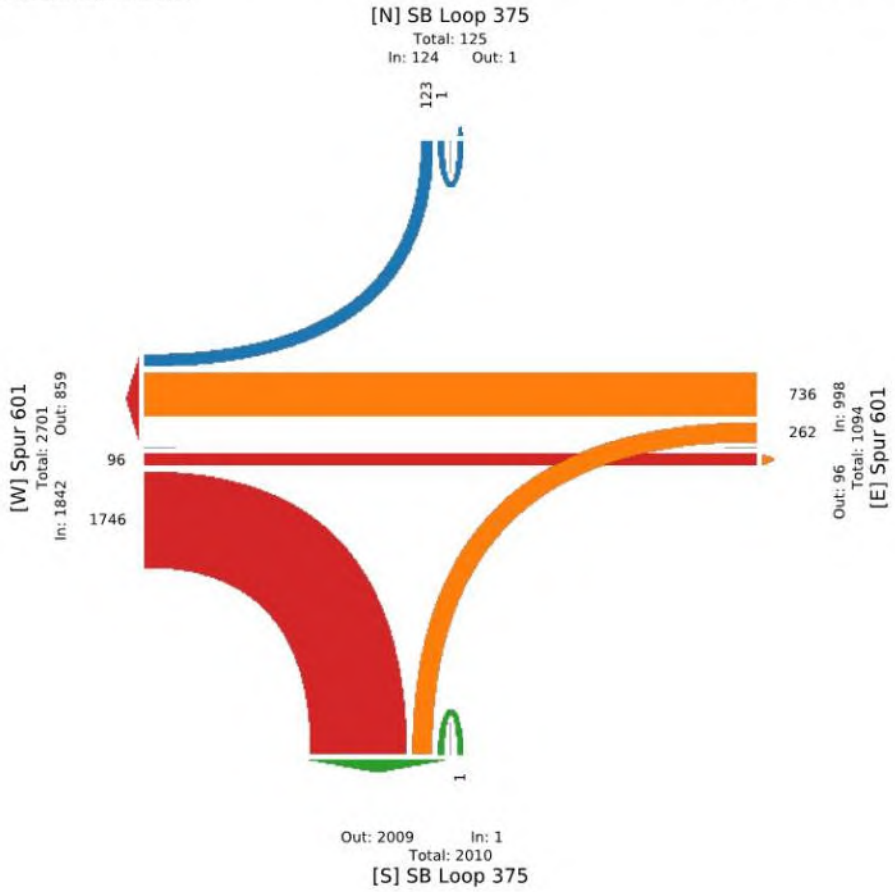
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	SB Loop 375						SB Loop 375						Spur 601						Spur 601						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App.	Ped*	L	T	R	U	App.	Ped*	L	T	R	U	App.	Ped*	L	T	R	U	App.	Ped*	Int.
2021-04-21 4:30PM	0	0	0	0	**0**	0	0	0	39	0	**39**	0	0	19	500	0	**519**	0	51	177	0	0	**228**	0	**786**
4:45PM	0	0	0	1	**1**	0	0	0	21	0	**21**	0	0	17	440	0	**457**	0	46	171	0	0	**217**	0	**696**
5:00PM	0	0	0	0	**0**	0	0	0	27	1	**28**	0	0	26	401	0	**427**	0	83	161	0	0	**244**	0	**699**
5:15PM	0	0	0	0	**0**	0	0	0	36	0	**36**	0	0	34	405	0	**439**	0	82	227	0	0	**309**	0	**784**
Total	0	0	0	1	**1**	0	0	0	123	1	**124**	0	0	96	1746	0	**1842**	0	262	736	0	0	**998**	0	**2965**
% Approach	0%	0%	0%	100%	-	-	0%	0%	99.2%	0.8%	-	-	0%	5.2%	94.8%	0%	-	-	26.3%	73.7%	0%	0%	-	-	-
% Total	0%	0%	0%	0%	**0%**	-	0%	0%	4.1%	0%	**4.2%**	-	0%	3.2%	58.9%	0%	**62.1%**	-	8.8%	24.8%	0%	0%	**33.7%**	-	-
PHF	-	-	-	0.250	**0.250**		-	-	0.788	0.250	**0.795**	-	-	0.706	0.873	-	**0.887**	-	0.789	0.811	-	-	**0.807**	-	0.943
Lights	0	0	0	1	**1**	-	0	0	121	1	**122**	-	0	96	1692	0	**1788**	-	262	700	0	0	**962**	-	2873
% Lights	0%	0%	0%	100%	**100%**	-	0%	0%	98.4%	100%	**98.4%**	-	0%	100%	96.9%	0%	**97.1%**	-	100%	95.1%	0%	0%	**96.4%**	-	96.9%
Articulated Trucks	0	0	0	0	**0**	-	0	0	2	0	**2**	-	0	0	41	0	**41**	-	0	23	0	0	**23**	-	66
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	1.6%	0%	**1.6%**	-	0%	0%	2.3%	0%	**2.2%**	-	0%	3.1%	0%	0%	**2.3%**	-	2.2%
Buses and Single-Unit Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	13	0	**13**	-	0	13	0	0	**13**	-	26
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0.7%	0%	**0.7%**	-	0%	1.8%	0%	0%	**1.3%**	-	0.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk, L: Left, R: Right, T: Thru, U: U-Turn

SB Spur 601 at Loop 375 - TMC
Wed Apr 21, 2021
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827872, Location: 31.84109, -106.325534

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Spur 601 at NB Loop 375 - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827870, Location: 31.841256, -106.324246

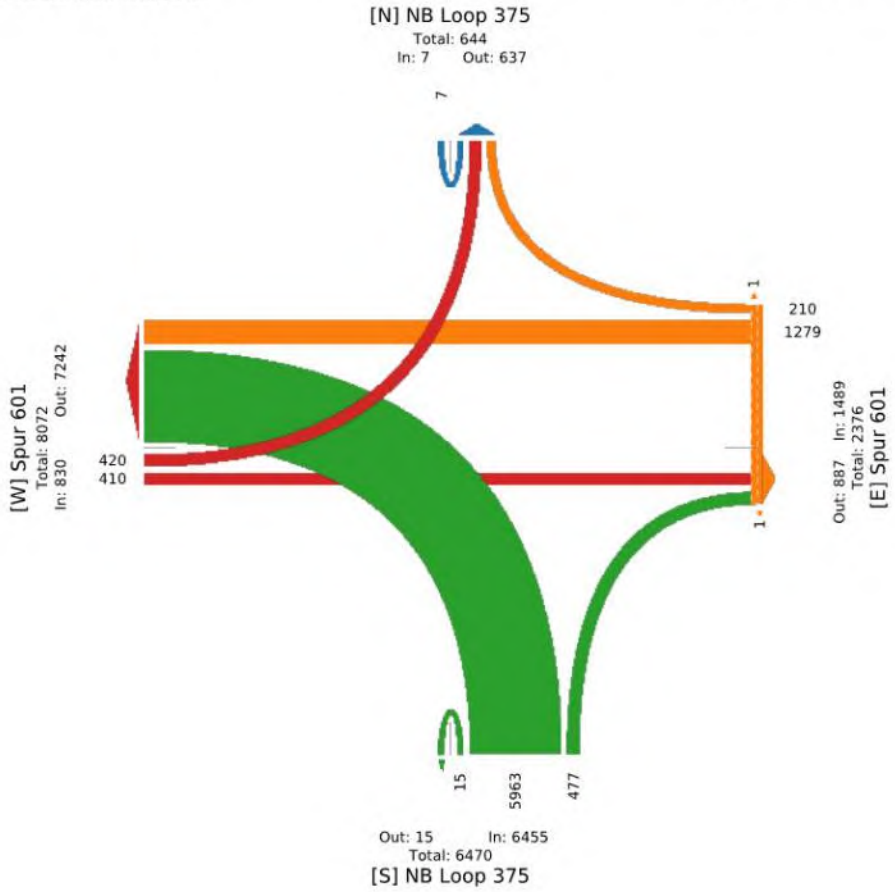
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	NB Loop 375 Northbound						NB Loop 375 Southbound						Spur 601 Eastbound						Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int.
2021-04-21 6:00AM	351	0	206	2	559	0	0	0	0	0	0	0	5	217	0	0	222	0	0	9	0	0	9	0	790
6:15AM	215	0	28	0	243	0	0	0	0	0	0	0	9	33	0	0	42	0	0	10	2	0	12	0	297
6:30AM	339	0	8	0	347	0	0	0	0	1	1	0	4	6	0	0	10	0	0	49	10	0	59	0	417
6:45AM	387	0	8	1	396	0	0	0	0	0	0	0	22	4	0	0	26	0	0	46	4	0	50	0	472
Hourly Total	1292	0	250	3	1545	0	0	0	0	1	1	0	40	260	0	0	300	0	0	114	16	0	130	0	1976
7:00AM	448	0	4	0	452	0	0	0	0	0	0	0	11	4	0	0	15	0	0	17	1	0	18	0	485
7:15AM	454	0	9	0	463	0	0	0	0	0	0	0	15	1	0	0	16	0	0	35	3	0	38	0	517
7:30AM	487	0	8	2	497	0	0	0	0	0	0	0	28	9	0	0	37	0	0	79	11	0	90	0	624
7:45AM	473	0	14	0	487	0	0	0	0	0	0	0	14	3	0	0	17	0	0	80	8	0	88	0	592
Hourly Total	1862	0	35	2	1899	0	0	0	0	0	0	0	68	17	0	0	85	0	0	211	23	0	234	0	2218
8:00AM	324	0	17	0	341	0	0	0	0	0	0	0	9	12	0	0	21	0	0	133	56	0	189	0	551
8:15AM	302	0	18	0	320	0	0	0	0	0	0	0	9	14	0	0	23	0	0	62	6	0	68	0	411
8:30AM	385	0	67	0	452	0	0	0	0	0	0	0	14	44	0	0	58	0	0	10	2	0	12	0	522
8:45AM	297	0	85	0	382	0	0	0	0	1	1	0	10	56	0	0	66	0	0	9	1	0	10	0	459
Hourly Total	1308	0	187	0	1495	0	0	0	0	1	1	0	42	126	0	0	168	0	0	214	65	0	279	0	1943
4:00PM	143	0	0	1	144	0	0	0	0	1	1	0	24	1	0	0	25	0	0	48	6	0	54	0	224
4:15PM	129	0	1	2	132	0	0	0	0	0	0	0	28	0	0	0	28	0	0	61	8	0	69	0	229
4:30PM	133	0	0	0	133	0	0	0	0	0	0	0	18	0	0	0	18	0	0	91	14	0	105	0	256
4:45PM	148	0	1	1	150	0	0	0	0	0	0	0	18	0	0	0	18	0	0	81	18	0	99	0	267
Hourly Total	553	0	2	4	559	0	0	0	0	1	1	0	88	1	0	0	89	0	0	281	46	0	327	0	976
5:00PM	105	0	0	0	105	0	0	0	0	1	1	0	25	0	0	0	25	0	0	135	13	0	148	0	279
5:15PM	153	0	0	0	153	0	0	0	0	0	0	0	36	1	0	0	37	0	0	138	19	0	157	1	347
5:30PM	125	0	2	0	127	0	0	0	0	1	1	0	19	0	0	0	19	0	0	102	14	0	116	0	263
5:45PM	125	0	0	1	126	0	0	0	0	1	1	0	22	0	0	0	22	0	0	64	10	0	74	1	223
Hourly Total	508	0	2	1	511	0	0	0	0	3	3	0	102	1	0	0	103	0	0	439	56	0	495	2	1112
6:00PM	107	0	1	2	110	0	0	0	0	0	0	0	20	2	0	0	22	0	0	19	2	0	21	0	153
6:15PM	136	0	0	1	137	0	0	0	0	0	0	0	28	3	0	0	31	0	0	1	2	0	3	0	171
6:30PM	97	0	0	1	98	0	0	0	0	0	0	0	19	0	0	0	19	0	0	0	0	0	0	0	117
6:45PM	100	0	0	1	101	0	0	0	0	1	1	0	13	0	0	0	13	0	0	0	0	0	0	0	115
Hourly Total	440	0	1	5	446	0	0	0	0	1	1	0	80	5	0	0	85	0	0	20	4	0	24	0	556
Total	5963	0	477	15	6455	0	0	0	0	7	7	0	420	410	0	0	830	0	0	1279	210	0	1489	2	8781
% Approach	92.4%	0%	7.4%	0.2%	-		0%	0%	0%	100%	-		50.6%	49.4%	0%	0%	-		0%	85.9%	14.1%	0%	-		
% Total	67.9%	0%	5.4%	0.2%	**73.5%**		0%	0%	0%	0.1%	**0.1%**		4.8%	4.7%	0%	0%	**9.5%**		0%	14.6%	2.4%	0%	**17.0%**		
Lights	5771	0	477	15	**6263**		0	0	0	7	**7**		414	409	0	0	**823**		0	1279	210	0	**1489**		8582
% Lights	96.8%	0%	100%	100%	**97.0%**		0%	0%	0%	100%	**100%**		98.6%	99.8%	0%	0%	**99.2%**		0%	100%	100%	0%	**100%**		97.7%
Articulated Trucks	116	0	0	0	**116**		0	0	0	0	**0**		4	0	0	0	**4**		0	0	0	0	**0**		120
% Articulated Trucks	1.9%	0%	0%	0%	**1.8%**		0%	0%	0%	0%	**0%**		1.0%	0%	0%	0%	**0.5%**		0%	0%	0%	0%	**0%**		1.4%
Buses and Single-Unit Trucks	76	0	0	0	**76**		0	0	0	0	**0**		2	1	0	0	**3**		0	0	0	0	**0**		79
% Buses and Single-Unit Trucks	1.3%	0%	0%	0%	**1.2%**		0%	0%	0%	0%	**0%**		0.5%	0.2%	0%	0%	**0.4%**		0%	0%	0%	0%	**0%**		0.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	
% Pedestrians	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	100%	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	0%	

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Spur 601 at NB Loop 375 - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827870, Location: 31.841256, -106.324246

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Spur 601 at NB Loop 375 - TMC
Wed Apr 21, 2021
AM Peak (7:15 AM - 8:15 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827870, Location: 31.841256, -106.324246

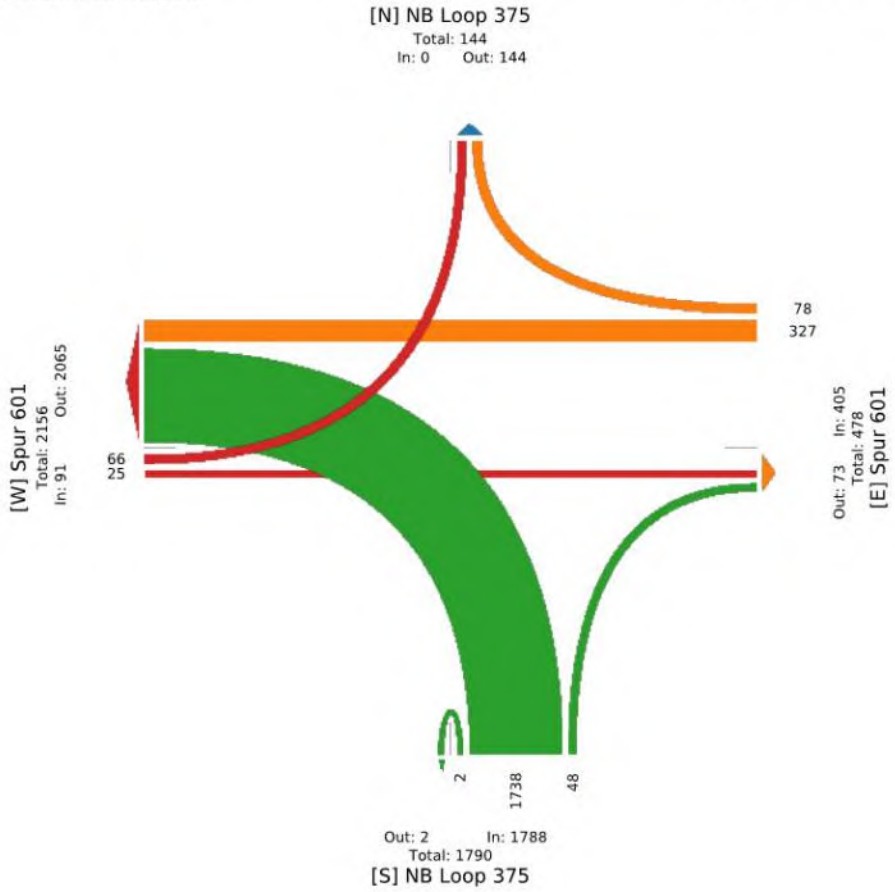
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	NB Loop 375						NB Loop 375						Spur 601						Spur 601						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 7:15AM	454	0	9	0	**463**	0	0	0	0	0	**0**	0	15	1	0	0	**16**	0	0	35	3	0	**38**	0	**517**
7:30AM	487	0	8	2	**497**	0	0	0	0	0	**0**	0	28	9	0	0	**37**	0	0	79	11	0	**90**	0	**624**
7:45AM	473	0	14	0	**487**	0	0	0	0	0	**0**	0	14	3	0	0	**17**	0	0	80	8	0	**88**	0	**592**
8:00AM	324	0	17	0	**341**	0	0	0	0	0	**0**	0	9	12	0	0	**21**	0	0	133	56	0	**189**	0	**551**
Total	1738	0	48	2	**1788**	0	0	0	0	0	**0**	0	66	25	0	0	**91**	0	0	327	78	0	**405**	0	**2284**
% Approach	97.2%	0%	2.7%	0.1%	-	-	0%	0%	0%	0%	-	-	72.5%	27.5%	0%	0%	-	-	0%	80.7%	19.3%	0%	-	-	-
% Total	76.1%	0%	2.1%	0.1%	**78.3%**	-	0%	0%	0%	0%	**0%**	-	2.9%	1.1%	0%	0%	**4.0%**	-	0%	14.3%	3.4%	0%	**17.7%**	-	-
PHF	0.892	-	0.706	0.250	**0.899**	-	-	-	-	-	-	-	0.589	0.521	-	-	**0.615**	-	-	0.615	0.348	-	**0.536**	-	0.915
Lights	1702	0	48	2	**1752**	-	0	0	0	0	**0**	-	64	25	0	0	**89**	-	0	327	78	0	**405**	-	2246
% Lights	97.9%	0%	100%	100%	**98.0%**	-	0%	0%	0%	0%	-	-	97.0%	100%	0%	0%	**97.8%**	-	0%	100%	100%	0%	**100%**	-	98.3%
Articulated Trucks	26	0	0	0	**26**	-	0	0	0	0	**0**	-	2	0	0	0	**2**	-	0	0	0	0	**0**	-	28
% Articulated Trucks	1.5%	0%	0%	0%	**1.5%**	-	0%	0%	0%	0%	-	-	3.0%	0%	0%	0%	**2.2%**	-	0%	0%	0%	0%	**0%**	-	1.2%
Buses and Single-Unit Trucks	10	0	0	0	**10**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	10
% Buses and Single-Unit Trucks	0.6%	0%	0%	0%	**0.6%**	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.4%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk, L: Left, R: Right, T: Thru, U: U-Turn

Spur 601 at NB Loop 375 - TMC
Wed Apr 21, 2021
AM Peak (7:15 AM - 8:15 AM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827870, Location: 31.841256, -106.324246

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Spur 601 at NB Loop 375 - TMC
Wed Apr 21, 2021
PM Peak (4:45 PM - 5:45 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827870, Location: 31.841256, -106.324246

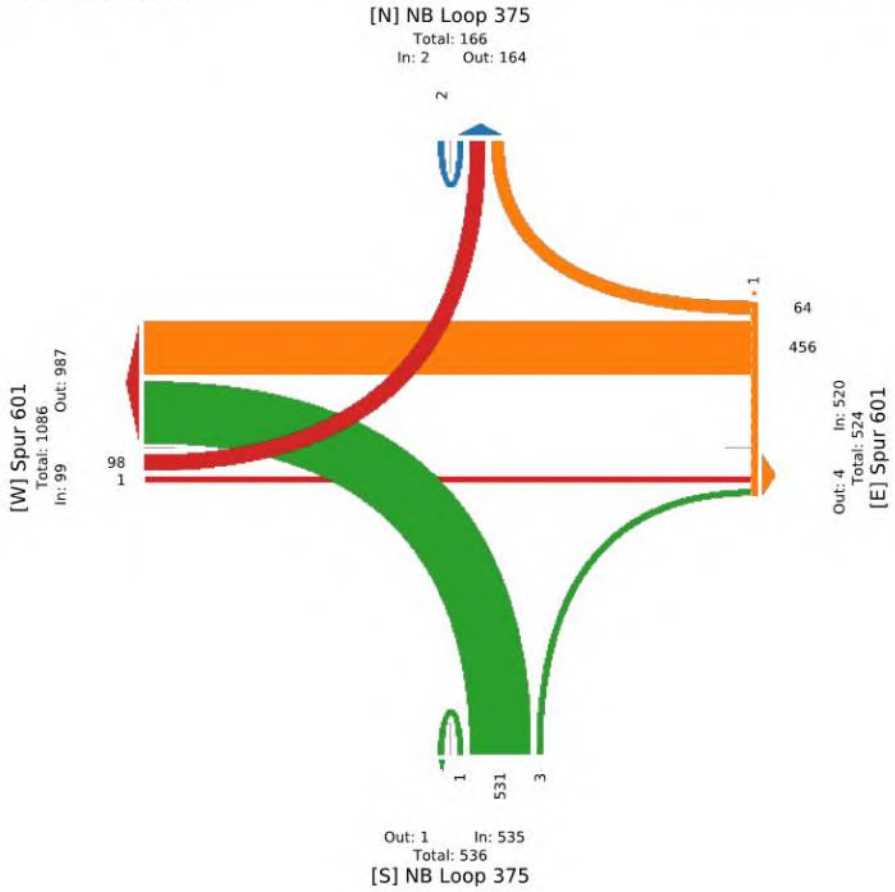
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	NB Loop 375 Northbound						NB Loop 375 Southbound						Spur 601 Eastbound						Spur 601 Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 4:45PM	148	0	1	1	**150**	0	0	0	0	0	**0**	0	18	0	0	0	**18**	0	0	81	18	0	**99**	0	**267**
5:00PM	105	0	0	0	**105**	0	0	0	0	1	**1**	0	25	0	0	0	**25**	0	0	135	13	0	**148**	0	**279**
5:15PM	153	0	0	0	**153**	0	0	0	0	0	**0**	0	36	1	0	0	**37**	0	0	138	19	0	**157**	1	**347**
5:30PM	125	0	2	0	**127**	0	0	0	0	1	**1**	0	19	0	0	0	**19**	0	0	102	14	0	**116**	0	**263**
Total	531	0	3	1	**535**	0	0	0	0	2	**2**	0	98	1	0	0	**99**	0	0	456	64	0	**520**	1	**1156**
% Approach	99.3%	0%	0.6%	0.2%	-	-	0%	0%	0%	100%	-	-	99.0%	1.0%	0%	0%	-	-	0%	87.7%	12.3%	0%	-	-	-
% Total	45.9%	0%	0.3%	0.1%	**46.3%**	-	0%	0%	0%	0.2%	**0.2%**	-	8.5%	0.1%	0%	0%	**8.6%**	-	0%	39.4%	5.5%	0%	**45.0%**	-	-
PHF	0.868	-	0.375	0.250	**0.874**	-	-	-	-	0.500	**0.500**	-	0.681	0.250	-	-	**0.669**	-	-	0.926	0.842	-	**0.828**	-	0.833
Lights	504	0	3	1	**508**	-	0	0	0	2	**2**	-	98	1	0	0	**99**	-	0	456	64	0	**520**	-	1129
% Lights	94.9%	0%	100%	100%	**95.0%**	-	0%	0%	0%	100%	**100%**	-	100%	100%	0%	0%	**100%**	-	0%	100%	100%	0%	**100%**	-	97.7%
Articulated Trucks	16	0	0	0	**16**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	16
% Articulated Trucks	3.0%	0%	0%	0%	**3.0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	1.4%
Buses and Single-Unit Trucks	11	0	0	0	**11**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	11
% Buses and Single-Unit Trucks	2.1%	0%	0%	0%	**2.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	1.0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk, L: Left, R: Right, T: Thru, U: U-Turn

Spur 601 at NB Loop 375 - TMC
Wed Apr 21, 2021
PM Peak (4:45 PM - 5:45 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827870, Location: 31.841256, -106.324246

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Loop 375 NB Access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827863, Location: 31.833017, -106.308966

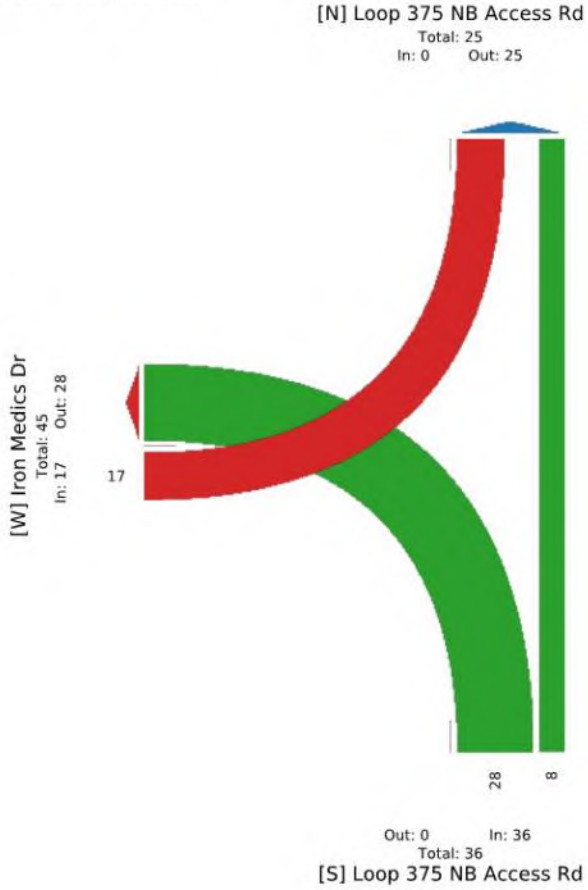
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Loop 375 NB Access Rd					Loop 375 NB Access Rd					Iron Medics Dr					
Direction	Northbound					Southbound					Eastbound					
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	App	Ped*	Int
2021-04-21 6:00AM	1	1	0	2	0	0	0	0	0	0	1	0	0	1	0	3
6:15AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6:30AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6:45AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	2	2	0	4	0	0	0	0	0	0	1	0	0	1	0	5
7:00AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:15AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:30AM	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	4
7:45AM	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Hourly Total	5	2	0	7	0	0	0	0	0	0	2	0	0	2	0	9
8:00AM	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	2
8:15AM	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	3
8:30AM	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	4
8:45AM	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	4
Hourly Total	8	0	0	8	0	0	0	0	0	0	5	0	0	5	0	13
4:00PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
4:15PM	2	1	0	3	0	0	0	0	0	0	1	0	0	1	0	4
4:30PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2
4:45PM	3	1	0	4	0	0	0	0	0	0	3	0	0	3	0	7
Hourly Total	7	4	0	11	0	0	0	0	0	0	4	0	0	4	0	15
5:00PM	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2
5:15PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1
5:30PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1
5:45PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Hourly Total	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	6
6:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15PM	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2
6:30PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
6:45PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1
Hourly Total	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	5
Total	28	8	0	36	0	0	0	0	0	0	17	0	0	17	0	53
% Approach	77.8%	22.2%	0%	-	-	0%	0%	0%	-	-	100%	0%	0%	-	-	-
% Total	52.8%	15.1%	0%	**67.9%**	-	0%	0%	0%	**0%**	-	32.1%	0%	0%	**32.1%**	-	-
Lights	27	7	0	**34**	-	0	0	0	**0**	-	16	0	0	**16**	-	50
% Lights	96.4%	87.5%	0%	**94.4%**	-	0%	0%	0%	-	-	94.1%	0%	0%	**94.1%**	-	94.3%
Articulated Trucks	1	0	0	**1**	-	0	0	0	**0**	-	0	0	0	**0**	-	1
% Articulated Trucks	3.6%	0%	0%	**2.8%**	-	0%	0%	0%	-	-	0%	0%	0%	**0%**	-	1.9%
Buses and Single-Unit Trucks	0	1	0	**1**	-	0	0	0	**0**	-	1	0	0	**1**	-	2
% Buses and Single-Unit Trucks	0%	12.5%	0%	**2.8%**	-	0%	0%	0%	-	-	5.9%	0%	0%	**5.9%**	-	3.8%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Loop 375 NB Access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827863, Location: 31.833017, -106.308966

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Loop 375 NB Access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
AM Peak (8 AM - 9 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827863, Location: 31.833017, -106.308966

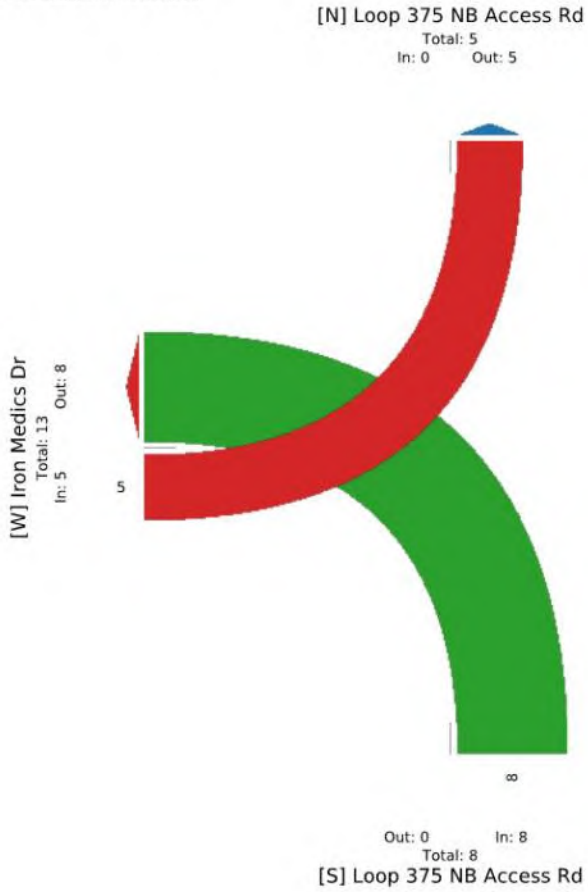
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Loop 375 NB Access Rd					Loop 375 NB Access Rd					Iron Medics Dr					
Direction	Northbound					Southbound					Eastbound					
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	App	Ped*	Int
2021-04-21 8:00AM	0	0	0	**0**	0	0	0	0	**0**	0	2	0	0	**2**	0	**2**
8:15AM	2	0	0	**2**	0	0	0	0	**0**	0	1	0	0	**1**	0	**3**
8:30AM	3	0	0	**3**	0	0	0	0	**0**	0	1	0	0	**1**	0	**4**
8:45AM	3	0	0	**3**	0	0	0	0	**0**	0	1	0	0	**1**	0	**4**
Total	8	0	0	**8**	0	0	0	0	**0**	0	5	0	0	**5**	0	**13**
% Approach	100%	0%	0%	-	-	0%	0%	0%	-	-	100%	0%	0%	-	-	-
% Total	61.5%	0%	0%	**61.5%**	-	0%	0%	0%	**0%**	-	38.5%	0%	0%	**38.5%**	-	-
PHF	0.667	-	-	**0.667**	-	-	-	-	-	-	0.625	-	-	**0.625**	-	0.813
Lights	7	0	0	**7**	-	0	0	0	**0**	-	4	0	0	**4**	-	11
% Lights	87.5%	0%	0%	**87.5%**	-	0%	0%	0%	-	-	80.0%	0%	0%	**80.0%**	-	84.6%
Articulated Trucks	1	0	0	**1**	-	0	0	0	**0**	-	0	0	0	**0**	-	1
% Articulated Trucks	12.5%	0%	0%	**12.5%**	-	0%	0%	0%	-	-	0%	0%	0%	**0%**	-	7.7%
Buses and Single-Unit Trucks	0	0	0	**0**	-	0	0	0	**0**	-	1	0	0	**1**	-	1
% Buses and Single-Unit Trucks	0%	0%	0%	**0%**	-	0%	0%	0%	-	-	20.0%	0%	0%	**20.0%**	-	7.7%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Loop 375 NB Access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
AM Peak (8 AM - 9 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827863, Location: 31.833017, -106.308966

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Loop 375 NB Access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
PM Peak (4 PM - 5 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827863, Location: 31.833017, -106.308966

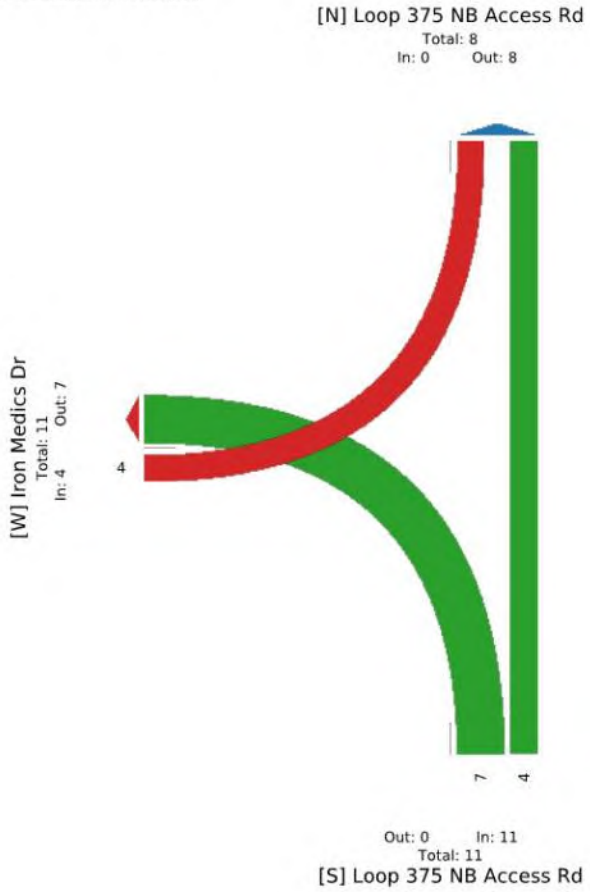
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Loop 375 NB Access Rd					Loop 375 NB Access Rd					Iron Medics Dr					
Direction	Northbound					Southbound					Eastbound					
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	App	Ped*	Int
2021-04-21 4:00PM	2	0	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	0	**2**
4:15PM	2	1	0	**3**	0	0	0	0	**0**	0	1	0	0	**1**	0	**4**
4:30PM	0	2	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	0	**2**
4:45PM	3	1	0	**4**	0	0	0	0	**0**	0	3	0	0	**3**	0	**7**
Total	7	4	0	**11**	0	0	0	0	**0**	0	4	0	0	**4**	0	**15**
% Approach	63.6%	36.4%	0%	-	-	0%	0%	0%	-	-	100%	0%	0%	-	-	-
% Total	46.7%	26.7%	0%	**73.3%**	-	0%	0%	0%	**0%**	-	26.7%	0%	0%	**26.7%**	-	-
PHF	0.583	0.500	-	**0.688**	-	-	-	-	-	-	0.333	-	-	**0.333**	-	0.536
Lights	7	4	0	**11**	-	0	0	0	**0**	-	4	0	0	**4**	-	15
% Lights	100%	100%	0%	**100%**	-	0%	0%	0%	-	-	100%	0%	0%	**100%**	-	100%
Articulated Trucks	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Articulated Trucks	0%	0%	0%	**0%**	-	0%	0%	0%	-	-	0%	0%	0%	**0%**	-	0%
Buses and Single-Unit Trucks	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Buses and Single-Unit Trucks	0%	0%	0%	**0%**	-	0%	0%	0%	-	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Loop 375 NB Access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
PM Peak (4 PM - 5 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827863, Location: 31.833017, -106.308966

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Loop 375 SB access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827864, Location: 31.829888, -106.310329

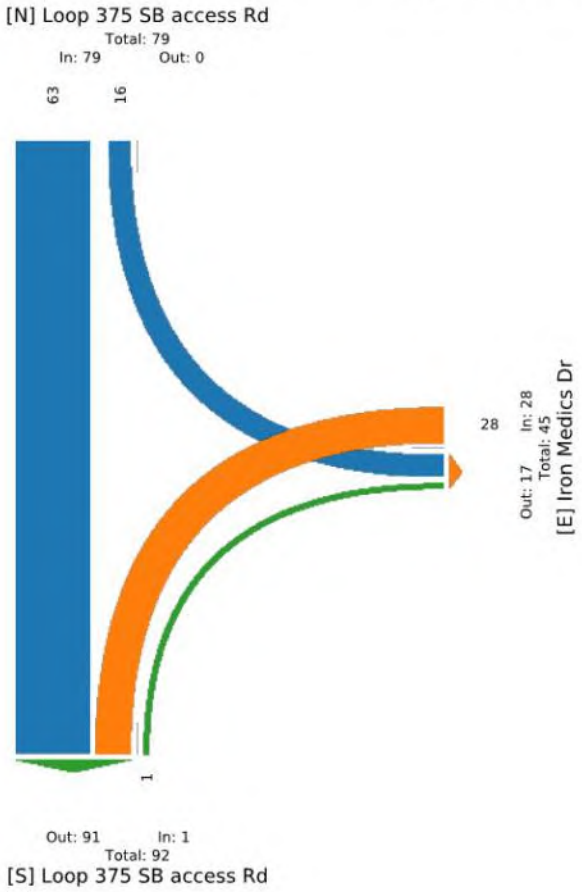
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Loop 375 SB access Rd						Loop 375 SB access Rd						Iron Medics Dr						Iron Medics Dr						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 6:00AM	0	0	0	0	**0**	0	1	0	0	0	**1**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	2
6:15AM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	**1**
6:30AM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**0**
6:45AM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**0**
Hourly Total	0	0	0	0	**0**	0	1	0	0	0	**1**	0	0	0	0	0	**0**	0	2	0	0	0	**2**	0	**3**
7:00AM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**0**
7:15AM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**0**
7:30AM	0	0	0	0	**0**	0	2	1	0	0	**3**	0	0	0	0	0	**0**	0	2	0	0	0	**2**	0	**5**
7:45AM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	2	0	0	0	**2**	0	**2**
Hourly Total	0	0	0	0	**0**	0	2	1	0	0	**3**	0	0	0	0	0	**0**	0	4	0	0	0	**4**	0	**7**
8:00AM	0	0	0	0	**0**	0	2	0	0	0	**2**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	**3**
8:15AM	0	0	0	0	**0**	0	1	2	0	0	**3**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	**4**
8:30AM	0	0	0	0	**0**	0	1	0	0	0	**1**	0	0	0	0	0	**0**	0	4	0	0	0	**4**	0	**5**
8:45AM	0	0	1	0	**1**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	3	0	0	0	**3**	0	**4**
Hourly Total	0	0	1	0	**1**	0	4	2	0	0	**6**	0	0	0	0	0	**0**	0	9	0	0	0	**9**	0	**16**
4:00PM	0	0	0	0	**0**	0	0	1	0	0	**1**	0	0	0	0	0	**0**	0	2	0	0	0	**2**	0	**3**
4:15PM	0	0	0	0	**0**	0	0	2	0	0	**2**	0	0	0	0	0	**0**	0	2	0	0	0	**2**	0	**4**
4:30PM	0	0	0	0	**0**	0	1	1	0	0	**2**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**2**
4:45PM	0	0	0	0	**0**	0	3	12	0	0	**15**	0	0	0	0	0	**0**	0	3	0	0	0	**3**	0	**18**
Hourly Total	0	0	0	0	**0**	0	4	16	0	0	**20**	0	0	0	0	0	**0**	0	7	0	0	0	**7**	0	**27**
5:00PM	0	0	0	0	**0**	0	1	5	0	0	**6**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**6**
5:15PM	0	0	0	0	**0**	0	1	25	0	0	**26**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	**27**
5:30PM	0	0	0	0	**0**	0	1	12	0	0	**13**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**13**
5:45PM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	2	0	0	0	**2**	0	**2**
Hourly Total	0	0	0	0	**0**	0	3	42	0	0	**45**	0	0	0	0	0	**0**	0	3	0	0	0	**3**	0	**48**
6:00PM	0	0	0	0	**0**	0	0	1	0	0	**1**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**1**
6:15PM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	**1**
6:30PM	0	0	0	0	**0**	0	1	0	0	0	**1**	0	0	0	0	0	**0**	0	2	0	0	0	**2**	0	**3**
6:45PM	0	0	0	0	**0**	0	1	1	0	0	**2**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**2**
Hourly Total	0	0	0	0	**0**	0	2	2	0	0	**4**	0	0	0	0	0	**0**	0	3	0	0	0	**3**	0	**7**
Total	0	0	1	0	**1**	0	16	63	0	0	**79**	0	0	0	0	0	**0**	0	28	0	0	0	**28**	0	**108**
% Approach	0%	0%	100%	0%	-		20.3%	79.7%	0%	0%	-		0%	0%	0%	0%	-		100%	0%	0%	0%	-		
% Total	0%	0%	0.9%	0%	**0.9%**		14.8%	58.3%	0%	0%	**73.1%**		0%	0%	0%	0%	**0%**		25.9%	0%	0%	0%	**25.9%**		
Lights	0	0	1	0	**1**		15	63	0	0	**78**		0	0	0	0	**0**		27	0	0	0	**27**		106
% Lights	0%	0%	100%	0%	**100%**		93.8%	100%	0%	0%	**98.7%**		0%	0%	0%	0%	-		96.4%	0%	0%	0%	**96.4%**		98.1%
Articulated Trucks	0	0	0	0	**0**		0	0	0	0	**0**		0	0	0	0	**0**		1	0	0	0	**1**		1
% Articulated Trucks	0%	0%	0%	0%	**0%**		0%	0%	0%	0%	**0%**		0%	0%	0%	0%	-		3.6%	0%	0%	0%	**3.6%**		0.9%
Buses and Single-Unit Trucks	0	0	0	0	**0**		1	0	0	0	**1**		0	0	0	0	**0**		0	0	0	0	**0**		1
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**		6.3%	0%	0%	0%	**1.3%**		0%	0%	0%	0%	-		0%	0%	0%	0%	**0%**		0.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Loop 375 SB access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
Full Length (6 AM-9 AM, 4 PM-7 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827864, Location: 31.829888, -106.310329

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Loop 375 SB access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
AM Peak (8 AM - 9 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827864, Location: 31.829888, -106.310329

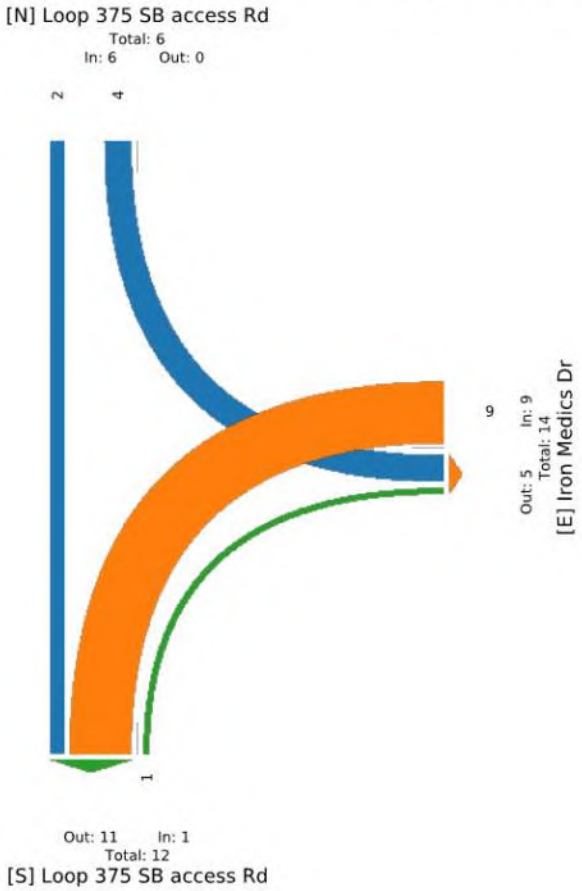
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Loop 375 SB access Rd Northbound						Loop 375 SB access Rd Southbound						Iron Medics Dr Eastbound						Iron Medics Dr Westbound						
Direction																									
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 8:00AM	0	0	0	0	**0**	0	2	0	0	0	**2**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	**3**
8:15AM	0	0	0	0	**0**	0	1	2	0	0	**3**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	**4**
8:30AM	0	0	0	0	**0**	0	1	0	0	0	**1**	0	0	0	0	0	**0**	0	4	0	0	0	**4**	0	**5**
8:45AM	0	0	1	0	**1**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	3	0	0	0	**3**	0	**4**
Total	0	0	1	0	**1**	0	4	2	0	0	**6**	0	0	0	0	0	**0**	0	9	0	0	0	**9**	0	**16**
% Approach	0%	0%	100%	0%	-	-	66.7%	33.3%	0%	0%	-	-	0%	0%	0%	0%	-	-	100%	0%	0%	0%	-	-	-
% Total	0%	0%	6.3%	0%	**6.3%**	-	25.0%	12.5%	0%	0%	**37.5%**	-	0%	0%	0%	0%	**0%**	-	56.3%	0%	0%	0%	**56.3%**	-	-
PHF	-	-	0.250	-	**0.250**	-	0.500	0.250	-	-	**0.500**	-	-	-	-	-	-	-	0.563	-	-	-	**0.563**	-	0.800
Lights	0	0	1	0	**1**	-	3	2	0	0	**5**	-	0	0	0	0	**0**	-	8	0	0	0	**8**	-	14
% Lights	0%	0%	100%	0%	**100%**	-	75.0%	100%	0%	0%	**83.3%**	-	0%	0%	0%	0%	-	-	88.9%	0%	0%	0%	**88.9%**	-	87.5%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1	0	0	0	**1**	-	1
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	-	-	11.1%	0%	0%	0%	**11.1%**	-	6.3%
Buses and Single-Unit Trucks	0	0	0	0	**0**	-	1	0	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	-	25.0%	0%	0%	0%	**16.7%**	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	**0%**	-	6.2%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Loop 375 SB access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
AM Peak (8 AM - 9 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827864, Location: 31.829888, -106.310329

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US



Loop 375 SB access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827864, Location: 31.829888, -106.310329

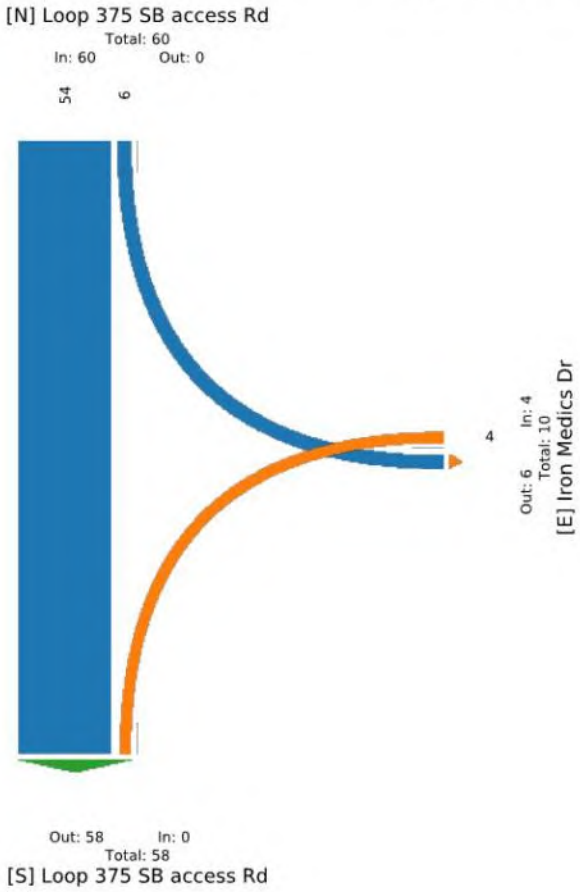
CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

Leg	Loop 375 SB access Rd						Loop 375 SB access Rd						Iron Medics Dr						Iron Medics Dr						
Direction	Northbound						Southbound						Eastbound						Westbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2021-04-21 4:45PM	0	0	0	0	**0**	0	3	12	0	0	**15**	0	0	0	0	0	**0**	0	3	0	0	0	**3**	0	**18**
5:00PM	0	0	0	0	**0**	0	1	5	0	0	**6**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**6**
5:15PM	0	0	0	0	**0**	0	1	25	0	0	**26**	0	0	0	0	0	**0**	0	1	0	0	0	**1**	0	**27**
5:30PM	0	0	0	0	**0**	0	1	12	0	0	**13**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**13**
Total	0	0	0	0	**0**	0	6	54	0	0	**60**	0	0	0	0	0	**0**	0	4	0	0	0	**4**	0	**64**
% Approach	0%	0%	0%	0%	-	-	10.0%	90.0%	0%	0%	-	-	0%	0%	0%	0%	-	-	100%	0%	0%	0%	-	-	-
% Total	0%	0%	0%	0%	**0%**	-	9.4%	84.4%	0%	0%	**93.8%**	-	0%	0%	0%	0%	**0%**	-	6.3%	0%	0%	0%	**6.3%**	-	-
PHF	-	-	-	-	-	-	0.500	0.540	-	-	**0.577**	-	-	-	-	-	-	-	0.333	-	-	-	**0.333**	-	0.593
Lights	0	0	0	0	**0**	-	6	54	0	0	**60**	-	0	0	0	0	**0**	-	4	0	0	0	**4**	-	64
% Lights	0%	0%	0%	0%	-	-	100%	100%	0%	0%	**100%**	-	0%	0%	0%	0%	-	-	100%	0%	0%	0%	**100%**	-	100%
Articulated Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Articulated Trucks	0%	0%	0%	0%	-	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	**0%**	-	0%
Buses and Single-Unit Trucks	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Buses and Single-Unit Trucks	0%	0%	0%	0%	-	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk, L: Left, R: Right, T: Thru, U: U-Turn

Loop 375 SB access Rd at Iron Medics Dr - TMC
Wed Apr 21, 2021
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 827864, Location: 31.829888, -106.310329

CJ Hensch & Associates, Inc.
Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave., Pasadena, TX, 77503, US

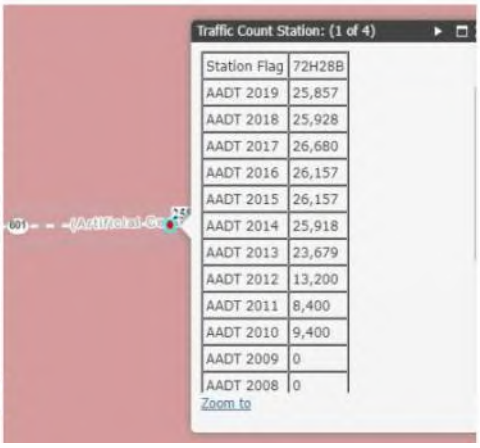


F Average Annual Growth Rate & COVID-19 Adjustment Factor Calculations

Source: TxDOT Statewide Planning Map

SP 601 near LP 375 (in the vicinity of the site)

Year	AADT	Vol. Difference	% Difference.
2019	25,857	-71	-0.27%
2018	25,928	-752	-2.82%
2017	26,680	523	2.00%
2016	26,157	0	0.00%
2015	26,157	239	0.92%
2014	25,918	2,239	9.46%
2013	23,679	10,479	79.39%
2012	13,200	4,800	57.14%
2011	8,400	-1,000	-10.64%
2010	9,400		
2014-2019 Average Yearly Growth Rate:		**363**	**2%**
(other years are outliers)			



Source: TxDOT Statewide Planning Map

FM 1942 (in the vicinity of the site)

Year	Est. 24 Hr Volume	Vol. Difference	% Difference.
2021 (projected)	12,482	245	2.00%
2020 (projected)	12,237	240	2.00%
2019 (TMCs requested from City of El Paso)	11,997		
2014-2019 Average Yearly Growth Rate:			2%

	Est. 24 Hr Volume	Vol. Difference	% Difference.
2021 TMCs (actual)	12,000	-482	-4.01%

Recommended COVID Ajustment Factor:	1.04

G Trip Assignment (PTV Vistro Exhibits)

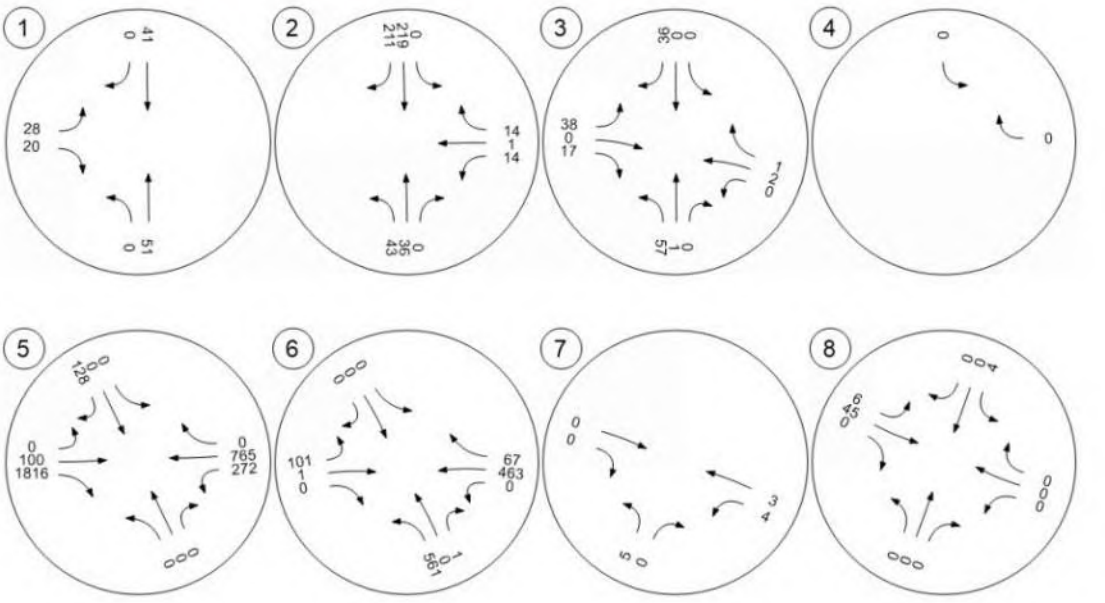
- Scenario 1: Existing PM Peak Hour
- Scenario 2: Existing AM Peak Hour
- Scenario 3: 2027 Opening Year (No Build) PM Peak Hour
- Scenario 4: 2027 Opening Year (No Build) AM Peak Hour
- Scenario 5: 2027 Opening Year (Build) PM Peak Hour
- Scenario 6: 2027 Opening Year (Build) AM Peak Hour
- Scenario 7: 2032 Future Year (5 Years After Opening) PM Peak Hour
- Scenario 8: 2032 Future Year (5 Years After Opening) AM Peak Hour

Generated with PTV VISTRO

Scenario 1: 1 1 Existing PM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Base Volume



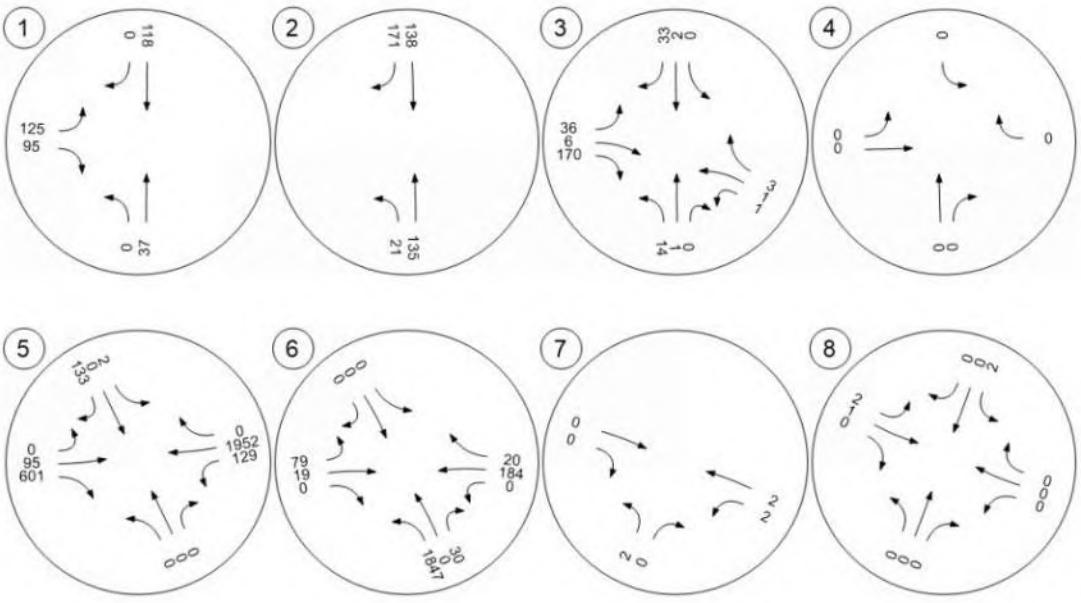
1

Generated with PTV VISTRO

Scenario 2: 2 2 2 Existing AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Base Volume



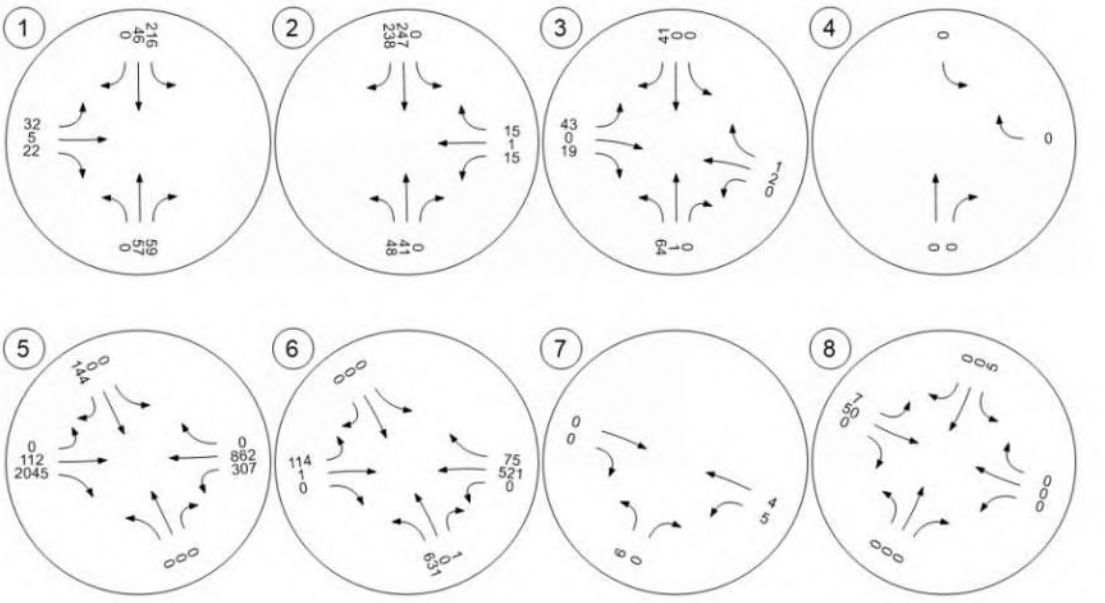
1

Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 3: 3 3 3 3 Opening Year PM Peak Hour

Traffic Volume - Base Volume



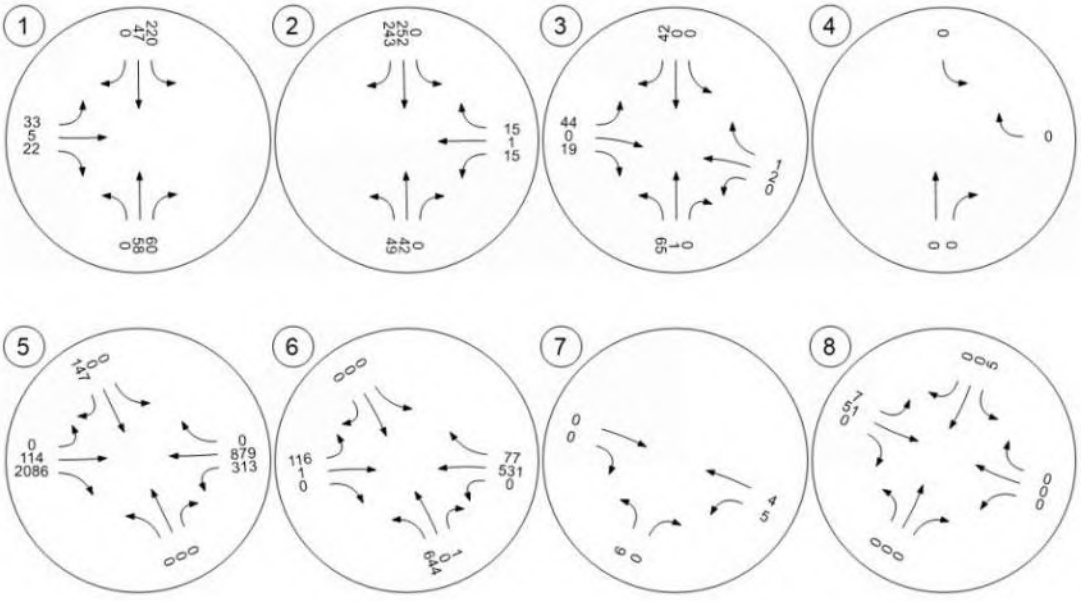
1

Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 3: 3 3 3 3 Opening Year PM Peak Hour

Traffic Volume - Future Background Volume



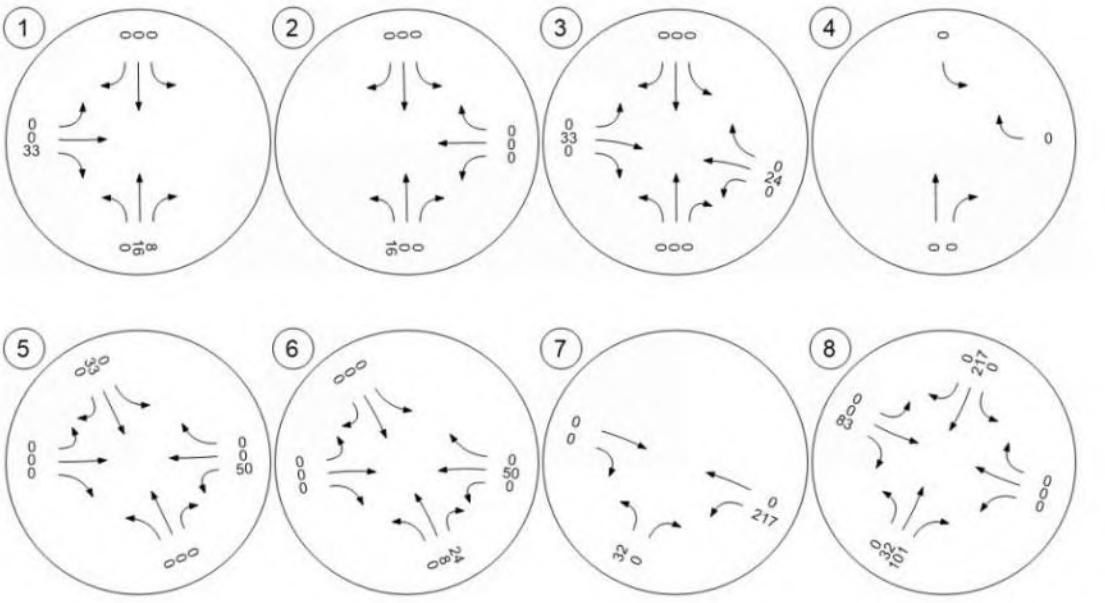
3

Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 3: 3 3 3 3 Opening Year PM Peak Hour

Traffic Volume - Net New Site Trips

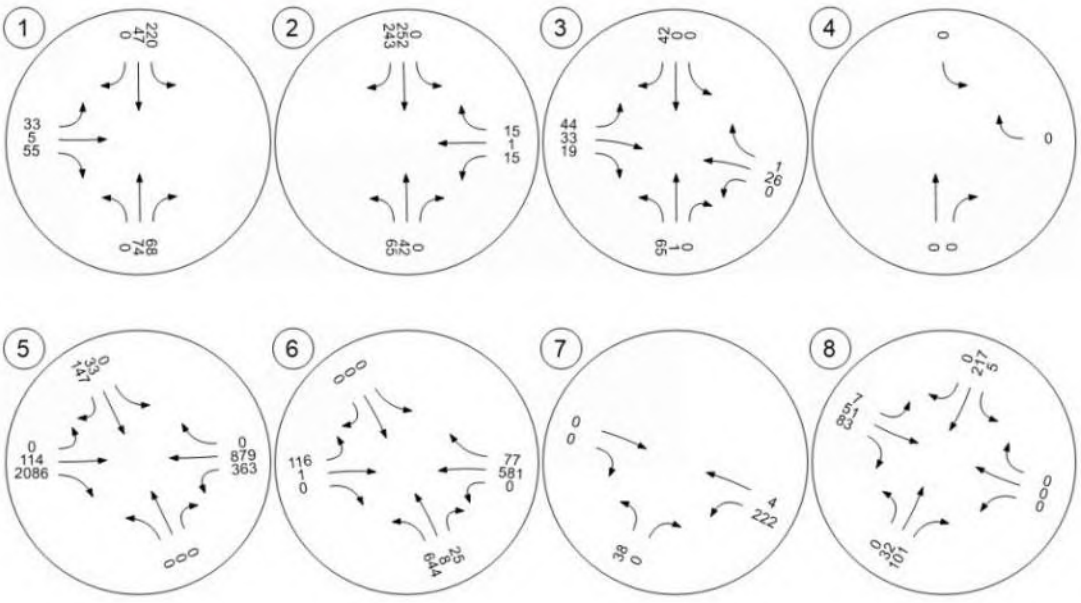


Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 3: 3 3 3 3 Opening Year PM Peak Hour

Traffic Volume - Future Total Volume



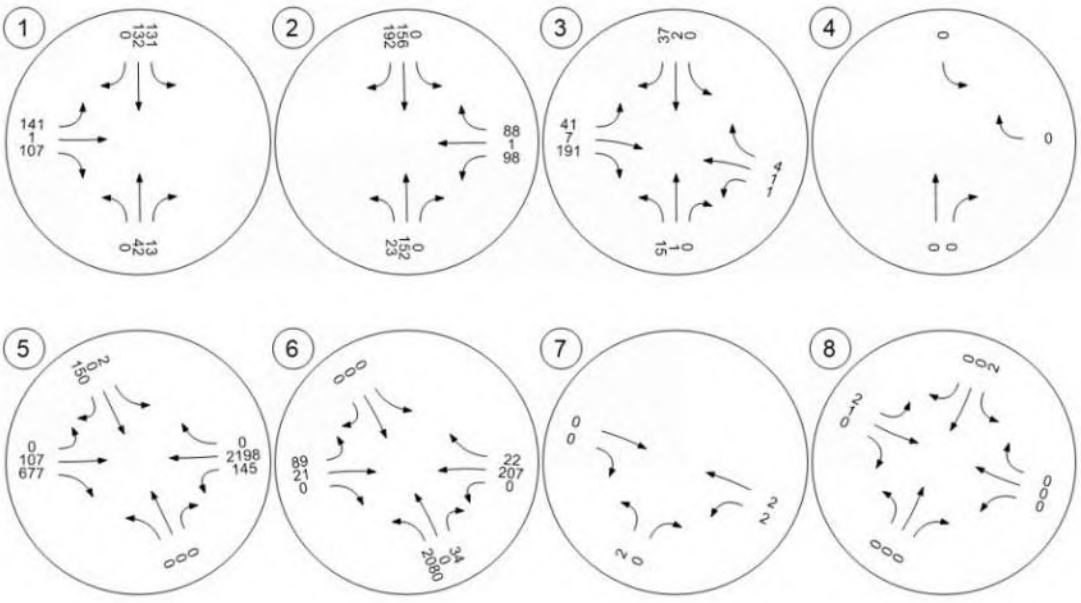
7

Generated with PTV VISTRO

Scenario 4: 4 4 Opening Year AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Base Volume



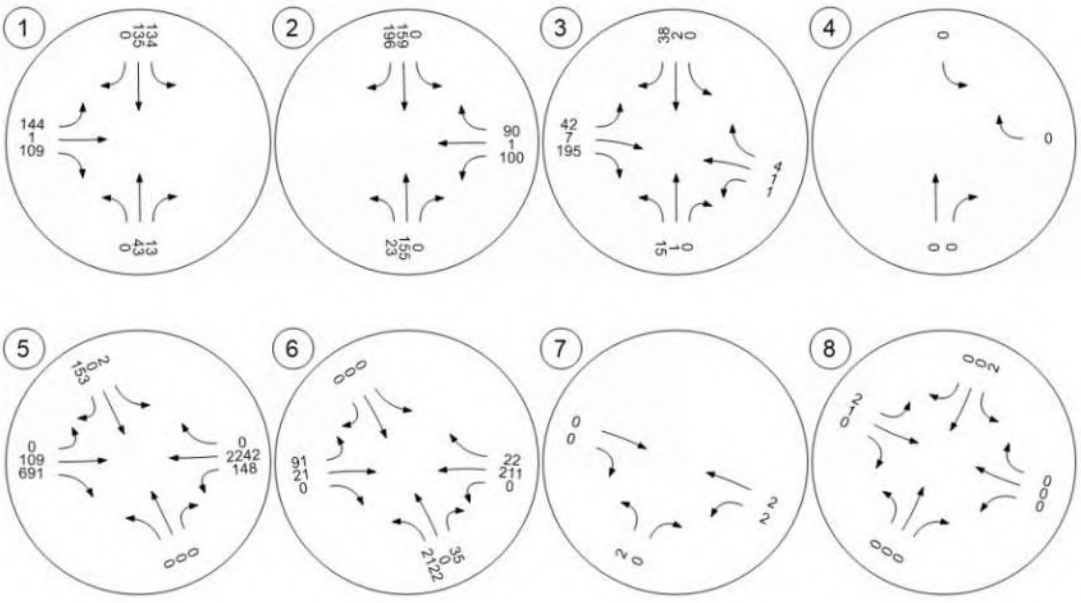
1

Generated with PTV VISTRO

Scenario 4: 4 4 Opening Year AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Future Background Volume

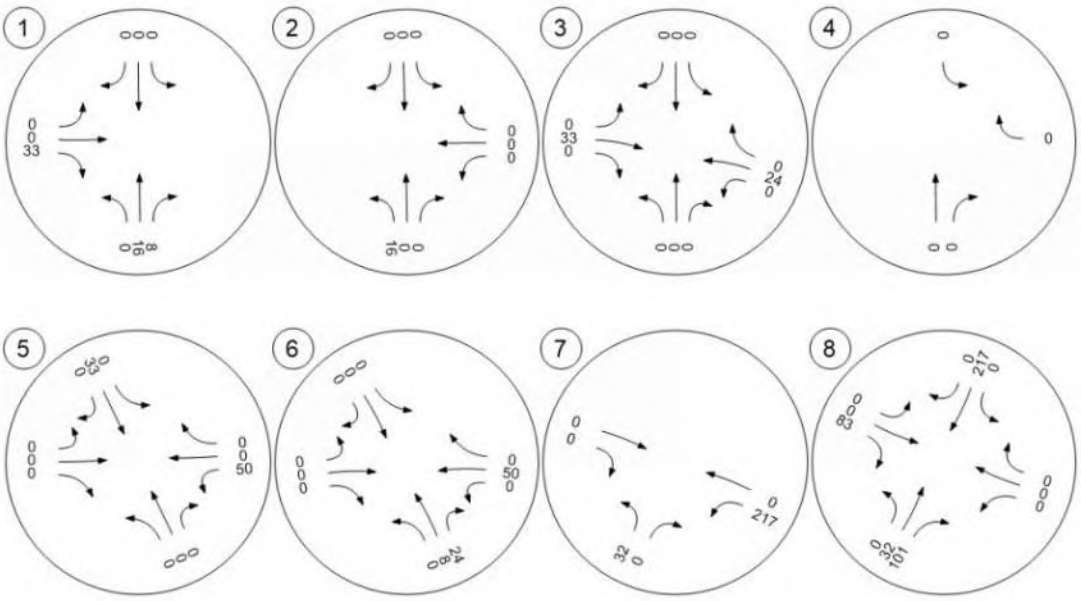


Generated with PTV VISTRO

Scenario 4: 4 4 Opening Year AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Net New Site Trips

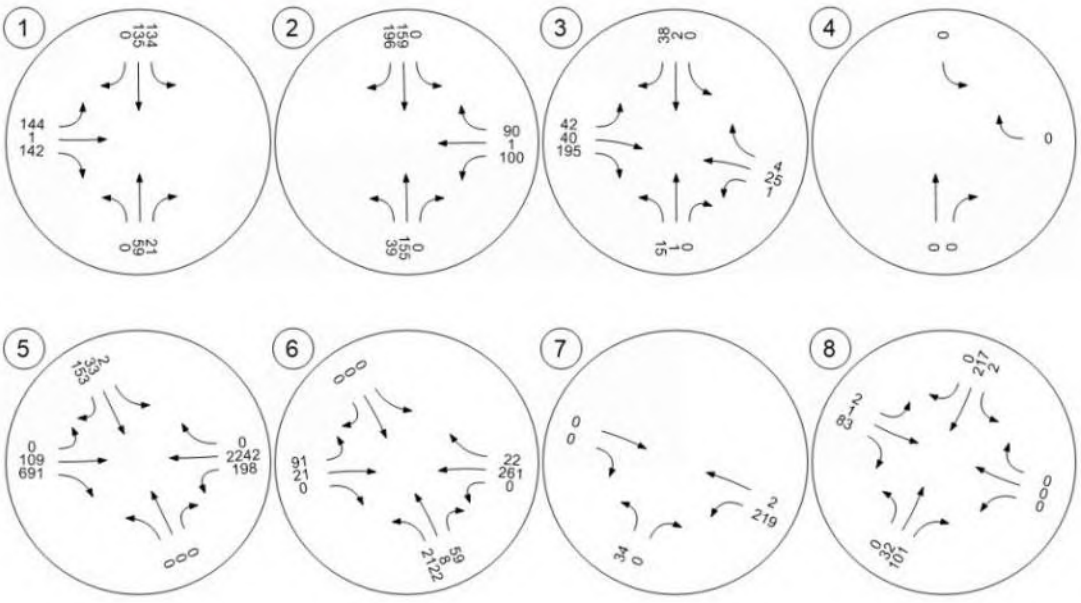


Generated with PTV VISTRO

Scenario 4: 4 4 Opening Year AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Future Total Volume



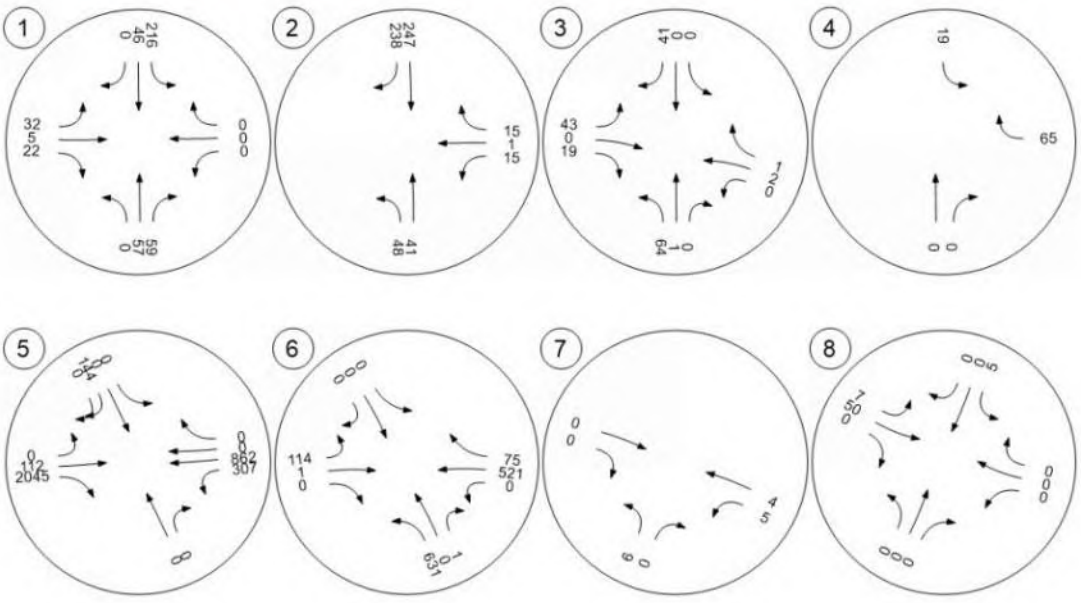
7

Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 5: 5 5 2027 (Build) PM Peak Hour

Traffic Volume - Base Volume



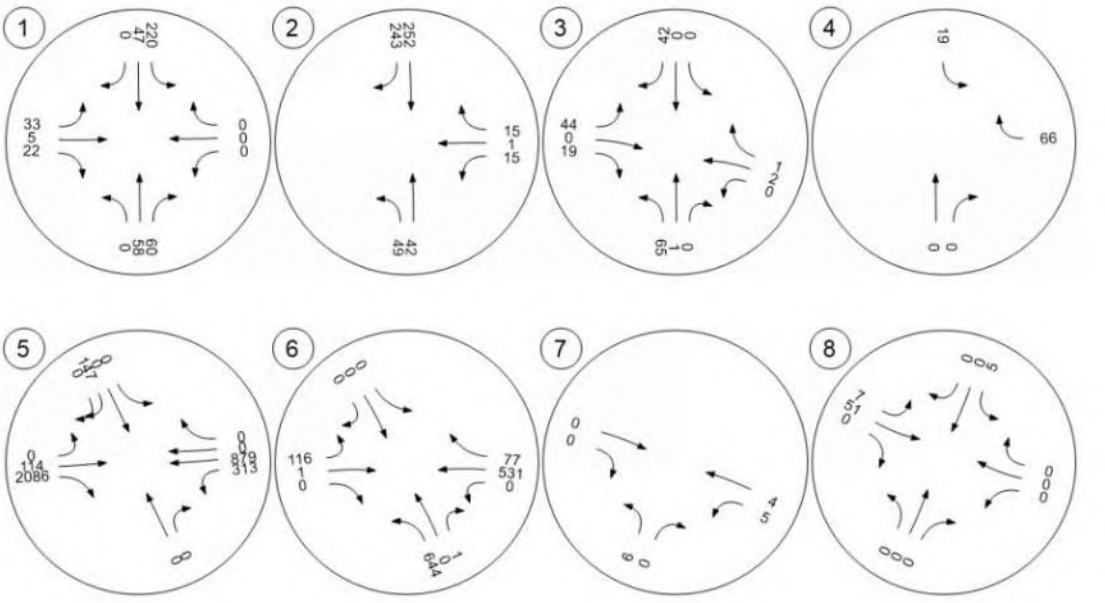
1

Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 5: 5 5 2027 (Build) PM Peak Hour

Traffic Volume - Future Background Volume

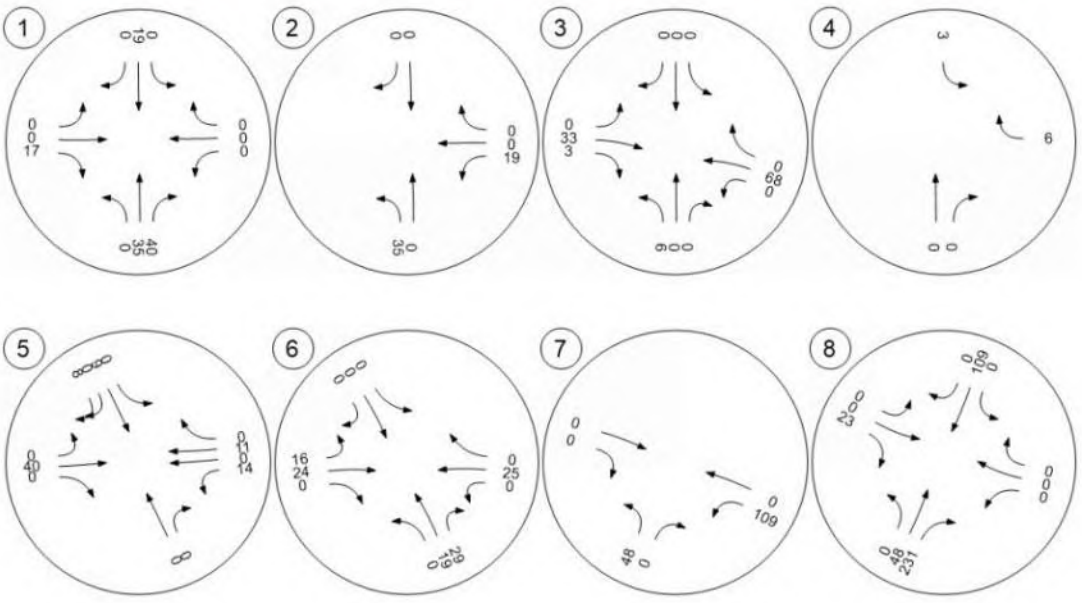


Generated with PTV VISTRO

Scenario 5: 5 5 2027 (Build) PM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Net New Site Trips

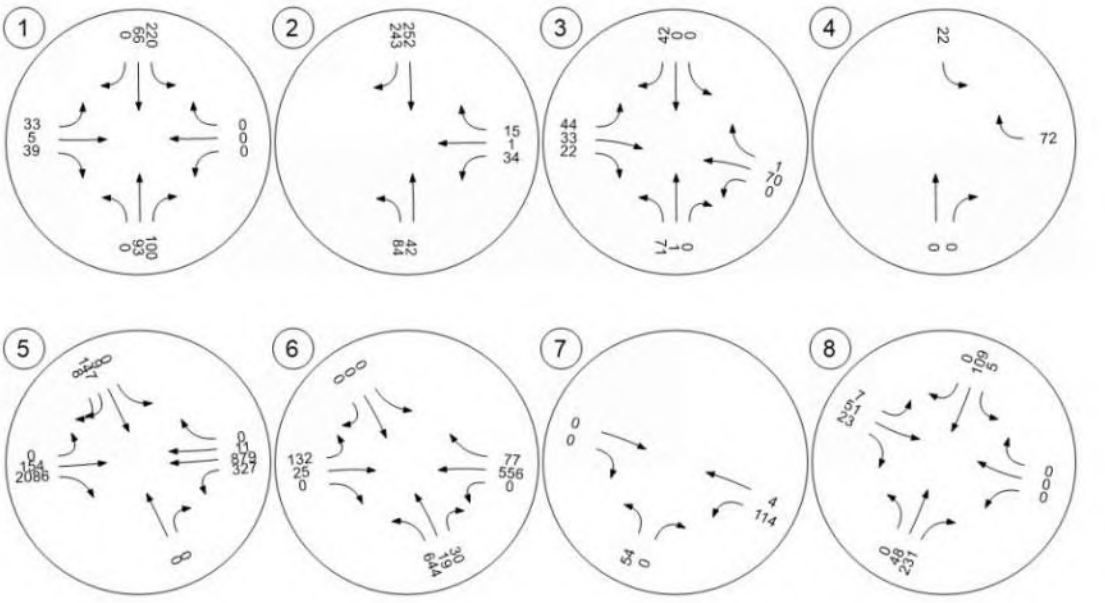


Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 5: 5 5 2027 (Build) PM Peak Hour

Traffic Volume - Future Total Volume

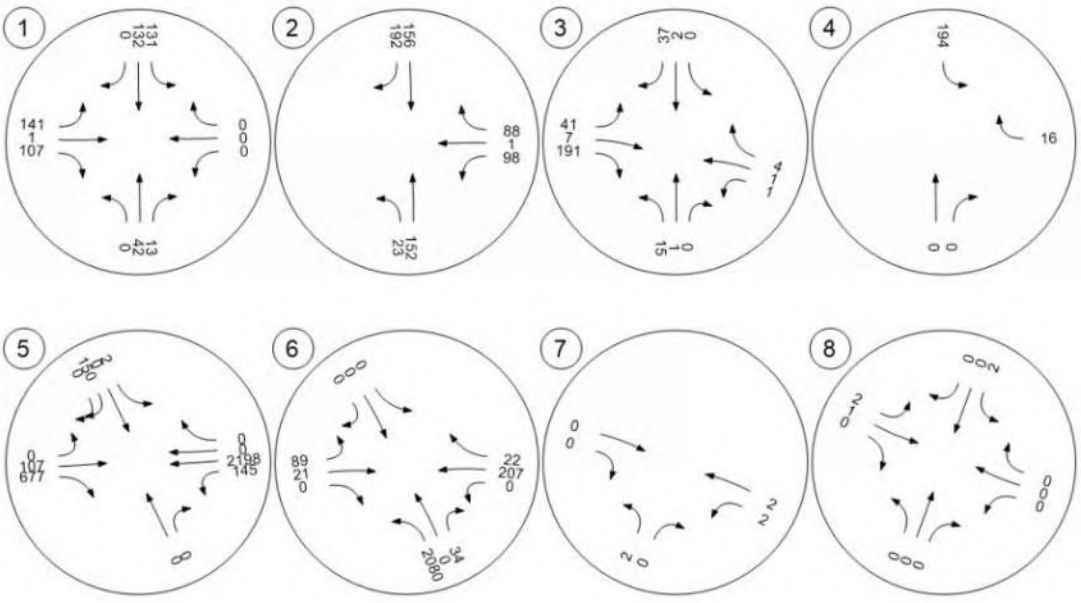


Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 6: 6 6 2027 (Build) AM Peak Hour

Traffic Volume - Base Volume



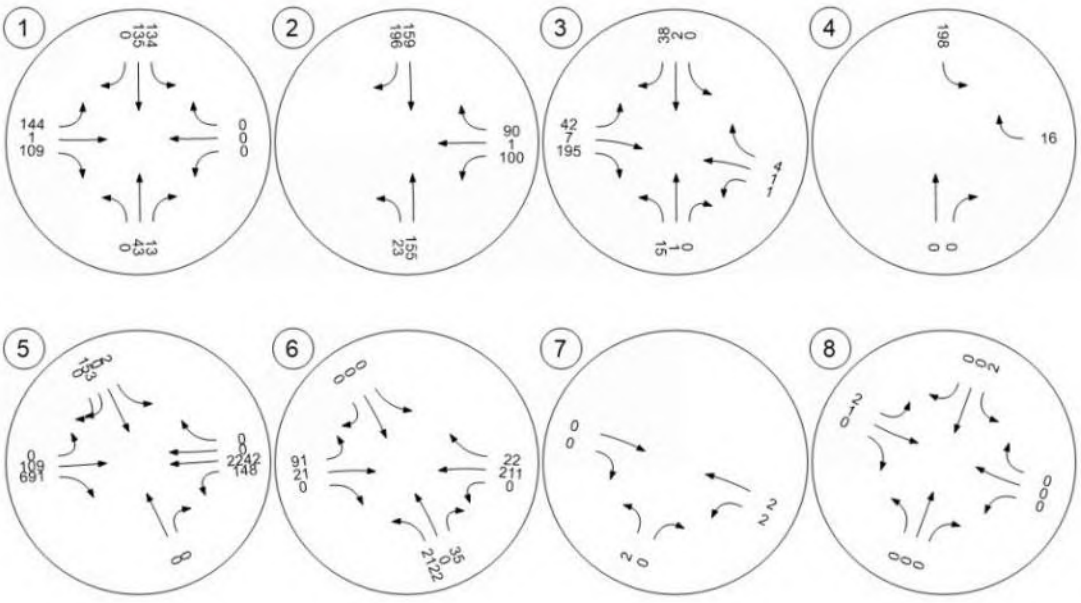
1

Generated with PTV VISTRO

Scenario 6: 6 6 2027 (Build) AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Future Background Volume

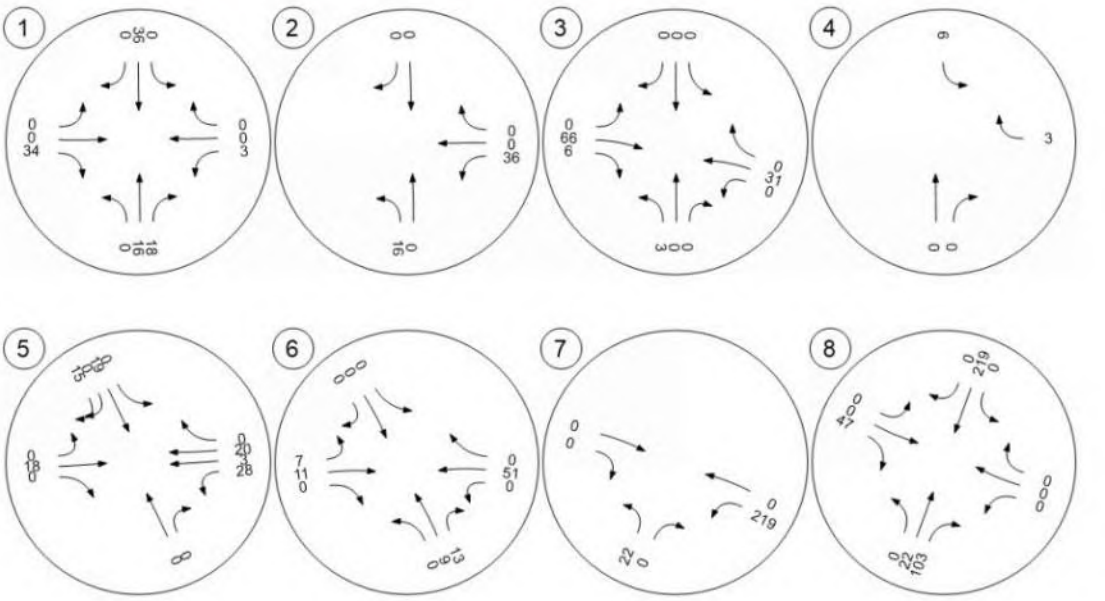


Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 6: 6 6 2027 (Build) AM Peak Hour

Traffic Volume - Net New Site Trips

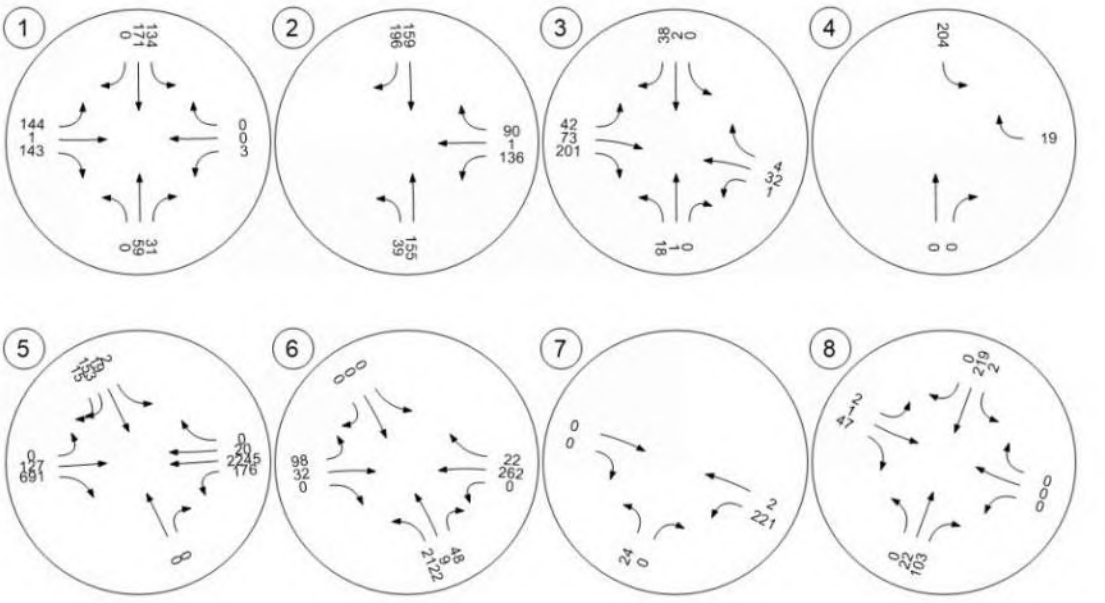


Generated with PTV VISTRO

Scenario 6: 6 6 2027 (Build) AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Future Total Volume

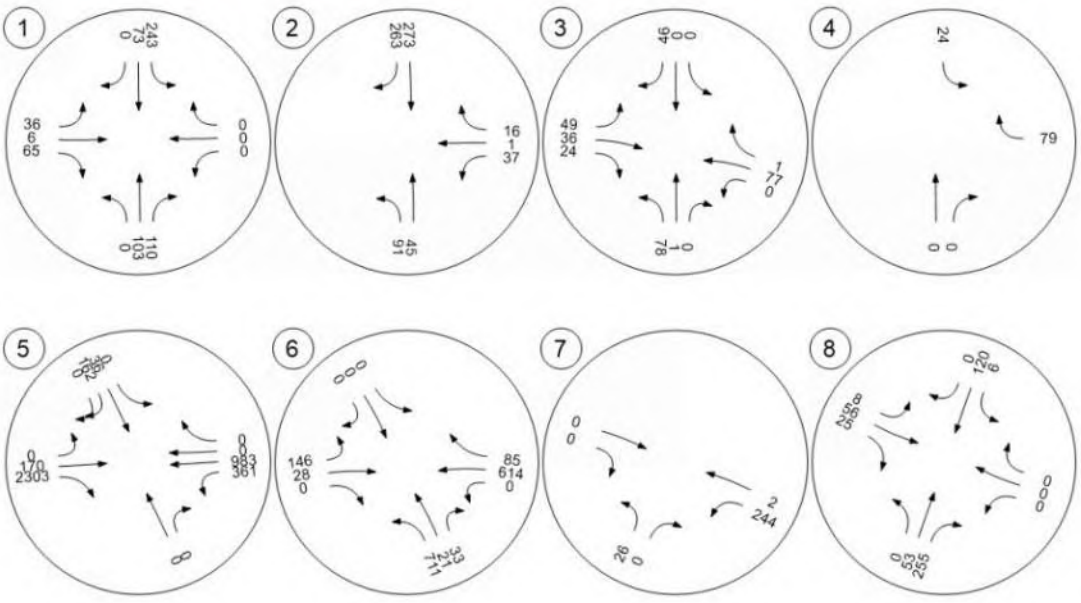


Generated with PTV VISTRO

Scenario 7: 7 7 2032 PM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Base Volume



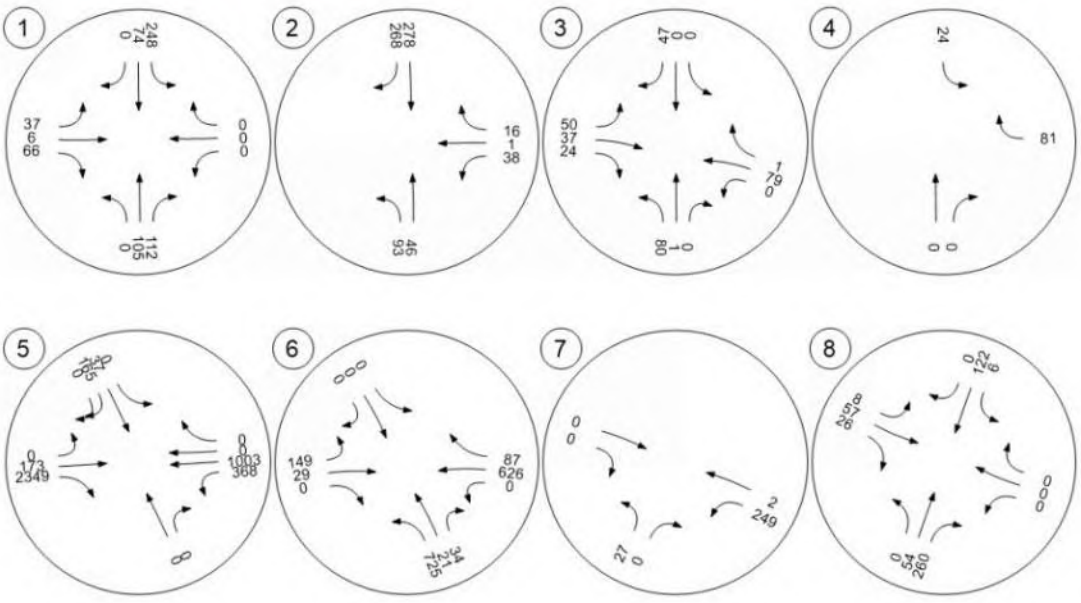
1

Generated with PTV VISTRO

Scenario 7: 7 7 2032 PM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Future Background Volume

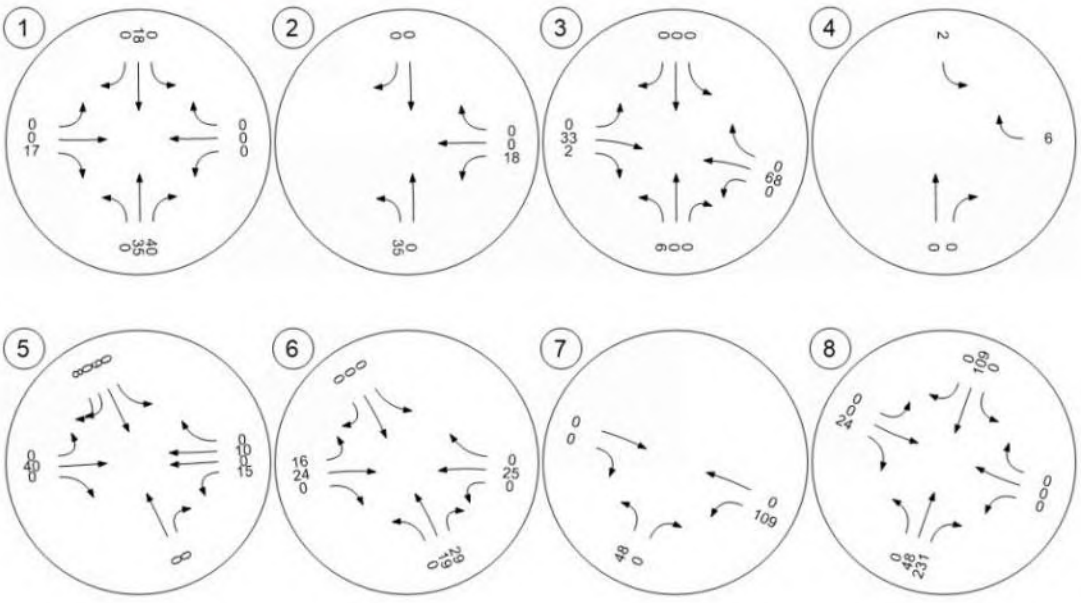


Generated with PTV VISTRO

Scenario 7: 7 7 2032 PM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Net New Site Trips

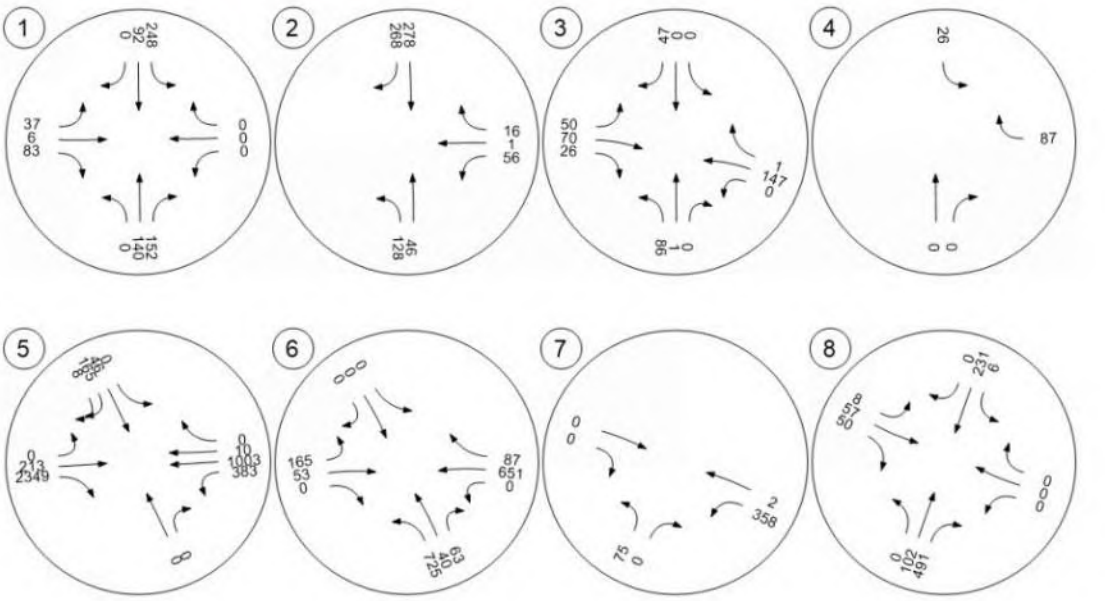


Generated with PTV VISTRO

Scenario 7: 7 7 2032 PM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Future Total Volume



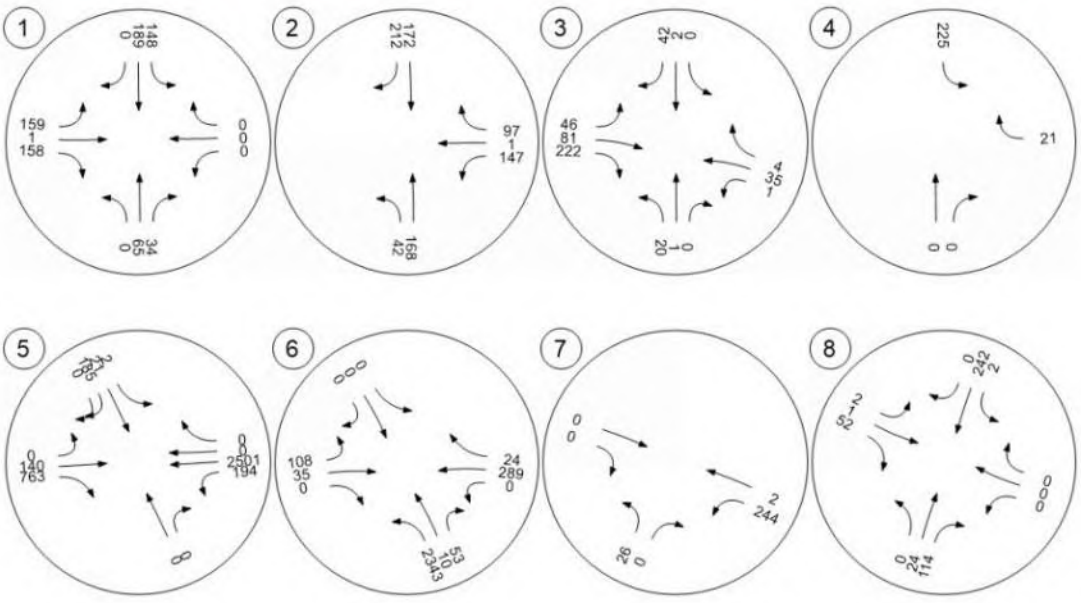
7

Generated with PTV VISTRO

Scenario 8: 8 8 2032 AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Base Volume



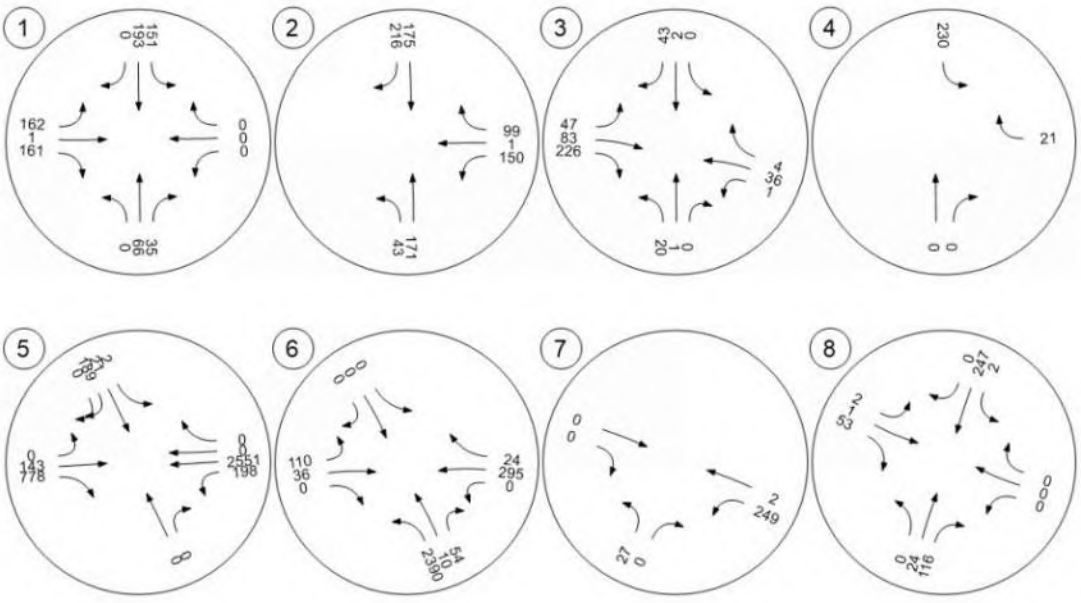
1

Generated with PTV VISTRO

Scenario 8: 8 8 2032 AM Peak Hour

Version 2021 (SP 0-1)

Traffic Volume - Future Background Volume

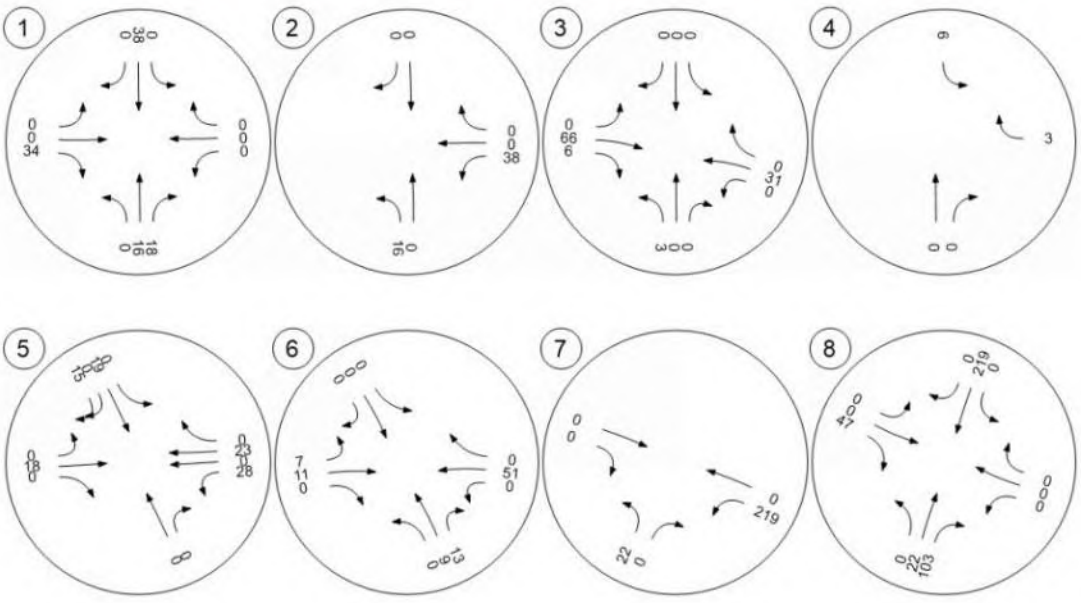


Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 8: 8 8 2032 AM Peak Hour

Traffic Volume - Net New Site Trips

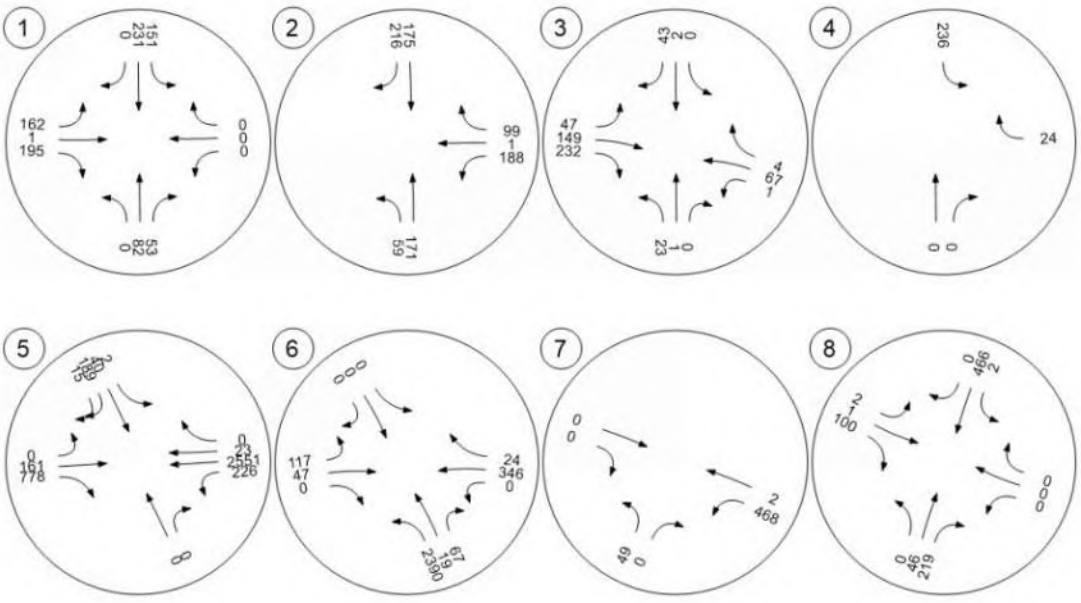


Generated with PTV VISTRO

Version 2021 (SP 0-1)

Scenario 8: 8 8 2032 AM Peak Hour

Traffic Volume - Future Total Volume



H Synchro Summary Reports

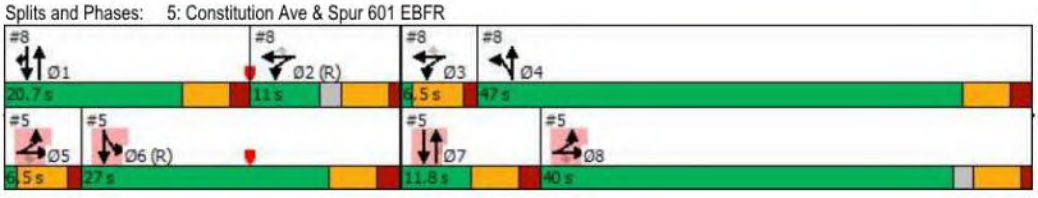
Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

AM Existing Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1	95	0	0	0	0	37	11	116	118	0
Future Volume (vph)	125	1	95	0	0	0	0	37	11	116	118	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.953								0.950		
Satd. Flow (prot)	1681	1686	1583	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.953								0.950		
Satd. Flow (perm)	1681	1686	1583	0	0	0	0	3539	1583	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			178						253			
Link Speed (mph)		30			35			35			30	
Link Distance (ft)		148			245			425			300	
Travel Time (s)		3.4			4.8			8.3			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	1	103	0	0	0	0	40	12	126	128	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	68	69	103	0	0	0	0	40	12	126	128	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	5 8	5 8						7		6	6 7	
Permitted Phases			5 8						7			
Total Split (s)								11.8	11.8	27.0		
Total Lost Time (s)								5.8	5.8	6.0		
Act Effct Green (s)	15.8	15.8	15.8					6.0	6.0	47.9	59.7	
Actuated g/C Ratio	0.18	0.18	0.18					0.07	0.07	0.55	0.69	
v/c Ratio	0.22	0.23	0.24					0.16	0.03	0.13	0.05	
Control Delay	31.6	31.6	1.8					39.9	0.2	4.2	1.1	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	31.6	31.6	1.8					39.9	0.2	4.2	1.1	
LOS	C	C	A					D	A	A	A	
Approach Delay		18.8						30.7			2.6	
Approach LOS		B						C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 87			
Actuated Cycle Length: 87			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 34.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Constitution Ave & Spur 601 EBFR



Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

AM Existing Peak Hour
05/28/2021

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	1	2	3	4	5	8
Permitted Phases						
Total Split (s)	20.7	11.0	6.5	47.0	6.5	40.0
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

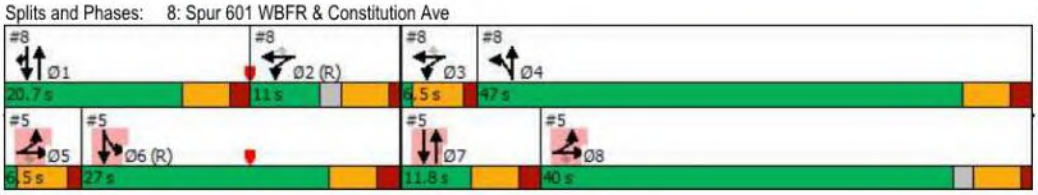
Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

AM Existing Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	87	1	78	21	135	0	0	138	171
Future Volume (vph)	0	0	0	87	1	78	21	135	0	0	138	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1681	1686	1583	1770	3539	0	0	3539	1583
Flt Permitted				0.950	0.953		0.950					
Satd. Flow (perm)	0	0	0	1681	1686	1583	1770	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						178						186
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		139			242			300			606	
Travel Time (s)		3.2			5.5			6.8			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	95	1	85	23	147	0	0	150	186
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	0	0	48	48	85	23	147	0	0	150	186
Turn Type				Split	NA	Perm	Prot	NA			NA	Prot
Protected Phases				2 3	2 3		4	1 4			1	1
Permitted Phases						2 3						
Total Split (s)							47.0				20.7	20.7
Total Lost Time (s)							6.0				5.7	5.7
Act Effct Green (s)				50.6	50.6	50.6	10.9	25.7			8.9	8.9
Actuated g/C Ratio				0.58	0.58	0.58	0.13	0.30			0.10	0.10
v/c Ratio				0.05	0.05	0.09	0.10	0.14			0.42	0.57
Control Delay				9.8	9.8	0.2	42.3	2.5			39.4	12.8
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				9.8	9.8	0.2	42.3	2.5			39.4	12.8
LOS				A	A	A	D	A			D	B
Approach Delay					5.3			7.9			24.7	
Approach LOS					A			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 87			
Actuated Cycle Length: 87			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 34.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Spur 601 WBFR & Constitution Ave



Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

AM Existing Peak Hour
05/28/2021

Lane Group	Ø2	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	2	3	5	6	7	8
Permitted Phases						
Total Split (s)	11.0	6.5	6.5	27.0	11.8	40.0
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

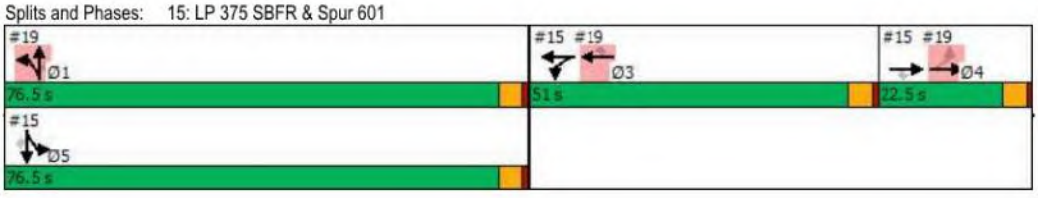
Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

AM Existing Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	95	601	129	1952	0	0	0	0	2	0	133
Future Volume (vph)	0	95	601	129	1952	0	0	0	0	2	0	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt			0.850									0.850
Flt Protected					0.997					0.950	0.950	
Satd. Flow (prot)	0	3539	1583	0	3529	0	0	0	0	1681	1681	1583
Flt Permitted					0.997					0.950	0.950	
Satd. Flow (perm)	0	3539	1583	0	3529	0	0	0	0	1681	1681	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			653									145
Link Speed (mph)		60			60			65			30	
Link Distance (ft)		943			294			303			201	
Travel Time (s)		10.7			3.3			3.2			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	103	653	140	2122	0	0	0	0	2	0	145
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	103	653	0	2262	0	0	0	0	1	1	145
Turn Type		NA	Perm	Split	NA					Split	NA	Perm
Protected Phases		4		3	3					5	5	
Permitted Phases			4									5
Total Split (s)		22.5	22.5	51.0	51.0					76.5	76.5	76.5
Total Lost Time (s)		4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)		18.0	18.0		46.5					72.0	72.0	72.0
Actuated g/C Ratio		0.12	0.12		0.31					0.48	0.48	0.48
v/c Ratio		0.24	0.85		2.07					0.00	0.00	0.17
Control Delay		61.5	16.2		509.7					20.0	20.0	3.6
Queue Delay		0.0	0.0		3.0					0.0	0.0	0.0
Total Delay		61.5	16.2		512.7					20.0	20.0	3.6
LOS		E	B		F					B	B	A
Approach Delay		22.3			512.7						3.8	
Approach LOS		C			F						A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 2.37			
Intersection Signal Delay: 371.9		Intersection LOS: F	
Intersection Capacity Utilization 110.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 15: LP 375 SBFR & Spur 601



Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

AM Existing Peak Hour
05/28/2021

Lane Group	Ø1
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	1
Permitted Phases	
Total Split (s)	76.5
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

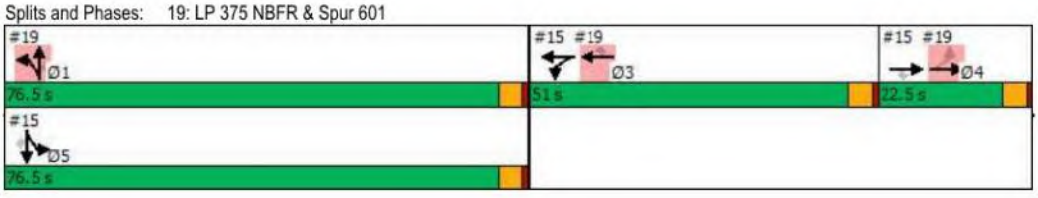
Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

AM Existing Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	19	0	0	184	20	1847	0	30	0	0	0
Future Volume (vph)	79	19	0	0	184	20	1847	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected		0.961					0.950					
Satd. Flow (prot)	0	3401	0	0	3539	1583	1770	1863	1583	0	0	0
Flt Permitted		0.674					0.950					
Satd. Flow (perm)	0	2385	0	0	3539	1583	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						44			1030			
Link Speed (mph)		60			40			65			65	
Link Distance (ft)		294			593			284			254	
Travel Time (s)		3.3			10.1			3.0			2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	21	0	0	200	22	2008	0	33	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	0	200	22	2008	0	33	0	0	0
Turn Type	Perm	NA			NA	Perm	Split		Perm			
Protected Phases		4			3		1	1				
Permitted Phases	4					3			1			
Total Split (s)	22.5	22.5			51.0	51.0	76.5	76.5	76.5			
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5	4.5			
Act Effct Green (s)		18.0			46.5	46.5	72.0		72.0			
Actuated g/C Ratio		0.12			0.31	0.31	0.48		0.48			
v/c Ratio		0.37			0.18	0.04	2.37		0.03			
Control Delay		9.7			38.4	2.3	639.6		0.0			
Queue Delay		0.0			0.1	0.0	19.4		0.0			
Total Delay		9.7			38.5	2.3	659.0		0.0			
LOS		A			D	A	F		A			
Approach Delay		9.7			34.9			648.3				
Approach LOS		A			C			F				

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 2.37			
Intersection Signal Delay: 562.1		Intersection LOS: F	
Intersection Capacity Utilization 123.0%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 19: LP 375 NBFR & Spur 601



Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

AM Existing Peak Hour
05/28/2021

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	76.5
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

Baseline
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	4	20	0	0	0	0	51	52	191	41	0
Future Volume (vph)	28	4	20	0	0	0	0	51	52	191	41	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850						0.850			
Flt Protected	0.950	0.963								0.950		
Satd. Flow (prot)	1681	1704	1583	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.963								0.950		
Satd. Flow (perm)	1681	1704	1583	0	0	0	0	3539	1583	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			178						253			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		148			245			425			300	
Travel Time (s)		2.9			4.8			9.7			6.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	30	4	22	0	0	0	0	55	57	208	45	0
Shared Lane Traffic (%)	44%											
Lane Group Flow (vph)	17	17	22	0	0	0	0	55	57	208	45	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	5 8	5 8						7		6	6 7	
Permitted Phases			5 8						7			
Total Split (s)								11.8	11.8	27.0		
Total Lost Time (s)								5.8	5.8	6.0		
Act Effct Green (s)	13.9	13.9	13.9					6.3	6.3	49.5	61.6	
Actuated g/C Ratio	0.16	0.16	0.16					0.07	0.07	0.57	0.71	
v/c Ratio	0.06	0.06	0.05					0.21	0.16	0.21	0.02	
Control Delay	31.6	31.6	0.2					39.9	1.0	4.3	0.3	
Queue Delay	0.0	0.0	0.0					0.0	0.0	2.1	0.0	
Total Delay	31.6	31.6	0.2					39.9	1.0	6.4	0.3	
LOS	C	C	A					D	A	A	A	
Approach Delay		19.3						20.1			5.3	
Approach LOS		B						C			A	

Intersection Summary	
Area Type:	Other

PM Existing Peak Hour 05/25/2021 Baseline

Synchro 10 Report
Page 1

Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

Baseline
05/28/2021

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Width (ft)						
Grade (%)						
Storage Length (ft)						
Storage Lanes						
Taper Length (ft)						
Lane Util. Factor						
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor						
Growth Factor						
Heavy Vehicles (%)						
Bus Blockages (#/hr)						
Parking (#/hr)						
Mid-Block Traffic (%)						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	1	2	3	4	5	8
Permitted Phases						
Total Split (s)	20.7	11.0	6.5	47.0	6.5	40.0
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

PM Existing Peak Hour 05/25/2021 Baseline

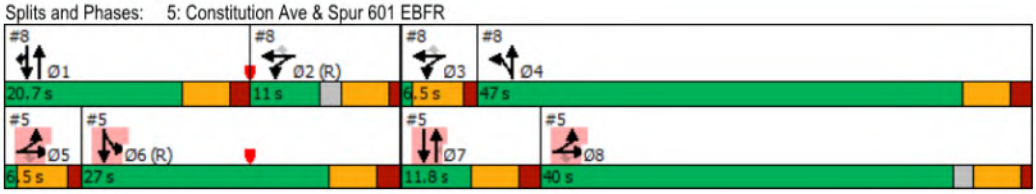
Synchro 10 Report
Page 2

Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

Baseline
05/28/2021

Cycle Length: 87	
Actuated Cycle Length: 87	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 37.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Constitution Ave & Spur 601 EBFR



Lanes, Volumes, Timings
8: Constitution Ave & Spur 601 WBFR

Baseline
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	14	1	14	43	36	0	0	219	211
Future Volume (vph)	0	0	0	14	1	14	43	36	0	0	219	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt						0.850						0.850
Flt Protected				0.950	0.958		0.950					
Satd. Flow (prot)	0	0	0	1681	1695	1583	1770	3539	0	0	3539	1583
Flt Permitted				0.950	0.958		0.950					
Satd. Flow (perm)	0	0	0	1681	1695	1583	1770	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						178						229
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		139			242			300			606	
Travel Time (s)		2.7			4.7			6.8			13.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	0	15	1	15	47	39	0	0	238	229
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	0	0	8	8	15	47	39	0	0	238	229
Turn Type				Split	NA	Perm	Prot	NA			NA	Prot
Protected Phases				2 3	2 3		4	1 4			1	1
Permitted Phases						2 3						
Total Split (s)							47.0				20.7	20.7
Total Lost Time (s)							6.0				5.7	5.7
Act Effct Green (s)				50.5	50.5	50.5	9.1	25.8			10.7	10.7
Actuated g/C Ratio				0.58	0.58	0.58	0.10	0.30			0.12	0.12
v/c Ratio				0.01	0.01	0.02	0.26	0.04			0.55	0.58
Control Delay				9.4	9.4	0.0	32.2	0.8			40.1	11.1
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				9.4	9.4	0.0	32.2	0.8			40.1	11.1
LOS				A	A	A	C	A			D	B
Approach Delay					4.9			18.0			25.9	
Approach LOS					A			B			C	

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
8: Constitution Ave & Spur 601 WBFR

Baseline
05/28/2021

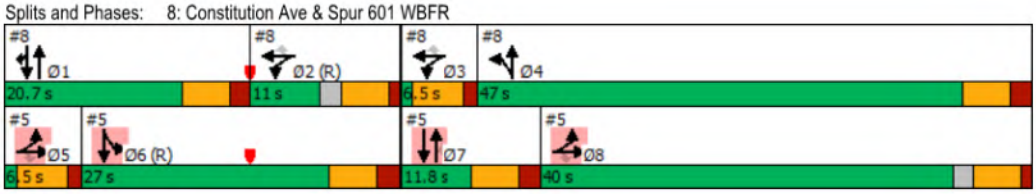
Lane Group	Ø2	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Width (ft)						
Grade (%)						
Storage Length (ft)						
Storage Lanes						
Taper Length (ft)						
Lane Util. Factor						
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor						
Growth Factor						
Heavy Vehicles (%)						
Bus Blockages (#/hr)						
Parking (#/hr)						
Mid-Block Traffic (%)						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	2	3	5	6	7	8
Permitted Phases						
Total Split (s)	11.0	6.5	6.5	27.0	11.8	40.0
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						
Intersection Summary						

Lanes, Volumes, Timings
8: Constitution Ave & Spur 601 WBFR

Baseline
05/28/2021

Cycle Length: 87	
Actuated Cycle Length: 87	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 37.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Constitution Ave & Spur 601 WBFR



Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

Baseline
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	100	1816	272	765	0	0	0	0	0	0	128
Future Volume (vph)	0	100	1816	272	765	0	0	0	0	0	0	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected					0.987							
Satd. Flow (prot)	0	3539	1583	0	3493	0	0	0	0	1770	1770	1583
Flt Permitted					0.987							
Satd. Flow (perm)	0	3539	1583	0	3493	0	0	0	0	1770	1770	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			632									659
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		943			294			303			201	
Travel Time (s)		18.4			5.7			5.9			3.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	109	1974	296	832	0	0	0	0	0	0	139
Shared Lane Traffic (%)										0%		
Lane Group Flow (vph)	0	109	1974	0	1128	0	0	0	0	0	0	139
Turn Type		NA	Perm	Split	NA					Split		Perm
Protected Phases		4		1 3!	1 3!					5!	5!	
Permitted Phases			4									5
Total Split (s)		36.0	36.0							66.3	66.3	66.3
Total Lost Time (s)		6.0	6.0							6.3	6.3	6.3
Act Effct Green (s)		37.4	37.4		88.6							54.9
Actuated g/C Ratio		0.27	0.27		0.64							0.40
v/c Ratio		0.11	2.22		0.50							0.14
Control Delay		41.4	570.6		1.7							0.3
Queue Delay		0.0	0.0		0.8							0.0
Total Delay		41.4	570.6		2.6							0.3
LOS		D	F		A							A
Approach Delay		542.9			2.6						0.3	
Approach LOS		F			A						A	

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

Baseline
05/28/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Growth Factor		
Heavy Vehicles (%)		
Bus Blockages (#/hr)		
Parking (#/hr)		
Mid-Block Traffic (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Total Split (s)	66.3	36.0
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

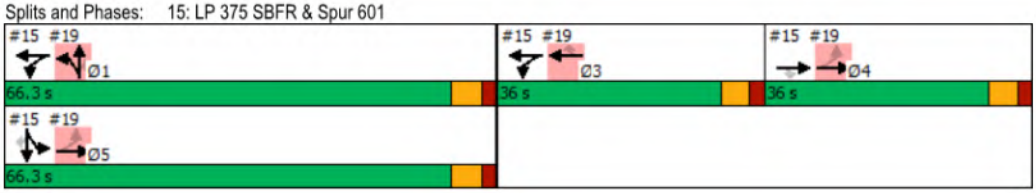
Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

Baseline
05/28/2021

Cycle Length: 138.3	
Actuated Cycle Length: 138.3	
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.22	
Intersection Signal Delay: 338.5	Intersection LOS: F
Intersection Capacity Utilization 151.7%	ICU Level of Service H
Analysis Period (min) 15	

! Phase conflict between lane groups.

Splits and Phases: 15: LP 375 SBFR & Spur 601



Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

Baseline
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	1	0	0	463	67	561	0	1	0	0	0
Future Volume (vph)	101	1	0	0	463	67	561	0	1	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected		0.953					0.950					
Satd. Flow (prot)	0	3373	0	0	3539	1583	1770	1863	1583	0	0	0
Flt Permitted		0.561					0.950					
Satd. Flow (perm)	0	1985	0	0	3539	1583	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						73			1090			
Link Speed (mph)		35			40			35			35	
Link Distance (ft)		294			598			284			254	
Travel Time (s)		5.7			10.2			5.5			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	110	1	0	0	503	73	610	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	111	0	0	503	73	610	0	1	0	0	0
Turn Type	Perm	NA			NA	Perm	Split		Perm			
Protected Phases		4 5!			3		1!	1!				
Permitted Phases	4 5!					3			1			
Total Split (s)					36.0	36.0	66.3	66.3	66.3			
Total Lost Time (s)					6.0	6.0	6.3	6.3	6.3			
Act Effct Green (s)		98.6			27.7	27.7	54.9		54.9			
Actuated g/C Ratio		0.71			0.20	0.20	0.40		0.40			
v/c Ratio		0.08			0.71	0.19	0.87		0.00			
Control Delay		1.5			57.3	10.6	52.0		0.0			
Queue Delay		0.0			0.0	0.0	0.0		0.0			
Total Delay		1.5			57.3	10.6	52.0		0.0			
LOS		A			E	B	D		A			
Approach Delay		1.5			51.4			52.0				
Approach LOS		A			D			D				

Intersection Summary	
Area Type:	Other

PM Existing Peak Hour 05/25/2021 Baseline

Synchro 10 Report
Page 10

Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

Baseline
05/28/2021

Lane Group	Ø4	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Growth Factor		
Heavy Vehicles (%)		
Bus Blockages (#/hr)		
Parking (#/hr)		
Mid-Block Traffic (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	5
Permitted Phases		
Total Split (s)	36.0	66.3
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

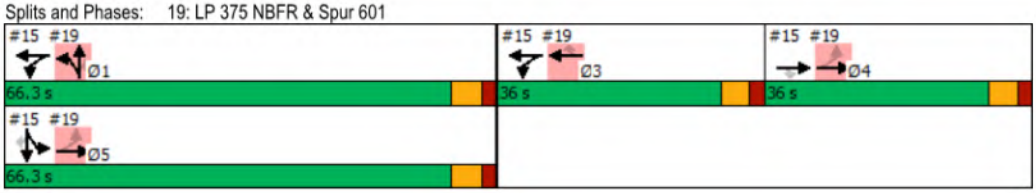
Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

Baseline
05/28/2021

Cycle Length: 138.3	
Actuated Cycle Length: 138.3	
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.22	
Intersection Signal Delay: 47.4	Intersection LOS: D
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

! Phase conflict between lane groups.

Splits and Phases: 19: LP 375 NBFR & Spur 601



HCM 6th TWSC
34: Iron Medics Dr & LP 375 N

AM Existing Peak Hour
05/27/2021

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	2	2	2	0
Future Vol, veh/h	0	0	2	2	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2	2	2	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	0	0	6	-
Stage 1	-	-	0	-
Stage 2	-	-	6	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	1015	0
Stage 1	-	-	-	0
Stage 2	-	-	1017	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	1015	-
Mov Cap-2 Maneuver	-	-	1015	-
Stage 1	-	-	-	-
Stage 2	-	-	1017	-

Approach	WB	NB
HCM Control Delay, s		8.6
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	1015	-	-
HCM Lane V/C Ratio	0.002	-	-
HCM Control Delay (s)	8.6	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

HCM 6th TWSC
36: Iron Medics Dr & Loop 375 S

AM Existing Peak Hour
05/27/2021

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰							↱		↰	
Traffic Vol, veh/h	2	1	0	0	0	0	0	0	0	2	0	0
Future Vol, veh/h	2	1	0	0	0	0	0	0	0	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	16979	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	0	0	0	0	0	0	0	2	0	0

Major/Minor	Minor2			Major2		
Conflicting Flow All	4	4	-	0	0	0
Stage 1	4	4	-	-	-	-
Stage 2	0	0	-	-	-	-
Critical Hdwy	6.42	6.52	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	-	2.218	-	-
Pot Cap-1 Maneuver	1018	891	0	-	-	0
Stage 1	1019	892	0	-	-	0
Stage 2	-	-	0	-	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	1018	0	-	-	-	-
Mov Cap-2 Maneuver	1018	0	-	-	-	-
Stage 1	1019	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	8.5	
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	SBL	SBT
Capacity (veh/h)	1018	-	-
HCM Lane V/C Ratio	0.003	-	-
HCM Control Delay (s)	8.5	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

HCM 6th AWSC
45: Iron Dustoff Dr & Constitution Ave

AM Existing Peak Hour
05/27/2021

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	36	6	170	1	1	3	14	1	0	0	2	33
Future Vol, veh/h	36	6	170	1	1	3	14	1	0	0	2	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	39	7	185	1	1	3	15	1	0	0	2	36
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	7.8	7.2	8.4	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	98%	0%	92%	0%	67%	0%	0%	0%
Vol Thru, %	2%	100%	8%	2%	33%	14%	100%	2%
Vol Right, %	0%	0%	0%	98%	0%	86%	0%	98%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	1	39	173	2	4	1	34
LT Vol	14	0	36	0	1	0	0	0
Through Vol	0	1	3	3	1	1	1	1
RT Vol	0	0	0	170	0	3	0	33
Lane Flow Rate	16	1	42	188	2	4	1	37
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.024	0.001	0.06	0.206	0.002	0.004	0.002	0.044
Departure Headway (Hd)	5.566	5.076	5.092	3.942	5.081	4.146	5.061	4.373
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	647	709	702	906	697	851	711	824
Service Time	3.266	2.776	2.835	1.685	2.865	1.929	2.761	2.073
HCM Lane V/C Ratio	0.025	0.001	0.06	0.208	0.003	0.005	0.001	0.045
HCM Control Delay	8.4	7.8	8.2	7.7	7.9	6.9	7.8	7.3
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.2	0.8	0	0	0	0.1

HCM 6th TWSC
34: Iron Medics Dr & Loop 375 N

Baseline
05/28/2021

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	4	3	5	0
Future Vol, veh/h	0	0	4	3	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	4	3	5	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	0	0	11	-
Stage 1	-	-	0	-
Stage 2	-	-	11	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	1009	0
Stage 1	-	-	-	0
Stage 2	-	-	1012	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	1009	-
Mov Cap-2 Maneuver	-	-	1009	-
Stage 1	-	-	-	-
Stage 2	-	-	1012	-

Approach	WB	NB
HCM Control Delay, s		8.6
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	1009	-	-
HCM Lane V/C Ratio	0.005	-	-
HCM Control Delay (s)	8.6	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

PM Existing Peak Hour 05/25/2021 Baseline

Synchro 10 Report
Page 1

HCM 6th TWSC
36: Iron Medics Dr & Loop 375 S

Baseline
05/28/2021

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	45	0	0	0	0	0	0	0	4	0	0
Future Vol, veh/h	6	45	0	0	0	0	0	0	0	4	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	49	0	0	0	0	0	0	0	4	0	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	8	8	-	-	0	0	0	0	0
Stage 1	8	8	-	-	-	-	-	-	-
Stage 2	0	0	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	-	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	-	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	1013	887	0	0	-	-	-	-	0
Stage 1	1015	889	0	0	-	-	-	-	0
Stage 2	-	-	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	1013	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	1013	0	-	-	-	-	-	-	-
Stage 1	1015	0	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	1013	-	-
HCM Lane V/C Ratio	-	-	0.055	-	-
HCM Control Delay (s)	-	-	8.8	-	-
HCM Lane LOS	-	-	A	-	-
HCM 95th %tile Q(veh)	-	-	0.2	-	-

HCM 6th AWSC
45: Iron Dustoff Dr & Constitution Ave

Baseline
05/28/2021

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱			↰↑↱			↰↑↱	
Traffic Vol, veh/h	38	0	17	0	2	1	57	1	0	0	0	36
Future Vol, veh/h	38	0	17	0	2	1	57	1	0	0	0	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	0	18	0	2	1	62	1	0	0	0	39
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	7.9	7.3	8.4	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	99%	0%	100%	0%	0%	0%	0%	0%
Vol Thru, %	1%	100%	0%	0%	100%	40%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	60%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	1	38	17	1	2	0	36
LT Vol	57	0	38	0	0	0	0	0
Through Vol	0	1	0	0	1	1	0	0
RT Vol	0	0	0	17	0	1	0	36
Lane Flow Rate	62	1	41	18	1	2	0	39
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.089	0.001	0.06	0.021	0.002	0.002	0	0.043
Departure Headway (Hd)	5.158	4.661	5.213	4.011	4.843	4.322	4.673	3.972
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	691	763	681	880	743	814	0	890
Service Time	2.918	2.421	2.995	1.793	2.543	2.122	2.449	1.748
HCM Lane V/C Ratio	0.09	0.001	0.06	0.02	0.001	0.002	0	0.044
HCM Control Delay	8.4	7.4	8.3	6.9	7.6	7.1	7.4	6.9
HCM Lane LOS	A	A	A	A	A	A	N	A
HCM 95th-tile Q	0.3	0	0.2	0.1	0	0	0	0.1

HCM 6th AWSC
48: Iron Medics Dr & Iron Dustoff Dr

Baseline
05/28/2021

Intersection	
Intersection Delay, s/veh	0
Intersection LOS	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0
Number of Lanes	0	2	2	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	0	0	0
HCM LOS	-	-	-

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	0%	0%	0%	0%
Vol Thru, %	100%	100%	100%	100%	100%	100%
Vol Right, %	0%	0%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	0	0	0	0
LT Vol	0	0	0	0	0	0
Through Vol	0	0	0	0	0	0
RT Vol	0	0	0	0	0	0
Lane Flow Rate	0	0	0	0	0	0
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0	0	0	0	0	0
Departure Headway (Hd)	4.534	2.8	4.534	2.8	4.534	2.8
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	0	0	0	0	0
Service Time	2.234	0.5	2.234	0.5	2.234	0.5
HCM Lane V/C Ratio	0	0	0	0	0	0
HCM Control Delay	7.2	5.5	7.2	5.5	7.2	5.5
HCM Lane LOS	N	N	N	N	N	N
HCM 95th-tile Q	0	0	0	0	0	0

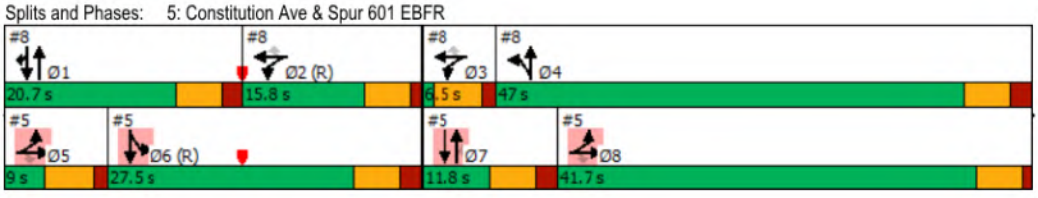
Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

AM Build Out Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	1	142	0	0	0	0	59	21	134	135	0
Future Volume (vph)	144	1	142	0	0	0	0	59	21	134	135	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.953								0.950		
Satd. Flow (prot)	1681	1686	1583	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.953								0.950		
Satd. Flow (perm)	1681	1686	1583	0	0	0	0	3539	1583	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			172						245			
Link Speed (mph)		30			35			35			30	
Link Distance (ft)		148			245			425			300	
Travel Time (s)		3.4			4.8			8.3			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	1	154	0	0	0	0	64	23	146	147	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	78	80	154	0	0	0	0	64	23	146	147	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	5 8	5 8						7		6	6 7	
Permitted Phases			5 8						7			
Total Split (s)								11.8	11.8	27.5		
Total Lost Time (s)								5.8	5.8	6.0		
Act Effct Green (s)	16.4	16.4	16.4					6.5	6.5	49.8	62.1	
Actuated g/C Ratio	0.18	0.18	0.18					0.07	0.07	0.55	0.69	
v/c Ratio	0.26	0.26	0.36					0.25	0.07	0.15	0.06	
Control Delay	33.0	33.1	6.4					41.8	0.4	4.4	1.1	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	33.0	33.1	6.4					41.8	0.4	4.4	1.1	
LOS	C	C	A					D	A	A	A	
Approach Delay		19.9						30.8			2.8	
Approach LOS		B						C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 36.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Constitution Ave & Spur 601 EBFR



Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

AM Build Out Peak Hour
05/28/2021

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	1	2	3	4	5	8
Permitted Phases						
Total Split (s)	20.7	15.8	6.5	47.0	9.0	41.7
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

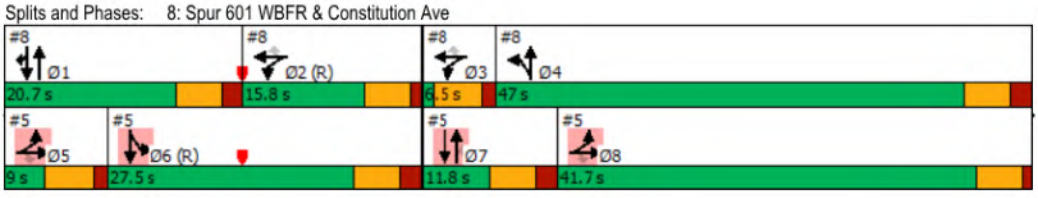
Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

AM Build Out Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	100	1	90	39	155	0	0	159	196
Future Volume (vph)	0	0	0	100	1	90	39	155	0	0	159	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1681	1686	1583	1770	3539	0	0	3539	1583
Flt Permitted				0.950	0.953		0.950					
Satd. Flow (perm)	0	0	0	1681	1686	1583	1770	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						172						213
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		139			242			300			606	
Travel Time (s)		3.2			5.5			6.8			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	109	1	98	42	168	0	0	173	213
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	54	56	98	42	168	0	0	173	213
Turn Type				Split	NA	Perm	Prot	NA			NA	Prot
Protected Phases				2 3	2 3		4	1 4			1	1
Permitted Phases						2 3						
Total Split (s)							47.0				20.7	20.7
Total Lost Time (s)							6.0				5.7	5.7
Act Effct Green (s)				52.4	52.4	52.4	11.4	26.9			9.5	9.5
Actuated g/C Ratio				0.58	0.58	0.58	0.13	0.30			0.11	0.11
v/c Ratio				0.06	0.06	0.10	0.19	0.16			0.47	0.60
Control Delay				10.2	10.2	0.3	38.9	1.7			41.3	12.7
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				10.2	10.2	0.3	38.9	1.7			41.3	12.7
LOS				B	B	A	D	A			D	B
Approach Delay					5.6			9.1			25.5	
Approach LOS					A			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 36.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Spur 601 WBFR & Constitution Ave



Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

AM Build Out Peak Hour
05/28/2021

Lane Group	Ø2	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	2	3	5	6	7	8
Permitted Phases						
Total Split (s)	15.8	6.5	9.0	27.5	11.8	41.7
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

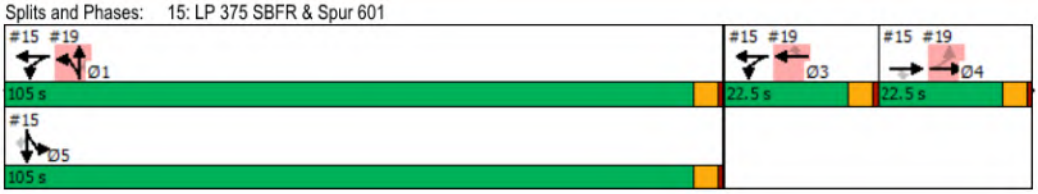
Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

AM Build Out Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	109	691	198	2242	0	0	0	0	2	33	153
Future Volume (vph)	0	109	691	198	2242	0	0	0	0	2	33	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt			0.850									0.850
Flt Protected					0.996					0.950		
Satd. Flow (prot)	0	3539	1583	0	3525	0	0	0	0	1681	1770	1583
Flt Permitted					0.996					0.950		
Satd. Flow (perm)	0	3539	1583	0	3525	0	0	0	0	1681	1770	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			737									166
Link Speed (mph)		60			60			65			30	
Link Distance (ft)		943			294			303			201	
Travel Time (s)		10.7			3.3			3.2			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	118	751	215	2437	0	0	0	0	2	36	166
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	118	751	0	2652	0	0	0	0	2	36	166
Turn Type		NA	Perm	Split	NA					Split	NA	Perm
Protected Phases		4		1 3!	1 3!					5!	5!	
Permitted Phases			4									5
Total Split (s)		22.5	22.5							105.0	105.0	105.0
Total Lost Time (s)		4.5	4.5							4.5	4.5	4.5
Act Effct Green (s)		18.0	18.0		123.0					100.5	100.5	100.5
Actuated g/C Ratio		0.12	0.12		0.82					0.67	0.67	0.67
v/c Ratio		0.28	0.90		0.92					0.00	0.03	0.15
Control Delay		62.0	19.0		2.6					8.0	8.5	1.5
Queue Delay		0.0	0.0		46.1					0.0	0.0	0.0
Total Delay		62.0	19.0		48.7					8.0	8.5	1.5
LOS		E	B		D					A	A	A
Approach Delay		24.8			48.7						2.8	
Approach LOS		C			D						A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 1.95			
Intersection Signal Delay: 40.6		Intersection LOS: D	
Intersection Capacity Utilization 125.9%		ICU Level of Service H	
Analysis Period (min) 15			
! Phase conflict between lane groups.			

Splits and Phases: 15: LP 375 SBFR & Spur 601



Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

AM Build Out Peak Hour
05/28/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Total Split (s)	105.0	22.5
Total Lost Time (s)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

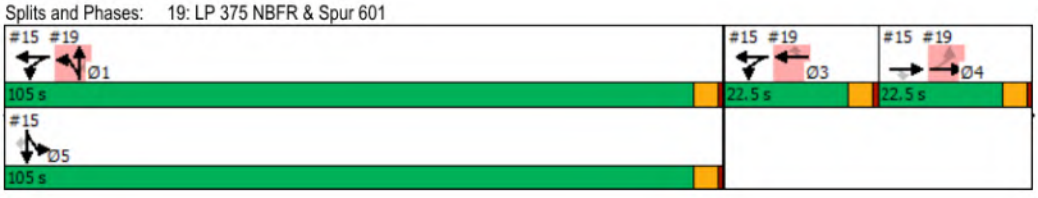
Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

AM Build Out Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	21	0	0	261	22	2122	8	59	0	0	0
Future Volume (vph)	91	21	0	0	261	22	2122	8	59	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected		0.961					0.950					
Satd. Flow (prot)	0	3401	0	0	3539	1583	1770	1863	1583	0	0	0
Flt Permitted		0.644					0.950					
Satd. Flow (perm)	0	2279	0	0	3539	1583	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						44			64			
Link Speed (mph)		60			40			65			65	
Link Distance (ft)		294			593			284			254	
Travel Time (s)		3.3			10.1			3.0			2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	23	0	0	284	24	2307	9	64	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	0	284	24	2307	9	64	0	0	0
Turn Type	Perm	NA			NA	Perm	Split	NA	Perm			
Protected Phases		4			3		1	1				
Permitted Phases	4					3			1			
Total Split (s)	22.5	22.5			22.5	22.5	105.0	105.0	105.0			
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5	4.5			
Act Effct Green (s)		18.0			18.0	18.0	100.5	100.5	100.5			
Actuated g/C Ratio		0.12			0.12	0.12	0.67	0.67	0.67			
v/c Ratio		0.45			0.67	0.11	1.95	0.01	0.06			
Control Delay		11.6			71.7	6.0	450.7	8.2	2.0			
Queue Delay		0.0			1.8	0.0	0.0	0.0	0.0			
Total Delay		11.6			73.5	6.0	450.7	8.2	2.0			
LOS		B			E	A	F	A	A			
Approach Delay		11.6			68.3			436.9				
Approach LOS		B			E			F				

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 1.95			
Intersection Signal Delay: 378.1		Intersection LOS: F	
Intersection Capacity Utilization 141.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 19: LP 375 NBFR & Spur 601



Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

AM Build Out Peak Hour
05/28/2021

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	105.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

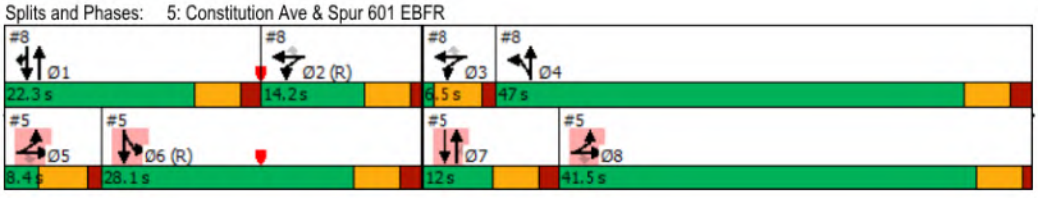
Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

PM Build Out Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	5	55	0	0	0	0	74	68	220	47	0
Future Volume (vph)	33	5	55	0	0	0	0	74	68	220	47	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.964								0.950		
Satd. Flow (prot)	1681	1706	1583	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.964								0.950		
Satd. Flow (perm)	1681	1706	1583	0	0	0	0	3539	1583	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			172						245			
Link Speed (mph)		30			35			35			30	
Link Distance (ft)		148			245			425			300	
Travel Time (s)		3.4			4.8			8.3			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	5	60	0	0	0	0	80	74	239	51	0
Shared Lane Traffic (%)	43%											
Lane Group Flow (vph)	21	20	60	0	0	0	0	80	74	239	51	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	5 8	5 8						7		6	6 7	
Permitted Phases			5 8						7			
Total Split (s)								12.0	12.0	28.1		
Total Lost Time (s)								5.8	5.8	6.0		
Act Effct Green (s)	14.0	14.0	14.0					6.8	6.8	51.9	64.5	
Actuated g/C Ratio	0.16	0.16	0.16					0.08	0.08	0.58	0.72	
v/c Ratio	0.08	0.08	0.15					0.30	0.21	0.23	0.02	
Control Delay	33.2	33.1	0.8					42.1	1.4	4.7	0.2	
Queue Delay	0.0	0.0	0.0					0.0	0.0	3.4	0.0	
Total Delay	33.2	33.1	0.8					42.1	1.4	8.1	0.2	
LOS	C	C	A					D	A	A	A	
Approach Delay		14.0						22.5			6.7	
Approach LOS		B						C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 12.5		Intersection LOS: B	
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Constitution Ave & Spur 601 EBFR



Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

PM Build Out Peak Hour
05/28/2021

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	1	2	3	4	5	8
Permitted Phases						
Total Split (s)	22.3	14.2	6.5	47.0	8.4	41.5
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

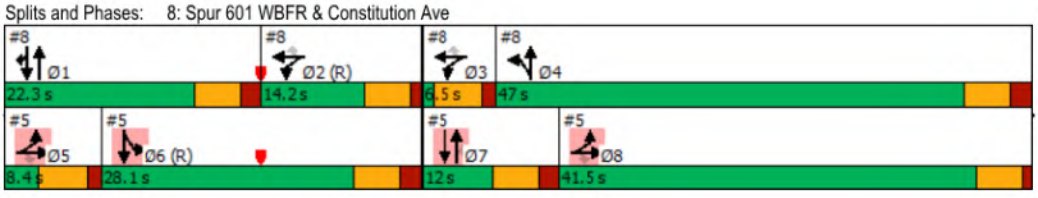
Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

PM Build Out Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	15	1	15	65	42	0	0	252	243
Future Volume (vph)	0	0	0	15	1	15	65	42	0	0	252	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950	0.957		0.950					
Satd. Flow (prot)	0	0	0	1681	1694	1583	1770	3539	0	0	3539	1583
Flt Permitted				0.950	0.957		0.950					
Satd. Flow (perm)	0	0	0	1681	1694	1583	1770	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						172						264
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		139			242			300			606	
Travel Time (s)		3.2			5.5			6.8			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	16	1	16	71	46	0	0	274	264
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	0	0	8	9	16	71	46	0	0	274	264
Turn Type				Split	NA	Perm	Prot	NA			NA	Prot
Protected Phases				2 3	2 3		4	1 4			1	1
Permitted Phases						2 3						
Total Split (s)							47.0				22.3	22.3
Total Lost Time (s)							6.0				5.7	5.7
Act Effct Green (s)				51.7	51.7	51.7	9.6	27.6			12.0	12.0
Actuated g/C Ratio				0.57	0.57	0.57	0.11	0.31			0.13	0.13
v/c Ratio				0.01	0.01	0.02	0.38	0.04			0.58	0.60
Control Delay				10.3	10.2	0.0	32.3	0.7			41.2	10.7
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.1	0.0
Total Delay				10.3	10.2	0.0	32.3	0.7			41.3	10.7
LOS				B	B	A	C	A			D	B
Approach Delay					5.3			19.9			26.3	
Approach LOS					A			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 24.2		Intersection LOS: C	
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Spur 601 WBFR & Constitution Ave



Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

PM Build Out Peak Hour
05/28/2021

Lane Group	Ø2	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	2	3	5	6	7	8
Permitted Phases						
Total Split (s)	14.2	6.5	8.4	28.1	12.0	41.5
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

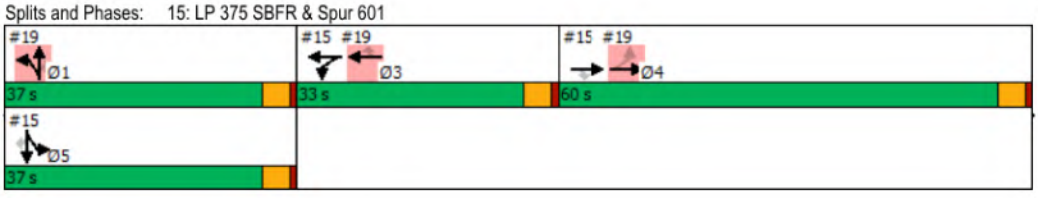
Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

PM Build Out Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	114	2086	363	879	0	0	0	0	0	33	147
Future Volume (vph)	0	114	2086	363	879	0	0	0	0	0	33	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt			0.850									0.850
Flt Protected					0.986							
Satd. Flow (prot)	0	3539	1583	0	3490	0	0	0	0	1770	1770	1583
Flt Permitted					0.986							
Satd. Flow (perm)	0	3539	1583	0	3490	0	0	0	0	1770	1770	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			531									160
Link Speed (mph)		60			60			65			30	
Link Distance (ft)		943			294			303			201	
Travel Time (s)		10.7			3.3			3.2			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	124	2267	395	955	0	0	0	0	0	36	160
Shared Lane Traffic (%)										0%		
Lane Group Flow (vph)	0	124	2267	0	1350	0	0	0	0	0	36	160
Turn Type		NA	Perm	Split	NA					Split	NA	Perm
Protected Phases		4		3	3					5	5	
Permitted Phases			4									5
Total Split (s)		60.0	60.0	33.0	33.0					37.0	37.0	37.0
Total Lost Time (s)		4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)		55.5	55.5		28.5						32.5	32.5
Actuated g/C Ratio		0.43	0.43		0.22						0.25	0.25
v/c Ratio		0.08	2.31		1.76						0.08	0.31
Control Delay		22.4	612.1		365.6						38.1	7.3
Queue Delay		0.0	0.0		0.0						0.0	0.0
Total Delay		22.4	612.1		365.6						38.1	7.3
LOS		C	F		F						D	A
Approach Delay		581.5			365.6						13.0	
Approach LOS		F			F						B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 2.31			
Intersection Signal Delay: 479.2		Intersection LOS: F	
Intersection Capacity Utilization 179.4%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 15: LP 375 SBFR & Spur 601



Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

PM Build Out Peak Hour
05/28/2021

Lane Group	Ø1
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	1
Permitted Phases	
Total Split (s)	37.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

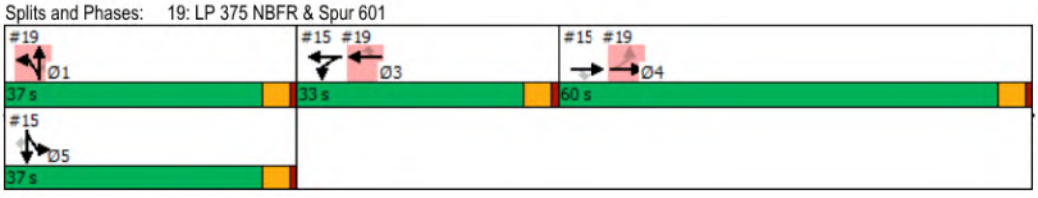
Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

PM Build Out Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	1	0	0	581	77	644	8	25	0	0	0
Future Volume (vph)	116	1	0	0	581	77	644	8	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected		0.953					0.950					
Satd. Flow (prot)	0	3373	0	0	3539	1583	1770	1863	1583	0	0	0
Flt Permitted		0.532					0.950					
Satd. Flow (perm)	0	1883	0	0	3539	1583	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						84			50			
Link Speed (mph)		60			40			65			65	
Link Distance (ft)		294			593			284			254	
Travel Time (s)		3.3			10.1			3.0			2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	1	0	0	632	84	700	9	27	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	0	0	632	84	700	9	27	0	0	0
Turn Type	Perm	NA			NA	Perm	Split	NA	Perm			
Protected Phases		4			3		1	1				
Permitted Phases	4					3			1			
Total Split (s)	60.0	60.0			33.0	33.0	37.0	37.0	37.0			
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5	4.5			
Act Effct Green (s)		55.5			28.5	28.5	32.5	32.5	32.5			
Actuated g/C Ratio		0.43			0.22	0.22	0.25	0.25	0.25			
v/c Ratio		0.16			0.82	0.20	1.58	0.02	0.06			
Control Delay		3.6			57.8	9.6	306.7	37.0	3.4			
Queue Delay		0.0			53.4	0.0	7.2	0.0	0.0			
Total Delay		3.6			111.3	9.6	313.9	37.0	3.4			
LOS		A			F	A	F	D	A			
Approach Delay		3.6			99.3			299.1				
Approach LOS		A			F			F				

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 2.31			
Intersection Signal Delay: 184.8		Intersection LOS: F	
Intersection Capacity Utilization 69.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 19: LP 375 NBFR & Spur 601



Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

PM Build Out Peak Hour
05/28/2021

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	37.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

HCM 6th TWSC
34: Iron Medics Dr & LP 375 N

AM Build Out Peak Hour
05/28/2021

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	219	2	34	0
Future Vol, veh/h	0	0	219	2	34	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	238	2	37	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	0	0	478	-
Stage 1	-	-	0	-
Stage 2	-	-	478	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	546	0
Stage 1	-	-	-	0
Stage 2	-	-	624	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	546	-
Mov Cap-2 Maneuver	-	-	546	-
Stage 1	-	-	-	-
Stage 2	-	-	624	-

Approach	WB	NB
HCM Control Delay, s		12.1
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	546	-	-
HCM Lane V/C Ratio	0.068	-	-
HCM Control Delay (s)	12.1	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-

HCM 6th TWSC
36: Iron Medics Dr & Loop 375 S

AM Build Out Peak Hour
05/28/2021

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	83	0	0	0	0	32	101	2	217	0
Future Vol, veh/h	2	1	83	0	0	0	0	32	101	2	217	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	90	0	0	0	0	35	110	2	236	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	330	385	236	-	0	0	145	0	0
Stage 1	240	240	-	-	-	-	-	-	-
Stage 2	90	145	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	665	549	803	0	-	-	1437	-	0
Stage 1	800	707	-	0	-	-	-	-	0
Stage 2	934	777	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	664	0	803	-	-	-	1437	-	-
Mov Cap-2 Maneuver	664	0	-	-	-	-	-	-	-
Stage 1	800	0	-	-	-	-	-	-	-
Stage 2	932	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	799	1437	-
HCM Lane V/C Ratio	-	-	0.117	0.002	-
HCM Control Delay (s)	-	-	10.1	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

HCM 6th AWSC
45: Iron Dustoff Dr & Constitution Ave

AM Build Out Peak Hour
05/28/2021

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	42	40	195	1	25	4	15	1	0	0	2	38
Future Vol, veh/h	42	40	195	1	25	4	15	1	0	0	2	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	46	43	212	1	27	4	16	1	0	0	2	41
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.2	7.7	8.7	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	98%	0%	68%	0%	7%	0%	0%	0%
Vol Thru, %	2%	100%	32%	9%	93%	76%	100%	2%
Vol Right, %	0%	0%	0%	91%	0%	24%	0%	98%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	1	62	215	14	17	1	39
LT Vol	15	0	42	0	1	0	0	0
Through Vol	0	1	20	20	13	13	1	1
RT Vol	0	0	0	195	0	4	0	38
Lane Flow Rate	17	1	67	234	15	18	1	42
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.027	0.001	0.093	0.261	0.02	0.024	0.002	0.054
Departure Headway (Hd)	5.796	5.304	4.993	4.019	4.944	4.737	5.283	4.592
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	621	678	712	886	727	759	681	784
Service Time	3.5	3.008	2.76	1.785	2.653	2.445	2.986	2.295
HCM Lane V/C Ratio	0.027	0.001	0.094	0.264	0.021	0.024	0.001	0.054
HCM Control Delay	8.7	8	8.3	8.2	7.8	7.6	8	7.6
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.3	1	0.1	0.1	0	0.2

HCM 6th AWSC
48: Iron Medics Dr & Iron Dustoff Dr

AM Opening Year Peak Hour
07/15/2021

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	19	0	0	0	204
Future Vol, veh/h	0	19	0	0	0	204
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	0	0	0	222
Number of Lanes	0	2	2	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	6.1	0	6.9
HCM LOS	A	-	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	0%	0%	0%	0%
Vol Thru, %	100%	100%	0%	0%	100%	100%
Vol Right, %	0%	0%	100%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	10	10	102	102
LT Vol	0	0	0	0	0	0
Through Vol	0	0	0	0	102	102
RT Vol	0	0	10	10	0	0
Lane Flow Rate	0	0	10	10	111	111
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0	0	0.012	0.007	0.141	0.087
Departure Headway (Hd)	4.682	2.945	4.207	2.468	4.569	2.835
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	0	845	1427	789	1271
Service Time	2.402	0.665	1.962	0.223	2.271	0.536
HCM Lane V/C Ratio	0	0	0.012	0.007	0.141	0.087
HCM Control Delay	7.4	5.7	7	5.2	8	5.8
HCM Lane LOS	N	N	A	A	A	A
HCM 95th-tile Q	0	0	0	0	0.5	0.3

HCM 6th TWSC
34: Iron Medics Dr & LP 375 N

PM Build Out Peak Hour
05/28/2021

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	222	4	38	0
Future Vol, veh/h	0	0	222	4	38	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	241	4	41	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	0	0	486	-
Stage 1	-	-	0	-
Stage 2	-	-	486	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	540	0
Stage 1	-	-	-	0
Stage 2	-	-	618	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	540	-
Mov Cap-2 Maneuver	-	-	540	-
Stage 1	-	-	-	-
Stage 2	-	-	618	-

Approach	WB	NB
HCM Control Delay, s		12.2
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	540	-	-
HCM Lane V/C Ratio	0.076	-	-
HCM Control Delay (s)	12.2	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-

HCM 6th TWSC
36: Iron Medics Dr & Loop 375 S

PM Build Out Peak Hour
05/28/2021

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	51	83	0	0	0	0	32	101	5	217	0
Future Vol, veh/h	7	51	83	0	0	0	0	32	101	5	217	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	55	90	0	0	0	0	35	110	5	236	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	336	391	236	-	0	0	145	0	0
Stage 1	246	246	-	-	-	-	-	-	-
Stage 2	90	145	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	659	545	803	0	-	-	1437	-	0
Stage 1	795	703	-	0	-	-	-	-	0
Stage 2	934	777	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	656	0	803	-	-	-	1437	-	-
Mov Cap-2 Maneuver	656	0	-	-	-	-	-	-	-
Stage 1	795	0	-	-	-	-	-	-	-
Stage 2	930	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	789	1437	-
HCM Lane V/C Ratio	-	-	0.194	0.004	-
HCM Control Delay (s)	-	-	10.7	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0	-

HCM 6th AWSC
45: Iron Dustoff Dr & Constitution Ave

PM Build Out Peak Hour
05/28/2021

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	44	33	19	0	26	1	65	1	0	0	0	42
Future Vol, veh/h	44	33	19	0	26	1	65	1	0	0	0	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	36	21	0	28	1	71	1	0	0	0	46
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.1	7.7	8.8	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	99%	0%	73%	0%	0%	0%	0%	0%
Vol Thru, %	1%	100%	27%	46%	100%	90%	100%	0%
Vol Right, %	0%	0%	0%	54%	0%	10%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	1	61	36	17	10	0	42
LT Vol	65	0	44	0	0	0	0	0
Through Vol	0	1	17	17	17	9	0	0
RT Vol	0	0	0	19	0	1	0	42
Lane Flow Rate	71	1	66	39	19	11	0	46
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.107	0.001	0.095	0.048	0.026	0.014	0	0.054
Departure Headway (Hd)	5.401	4.903	5.227	4.487	4.93	4.857	4.939	4.237
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	667	733	689	801	729	740	0	848
Service Time	3.11	2.611	2.938	2.197	2.642	2.569	2.649	1.947
HCM Lane V/C Ratio	0.106	0.001	0.096	0.049	0.026	0.015	0	0.054
HCM Control Delay	8.8	7.6	8.5	7.4	7.8	7.6	7.6	7.2
HCM Lane LOS	A	A	A	A	A	A	N	A
HCM 95th-tile Q	0.4	0	0.3	0.2	0.1	0	0	0.2

HCM 6th AWSC
48: Iron Medics Dr & Iron Dustoff Dr

PM Opening Year Peak Hour
07/15/2021

Intersection	
Intersection Delay, s/veh	6.1
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	72	0	0	0	22
Future Vol, veh/h	0	72	0	0	0	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	78	0	0	0	24
Number of Lanes	0	2	2	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	5.9	0	6.6
HCM LOS	A	-	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	0%	0%	0%	0%
Vol Thru, %	100%	100%	0%	0%	100%	100%
Vol Right, %	0%	0%	100%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	36	36	11	11
LT Vol	0	0	0	0	0	0
Through Vol	0	0	0	0	11	11
RT Vol	0	0	36	36	0	0
Lane Flow Rate	0	0	39	39	12	12
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0	0	0.042	0.023	0.016	0.01
Departure Headway (Hd)	4.683	2.947	3.877	2.142	4.669	2.933
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	0	927	1675	773	1231
Service Time	2.376	0.64	1.584	-0.15	2.359	0.624
HCM Lane V/C Ratio	0	0	0.042	0.023	0.016	0.01
HCM Control Delay	7.4	5.6	6.8	4.9	7.4	5.7
HCM Lane LOS	N	N	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0.1	0	0

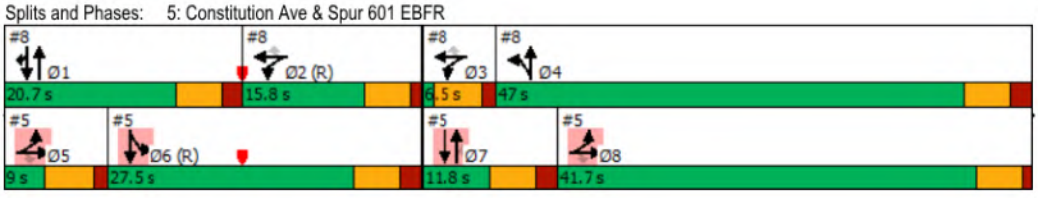
Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

AM 2032 Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	1	193	0	0	0	0	82	31	151	152	0
Future Volume (vph)	162	1	193	0	0	0	0	82	31	151	152	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.953								0.950		
Satd. Flow (prot)	1681	1686	1583	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.953								0.950		
Satd. Flow (perm)	1681	1686	1583	0	0	0	0	3539	1583	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			210						245			
Link Speed (mph)		30			35			35			30	
Link Distance (ft)		148			245			425			300	
Travel Time (s)		3.4			4.8			8.3			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	1	210	0	0	0	0	89	34	164	165	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	88	89	210	0	0	0	0	89	34	164	165	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	5 8	5 8						7		6	6 7	
Permitted Phases			5 8						7			
Total Split (s)								11.8	11.8	27.5		
Total Lost Time (s)								5.8	5.8	6.0		
Act Effct Green (s)	17.0	17.0	17.0					6.8	6.8	48.9	61.5	
Actuated g/C Ratio	0.19	0.19	0.19					0.08	0.08	0.54	0.68	
v/c Ratio	0.28	0.28	0.45					0.33	0.10	0.17	0.07	
Control Delay	32.7	32.7	7.6					42.8	0.6	4.6	1.0	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	32.7	32.7	7.6					42.8	0.6	4.6	1.0	
LOS	C	C	A					D	A	A	A	
Approach Delay		19.1						31.1			2.8	
Approach LOS		B						C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 37.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Constitution Ave & Spur 601 EBFR



Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

AM 2032 Peak Hour
05/28/2021

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	1	2	3	4	5	8
Permitted Phases						
Total Split (s)	20.7	15.8	6.5	47.0	9.0	41.7
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

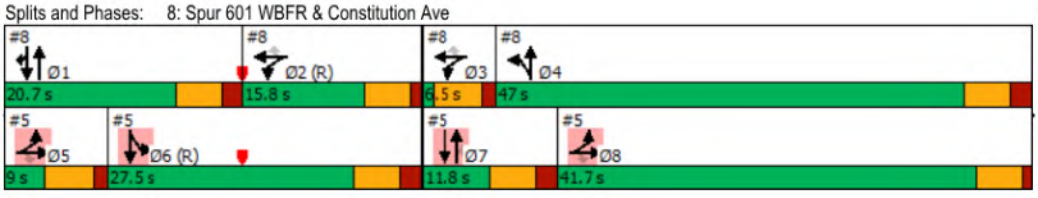
Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

AM 2032 Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	112	1	101	60	174	0	0	180	220
Future Volume (vph)	0	0	0	112	1	101	60	174	0	0	180	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1681	1686	1583	1770	3539	0	0	3539	1583
Flt Permitted				0.950	0.953		0.950					
Satd. Flow (perm)	0	0	0	1681	1686	1583	1770	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						172						239
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		139			242			300			606	
Travel Time (s)		3.2			5.5			6.8			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	122	1	110	65	189	0	0	196	239
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	61	62	110	65	189	0	0	196	239
Turn Type				Split	NA	Perm	Prot	NA			NA	Prot
Protected Phases				2 3	2 3		4	1 4			1	1
Permitted Phases						2 3						
Total Split (s)							47.0				20.7	20.7
Total Lost Time (s)							6.0				5.7	5.7
Act Effct Green (s)				50.6	50.6	50.6	12.3	28.7			10.4	10.4
Actuated g/C Ratio				0.56	0.56	0.56	0.14	0.32			0.12	0.12
v/c Ratio				0.06	0.07	0.11	0.27	0.17			0.48	0.61
Control Delay				11.5	11.5	0.8	33.8	0.9			40.6	11.9
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				11.5	11.5	0.8	33.8	0.9			40.6	11.9
LOS				B	B	A	C	A			D	B
Approach Delay					6.5			9.3			24.8	
Approach LOS					A			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 37.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Spur 601 WBFR & Constitution Ave



Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

AM 2032 Peak Hour
05/28/2021

Lane Group	Ø2	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	2	3	5	6	7	8
Permitted Phases						
Total Split (s)	15.8	6.5	9.0	27.5	11.8	41.7
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

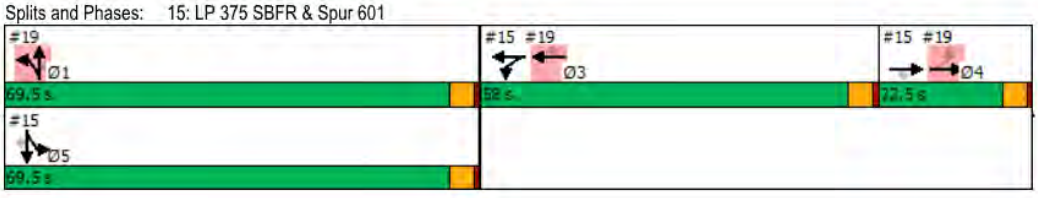
Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

AM 2032 Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	122	778	272	2525	0	0	0	0	2	70	172
Future Volume (vph)	0	122	778	272	2525	0	0	0	0	2	70	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt			0.850									0.850
Flt Protected					0.995					0.950		
Satd. Flow (prot)	0	3539	1583	0	3522	0	0	0	0	1681	1770	1583
Flt Permitted					0.995					0.950		
Satd. Flow (perm)	0	3539	1583	0	3522	0	0	0	0	1681	1770	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			648									187
Link Speed (mph)		60			60			65			30	
Link Distance (ft)		943			294			303			201	
Travel Time (s)		10.7			3.3			3.2			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	133	846	296	2745	0	0	0	0	2	76	187
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	133	846	0	3041	0	0	0	0	2	76	187
Turn Type		NA	Perm	Split	NA					Split	NA	Perm
Protected Phases		4		3	3					5	5	
Permitted Phases			4									5
Total Split (s)		22.5	22.5	58.0	58.0					69.5	69.5	69.5
Total Lost Time (s)		4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)		18.0	18.0		53.5					65.0	65.0	65.0
Actuated g/C Ratio		0.12	0.12		0.36					0.43	0.43	0.43
v/c Ratio		0.31	1.11		2.42					0.00	0.10	0.24
Control Delay		62.6	81.5		663.6					24.0	25.7	4.0
Queue Delay		0.0	0.0		1.6					0.0	0.0	0.0
Total Delay		62.6	81.5		665.1					24.0	25.7	4.0
LOS		E	F		F					C	C	A
Approach Delay		78.9			665.1						10.4	
Approach LOS		E			F						B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 3.39			
Intersection Signal Delay: 490.7		Intersection LOS: F	
Intersection Capacity Utilization 141.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 15: LP 375 SBFR & Spur 601



Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

AM 2032 Peak Hour
05/28/2021

Lane Group	Ø1
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	1
Permitted Phases	
Total Split (s)	69.5
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

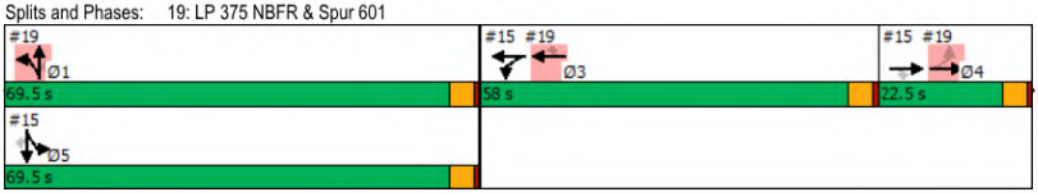
AM 2032 Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	23	0	0	344	24	2390	17	90	0	0	0
Future Volume (vph)	102	23	0	0	344	24	2390	17	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected		0.961					0.950					
Satd. Flow (prot)	0	3401	0	0	3539	1583	1770	1863	1583	0	0	0
Flt Permitted		0.619					0.950					
Satd. Flow (perm)	0	2191	0	0	3539	1583	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						44			98			
Link Speed (mph)		60			40			65			65	
Link Distance (ft)		294			593			284			254	
Travel Time (s)		3.3			10.1			3.0			2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	25	0	0	374	26	2598	18	98	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	374	26	2598	18	98	0	0	0
Turn Type	Perm	NA			NA	Perm	Split	NA	Perm			
Protected Phases		4			3		1	1				
Permitted Phases	4					3			1			
Total Split (s)	22.5	22.5			58.0	58.0	69.5	69.5	69.5			
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5	4.5			
Act Effct Green (s)		18.0			53.5	53.5	65.0	65.0	65.0			
Actuated g/C Ratio		0.12			0.36	0.36	0.43	0.43	0.43			
v/c Ratio		0.94dl			0.30	0.04	3.39	0.02	0.13			
Control Delay		13.8			35.5	3.4	1093.8	24.6	4.8			
Queue Delay		0.0			0.2	0.0	26.5	0.0	0.0			
Total Delay		13.8			35.7	3.4	1120.2	24.6	4.8			
LOS		B			D	A	F	C	A			
Approach Delay		13.8			33.6			1072.7				
Approach LOS		B			C			F				

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 3.39
Intersection Signal Delay: 900.5 Intersection LOS: F
Intersection Capacity Utilization 158.8% ICU Level of Service H
Analysis Period (min) 15
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 19: LP 375 NBFR & Spur 601



Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

AM 2032 Peak Hour
05/28/2021

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	69.5
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

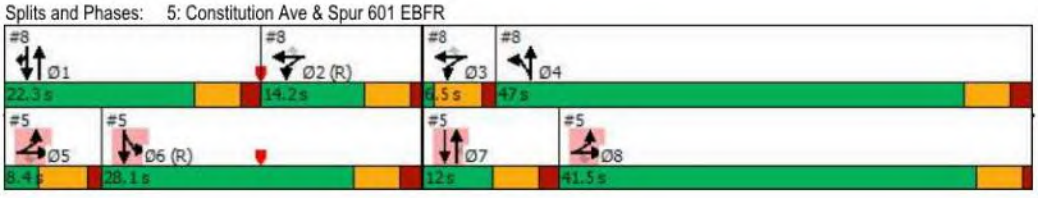
Intersection Summary

Lanes, Volumes, Timings PM 2032 Peak Hour
5: Constitution Ave & Spur 601 EBFR 05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	6	95	0	0	0	0	100	85	248	53	0
Future Volume (vph)	37	6	95	0	0	0	0	100	85	248	53	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.966								0.950		
Satd. Flow (prot)	1681	1709	1583	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.966								0.950		
Satd. Flow (perm)	1681	1709	1583	0	0	0	0	3539	1583	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			172						245			
Link Speed (mph)		30			35			35			30	
Link Distance (ft)		148			245			425			300	
Travel Time (s)		3.4			4.8			8.3			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	7	103	0	0	0	0	109	92	270	58	0
Shared Lane Traffic (%)	42%											
Lane Group Flow (vph)	23	24	103	0	0	0	0	109	92	270	58	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	5 8	5 8						7		6	6 7	
Permitted Phases			5 8						7			
Total Split (s)								12.0	12.0	28.1		
Total Lost Time (s)								5.8	5.8	6.0		
Act Effct Green (s)	14.1	14.1	14.1					7.4	7.4	51.2	64.4	
Actuated g/C Ratio	0.16	0.16	0.16					0.08	0.08	0.57	0.72	
v/c Ratio	0.09	0.09	0.26					0.38	0.26	0.27	0.02	
Control Delay	33.0	33.0	2.4					42.5	1.8	5.1	0.2	
Queue Delay	0.0	0.0	0.0					0.0	0.0	4.6	0.0	
Total Delay	33.0	33.0	2.4					42.5	1.8	9.7	0.2	
LOS	C	C	A					D	A	A	A	
Approach Delay		12.0						23.9			8.0	
Approach LOS		B						C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 13.6		Intersection LOS: B	
Intersection Capacity Utilization 40.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Constitution Ave & Spur 601 EBFR



Lanes, Volumes, Timings
5: Constitution Ave & Spur 601 EBFR

PM 2032 Peak Hour
05/28/2021

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	1	2	3	4	5	8
Permitted Phases						
Total Split (s)	22.3	14.2	6.5	47.0	8.4	41.5
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

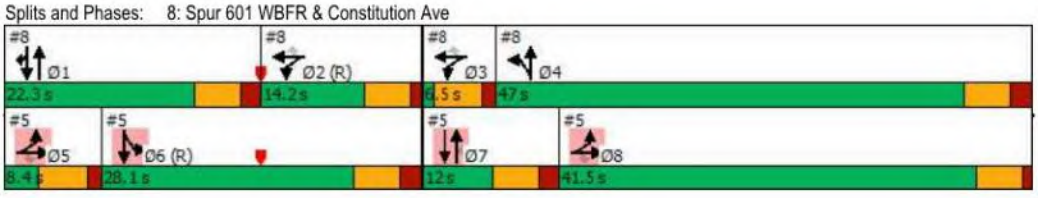
Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

PM 2032 Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	17	1	17	89	47	0	0	284	273
Future Volume (vph)	0	0	0	17	1	17	89	47	0	0	284	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950	0.957		0.950					
Satd. Flow (prot)	0	0	0	1681	1694	1583	1770	3539	0	0	3539	1583
Flt Permitted				0.950	0.957		0.950					
Satd. Flow (perm)	0	0	0	1681	1694	1583	1770	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						172						297
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		139			242			300			606	
Travel Time (s)		3.2			5.5			6.8			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	18	1	18	97	51	0	0	309	297
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	0	0	10	9	18	97	51	0	0	309	297
Turn Type				Split	NA	Perm	Prot	NA			NA	Prot
Protected Phases				2 3	2 3		4	1 4			1	1
Permitted Phases						2 3						
Total Split (s)							47.0				22.3	22.3
Total Lost Time (s)							6.0				5.7	5.7
Act Effct Green (s)				49.7	49.7	49.7	10.3	29.6			13.2	13.2
Actuated g/C Ratio				0.55	0.55	0.55	0.11	0.33			0.15	0.15
v/c Ratio				0.01	0.01	0.02	0.48	0.04			0.60	0.61
Control Delay				11.8	11.8	0.1	31.0	0.4			40.2	9.9
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.1	0.0
Total Delay				11.8	11.8	0.1	31.0	0.4			40.3	9.9
LOS				B	B	A	C	A			D	A
Approach Delay					6.1			20.5			25.4	
Approach LOS					A			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:, Start of Green			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 23.6		Intersection LOS: C	
Intersection Capacity Utilization 40.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Spur 601 WBFR & Constitution Ave



Lanes, Volumes, Timings
8: Spur 601 WBFR & Constitution Ave

PM 2032 Peak Hour
05/28/2021

Lane Group	Ø2	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations						
Traffic Volume (vph)						
Future Volume (vph)						
Ideal Flow (vphpl)						
Lane Util. Factor						
Frt						
Flt Protected						
Satd. Flow (prot)						
Flt Permitted						
Satd. Flow (perm)						
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)						
Link Distance (ft)						
Travel Time (s)						
Peak Hour Factor						
Adj. Flow (vph)						
Shared Lane Traffic (%)						
Lane Group Flow (vph)						
Turn Type						
Protected Phases	2	3	5	6	7	8
Permitted Phases						
Total Split (s)	14.2	6.5	8.4	28.1	12.0	41.5
Total Lost Time (s)						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

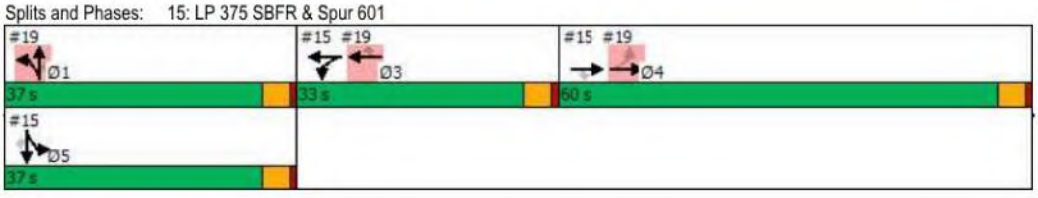
Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

PM 2032 Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	129	2349	459	989	0	0	0	0	2	70	165
Future Volume (vph)	0	129	2349	459	989	0	0	0	0	2	70	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt			0.850									0.850
Flt Protected					0.984					0.950		
Satd. Flow (prot)	0	3539	1583	0	3483	0	0	0	0	1681	1770	1583
Flt Permitted					0.984					0.950		
Satd. Flow (perm)	0	3539	1583	0	3483	0	0	0	0	1681	1770	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			419									179
Link Speed (mph)		60			60			65			30	
Link Distance (ft)		943			294			303			201	
Travel Time (s)		10.7			3.3			3.2			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	140	2553	499	1075	0	0	0	0	2	76	179
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	140	2553	0	1574	0	0	0	0	2	76	179
Turn Type		NA	Perm	Split	NA					Split	NA	Perm
Protected Phases		4		3	3					5	5	
Permitted Phases			4									5
Total Split (s)		60.0	60.0	33.0	33.0					37.0	37.0	37.0
Total Lost Time (s)		4.5	4.5		4.5					4.5	4.5	4.5
Act Effct Green (s)		55.5	55.5		28.5					32.5	32.5	32.5
Actuated g/C Ratio		0.43	0.43		0.22					0.25	0.25	0.25
v/c Ratio		0.09	2.79		2.06					0.00	0.17	0.34
Control Delay		22.5	825.0		498.5					37.0	39.5	7.2
Queue Delay		0.0	0.0		0.0					0.0	0.0	0.0
Total Delay		22.5	825.0		498.5					37.0	39.5	7.2
LOS		C	F		F					D	D	A
Approach Delay		783.3			498.5						17.0	
Approach LOS		F			F						B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 2.79			
Intersection Signal Delay: 640.7		Intersection LOS: F	
Intersection Capacity Utilization 201.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 15: LP 375 SBFR & Spur 601



Lanes, Volumes, Timings
15: LP 375 SBFR & Spur 601

PM 2032 Peak Hour
05/28/2021

Lane Group	Ø1
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	1
Permitted Phases	
Total Split (s)	37.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

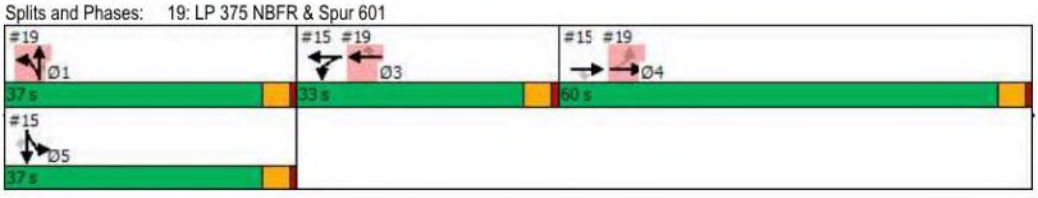
Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

PM 2032 Peak Hour
05/28/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	23	0	0	704	87	725	17	53	0	0	0
Future Volume (vph)	102	23	0	0	704	87	725	17	53	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected		0.961					0.950					
Satd. Flow (prot)	0	3401	0	0	3539	1583	1770	1863	1583	0	0	0
Flt Permitted		0.532					0.950					
Satd. Flow (perm)	0	1883	0	0	3539	1583	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						92			58			
Link Speed (mph)		60			40			65			65	
Link Distance (ft)		294			593			284			254	
Travel Time (s)		3.3			10.1			3.0			2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	25	0	0	765	95	788	18	58	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	765	95	788	18	58	0	0	0
Turn Type	Perm	NA			NA	Perm	Split	NA	Perm			
Protected Phases		4			3		1	1				
Permitted Phases	4					3			1			
Total Split (s)	60.0	60.0			33.0	33.0	37.0	37.0	37.0			
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5	4.5			
Act Effct Green (s)		55.5			28.5	28.5	32.5	32.5	32.5			
Actuated g/C Ratio		0.43			0.22	0.22	0.25	0.25	0.25			
v/c Ratio		0.17			0.99	0.23	1.78	0.04	0.13			
Control Delay		4.1			79.8	10.1	391.4	37.4	10.0			
Queue Delay		0.0			41.5	0.0	11.0	0.0	0.0			
Total Delay		4.1			121.3	10.1	402.4	37.4	10.0			
LOS		A			F	B	F	D	A			
Approach Delay		4.1			109.0			368.5				
Approach LOS		A			F			F				

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green			
Control Type: Pretimed			
Maximum v/c Ratio: 2.79			
Intersection Signal Delay: 221.9		Intersection LOS: F	
Intersection Capacity Utilization 76.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 19: LP 375 NBFR & Spur 601



Lanes, Volumes, Timings
19: LP 375 NBFR & Spur 601

PM 2032 Peak Hour
05/28/2021

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Total Split (s)	37.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

HCM 6th TWSC
34: Iron Medics Dr & LP 375 N

AM 2032 Peak Hour
05/28/2021

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	459	2	70	0
Future Vol, veh/h	0	0	459	2	70	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	499	2	76	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	0	0	1000	-
Stage 1	-	-	0	-
Stage 2	-	-	1000	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	270	0
Stage 1	-	-	-	0
Stage 2	-	-	356	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	270	-
Mov Cap-2 Maneuver	-	-	270	-
Stage 1	-	-	-	-
Stage 2	-	-	356	-

Approach	WB	NB
HCM Control Delay, s		23.5
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	270	-	-
HCM Lane V/C Ratio	0.282	-	-
HCM Control Delay (s)	23.5	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	1.1	-	-

HCM 6th TWSC
36: Iron Medics Dr & Loop 375 S

AM 2032 Peak Hour
05/28/2021

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	177	0	0	0	0	68	215	2	462	0
Future Vol, veh/h	2	1	177	0	0	0	0	68	215	2	462	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	192	0	0	0	0	74	234	2	502	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	697	814	502	-	0	0	308	0	0
Stage 1	506	506	-	-	-	-	-	-	-
Stage 2	191	308	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	407	312	569	0	-	-	1253	-	0
Stage 1	606	540	-	0	-	-	-	-	0
Stage 2	841	660	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	406	0	569	-	-	-	1253	-	-
Mov Cap-2 Maneuver	406	0	-	-	-	-	-	-	-
Stage 1	606	0	-	-	-	-	-	-	-
Stage 2	839	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	566	1253	-
HCM Lane V/C Ratio	-	-	0.346	0.002	-
HCM Control Delay (s)	-	-	14.7	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.5	0	-

HCM 6th AWSC
45: Iron Dustoff Dr & Constitution Ave

AM 2032 Peak Hour
05/28/2021

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	47	78	219	1	53	4	17	1	0	0	3	43
Future Vol, veh/h	47	78	219	1	53	4	17	1	0	0	3	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	51	85	238	1	58	4	18	1	0	0	3	47
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.7	7.9	8.9	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	98%	0%	55%	0%	4%	0%	0%	0%
Vol Thru, %	2%	100%	45%	15%	96%	87%	100%	2%
Vol Right, %	0%	0%	0%	85%	0%	13%	0%	98%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	1	86	258	28	31	2	44
LT Vol	17	0	47	0	1	0	0	0
Through Vol	0	1	39	39	27	27	2	1
RT Vol	0	0	0	219	0	4	0	43
Lane Flow Rate	19	1	93	280	30	33	2	48
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.032	0.001	0.129	0.319	0.042	0.045	0.003	0.064
Departure Headway (Hd)	6.038	5.544	4.961	4.092	5.022	4.911	5.515	4.827
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	596	648	714	864	716	732	652	746
Service Time	3.745	3.252	2.752	1.883	2.733	2.622	3.222	2.533
HCM Lane V/C Ratio	0.032	0.002	0.13	0.324	0.042	0.045	0.003	0.064
HCM Control Delay	8.9	8.3	8.5	8.8	8	7.9	8.2	7.9
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.4	1.4	0.1	0.1	0	0.2

HCM 6th AWSC
48: Iron Medics Dr & Iron Dustoff Dr

AM 2032 Peak Hour
07/13/2021

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	24	0	0	236	0
Future Vol, veh/h	0	24	0	0	236	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	0	0	257	0
Number of Lanes	0	2	2	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	6.4	0	10.6
HCM LOS	A	-	B

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	0%	0%	100%	0%
Vol Thru, %	100%	100%	0%	0%	0%	100%
Vol Right, %	0%	0%	100%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	12	12	236	0
LT Vol	0	0	0	0	236	0
Through Vol	0	0	0	0	0	0
RT Vol	0	0	12	12	0	0
Lane Flow Rate	0	0	13	13	257	0
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0	0	0.016	0.01	0.362	0
Departure Headway (Hd)	4.708	2.969	4.545	2.8	5.081	4.581
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	0	792	1286	711	0
Service Time	2.487	0.746	2.245	0.5	2.785	2.284
HCM Lane V/C Ratio	0	0	0.016	0.01	0.361	0
HCM Control Delay	7.5	5.7	7.3	5.5	10.6	7.3
HCM Lane LOS	N	N	A	A	B	N
HCM 95th-tile Q	0	0	0	0	1.7	0

HCM 6th TWSC
34: Iron Medics Dr & LP 375 N

PM 2032 Peak Hour
05/28/2021

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	462	4	74	0
Future Vol, veh/h	0	0	462	4	74	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	502	4	80	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	0	0	1008	-
Stage 1	-	-	0	-
Stage 2	-	-	1008	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	267	0
Stage 1	-	-	-	0
Stage 2	-	-	353	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	267	-
Mov Cap-2 Maneuver	-	-	267	-
Stage 1	-	-	-	-
Stage 2	-	-	353	-

Approach	WB	NB
HCM Control Delay, s		24.2
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	267	-	-
HCM Lane V/C Ratio	0.301	-	-
HCM Control Delay (s)	24.2	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	1.2	-	-

HCM 6th TWSC
36: Iron Medics Dr & Loop 375 S

PM 2032 Peak Hour
05/28/2021

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	57	177	0	0	0	0	68	215	6	462	0
Future Vol, veh/h	8	57	177	0	0	0	0	68	215	6	462	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	62	192	0	0	0	0	74	234	7	502	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	707	824	502	-	0	0	308	0	0
Stage 1	516	516	-	-	-	-	-	-	-
Stage 2	191	308	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	402	308	569	0	-	-	1253	-	0
Stage 1	599	534	-	0	-	-	-	-	0
Stage 2	841	660	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	399	0	569	-	-	-	1253	-	-
Mov Cap-2 Maneuver	399	0	-	-	-	-	-	-	-
Stage 1	599	0	-	-	-	-	-	-	-
Stage 2	834	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	559	1253	-
HCM Lane V/C Ratio	-	-	0.471	0.005	-
HCM Control Delay (s)	-	-	17	7.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2.5	0	-

HCM 6th AWSC
45: Iron Dustoff Dr & Constitution Ave

PM 2032 Peak Hour
05/28/2021

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	70	21	0	54	1	73	1	0	0	0	47
Future Vol, veh/h	50	70	21	0	54	1	73	1	0	0	0	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	76	23	0	59	1	79	1	0	0	0	51
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.4	8	9.1	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	59%	0%	0%	0%	0%	0%
Vol Thru, %	0%	100%	41%	62%	100%	95%	100%	0%
Vol Right, %	0%	0%	0%	38%	0%	5%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	1	85	56	36	19	0	47
LT Vol	73	0	50	0	0	0	0	0
Through Vol	0	1	35	35	36	18	0	0
RT Vol	0	0	0	21	0	1	0	47
Lane Flow Rate	80	1	92	61	39	21	0	51
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.124	0.001	0.134	0.079	0.055	0.029	0	0.063
Departure Headway (Hd)	5.608	5.109	5.233	4.674	5.025	4.988	5.156	4.453
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	641	702	687	769	715	720	0	806
Service Time	3.325	2.825	2.949	2.39	2.743	2.706	2.874	2.171
HCM Lane V/C Ratio	0.125	0.001	0.134	0.079	0.055	0.029	0	0.063
HCM Control Delay	9.1	7.8	8.8	7.8	8	7.9	7.9	7.5
HCM Lane LOS	A	A	A	A	A	A	N	A
HCM 95th-tile Q	0.4	0	0.5	0.3	0.2	0.1	0	0.2

HCM 6th AWSC
48: Iron Medics Dr & Iron Dustoff Dr

PM 2032 Peak Hour
07/13/2021

Intersection	
Intersection Delay, s/veh	6.4
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	87	0	0	26	0
Future Vol, veh/h	0	87	0	0	26	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	95	0	0	28	0
Number of Lanes	0	2	2	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	5.9	0	8.1
HCM LOS	A	-	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	0%	0%	100%	0%
Vol Thru, %	100%	100%	0%	0%	0%	100%
Vol Right, %	0%	0%	100%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	44	44	26	0
LT Vol	0	0	0	0	26	0
Through Vol	0	0	0	0	0	0
RT Vol	0	0	44	44	0	0
Lane Flow Rate	0	0	47	47	28	0
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0	0	0.051	0.028	0.041	0
Departure Headway (Hd)	4.711	2.975	3.883	2.148	5.196	4.696
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	0	920	1653	694	0
Service Time	2.411	0.675	1.615	-0.121	2.887	2.386
HCM Lane V/C Ratio	0	0	0.051	0.028	0.04	0
HCM Control Delay	7.4	5.7	6.8	4.9	8.1	7.4
HCM Lane LOS	N	N	A	A	A	N
HCM 95th-tile Q	0	0	0.2	0.1	0.1	0

D Appendix D: Water Capacity and Consumption Analysis Report

U.S. Department of Veterans Affairs

Fort Bliss Veterans Affairs Health Care Center
Water Capacity and Consumption Analysis Report

September 2021

Prepared for:
U.S. Department of Veterans Affairs
Office of Construction and Facilities Management

Prepared by:
LRS Federal LLC

Table of Contents

1.0 Introduction 1
2.0 Methodology and Approach 3
2.1 Background 3
2.2 Estimated Water Demands 3
2.3 Utility Capacity 4
3.0 References 4
A Appendix A: Utility Correspondence

List of Tables

Table 2-1. Summary of HCC Estimated Water Demands 3

List of Figures

Figure 1-1. Aerial View of the Proposed Action 2

Acronyms and Abbreviations

BGSF	building gross square feet
DPW	Department of Public Works
EP Water	El Paso Water
gpd	gallons per day
gph	gallons per hour
gpm	gallons per minute
HCC	health care center
LRS	LRS Federal LLC
PRD	Program Requirement Document
VA	U.S. Department of Veterans Affairs
WBAMC	William Beaumont Army Medical Center

1.0 Introduction

LRS Federal LLC (LRS) was contracted to analyze the forecasted water capacity and consumption for the proposed Fort Bliss Veterans Affairs (VA) Health Care Center (HCC) located on Fort Bliss in El Paso, Texas (Figure 1-1). The proposed HCC would consist of an approximately 500,000 building gross square feet (BGSF) health care center on a 30-acre site adjacent to the new William Beaumont Army Medical Center (WBAMC) on Fort Bliss in El Paso, Texas. The site would include approximately 2,000 surface parking spaces, a central energy plant, and other site improvements, amenities, and landscaped areas, including new stormwater and sanitary lines. No demolition would be required since the site is currently undeveloped.

The site layout has not yet been defined, nor have the buildings and structures been designed. The final design is anticipated to include multiple low-rise buildings with no more than five floors. The configuration of the site would take into consideration parking, roadways, stormwater retention, possible future expansion, and building physical security requirements. Design and construction of the VA HCC is anticipated to begin in 2023 with anticipated completion of construction in 2027. The HCC would be used Monday through Friday except on federal holidays and would be available to Veterans and service members from all branches of the U.S. Armed Forces who meet the criteria for treatment.

The purpose of this report is to assess the anticipated water demands of the HCC and the capacity of the utility provider to meet those demands to ensure that the HCC is provided with an uninterrupted supply of potable, industrial, and fire protection water services.

Figure 1-1. Aerial View of the Proposed Action

2.0 Methodology and Approach

2.1 Background

LRS assessed the capacity for El Paso Water (EP Water) to meet the demand and flow rate requirements for potable, industrial, and fire protection water services at the proposed VA HCC. The Program Requirement Document (PRD) dated 2 August 2021, outlines engineering requirements and design considerations for the project, including a detailed description of existing infrastructure in the surrounding vicinity of the site. According to the PRD, a 36-inch water main, owned by EP Water, runs along the northeast side of Loop 375. The HCC would be serviced by a direct line from this water main. VA Site Design Criteria recommends providing two water service connections from separate sources, supplying full water demand to the project site to ensure an uninterrupted supply. Redundancy could not be achieved since the EP Water and Fort Bliss Department of Public Works (DPW) water mains are supplied by the same source. Therefore, redundancy would be achieved by establishing onsite water storage tanks. These water storage tanks would be connected to the Fort Bliss DPW owned 36-inch water main and would be located adjacent to the Central Energy Plant (RLF, 2021).

2.2 Estimated Water Demands

The PRD estimates the area of the new HCC facility would be 492,996 BGSF (RLF, 2021). VA Site Design Manual dated 1 February 2013 and revised 1 April 2021 uses a water demand design standard of 0.40 gallons per day (gpd) per square foot for clinical buildings (U.S. Department of VA Office of Construction & Facilities Management, 2021). Based on the above 492,996 BGSF and the design standard of 0.40 gpd per square foot, the estimated average domestic water usage is 197,198 gpd. In order to provide for future growth at the HCC, a 20% safety factor is added for an estimated average daily domestic water demand of 236,638 gpd. It should be noted that the above calculated demand does not include the one-time water demand needed to fill the fire sprinkler, mechanical systems, and on-site water storage tanks; nor does it include any water usage for support of water-cooled mechanical systems or landscaping.

The PRD estimates annual water demand as 105,792 kilogallons per year or an average daily domestic water demand of approximately 289,841 gpd. The remainder of this report will utilize the more conservative estimate for average daily domestic water demand of 289,841 gpd as presented by the PRD (RLF, 2021).

Average daily domestic flow rate for clinics in gallons per minute (gpm) is determined by assuming 80% of the average domestic daily demand occurs in 16 hours (U.S. Department of VA Office of Construction & Facilities Management, 2021). Therefore, the estimated average daily domestic flow rate for the HCC is 241.5 gpm. Peak hourly domestic flow rates for clinics are three times the average daily domestic flow rate (U.S. Department of VA Office of Construction & Facilities Management, 2021) or 43,470 gallons per hour (gph). Fire flow for new facilities is based on the design of the building sprinkler system with the acceptable hose stream requirement (U.S. Department of VA Office of Construction & Facilities Management, 2021). The expected worse-case fire flow demand is 1,500 gpm for two hours for a total of 180,000 gallons of usable water (RLF, 2021).

A summary of estimated water demands for the VA HCC is presented below in Table 2-1.

Table 2-1. Summary of HCC Estimated Water Demands

Potable Water Flow Rates	Estimated Water Demand
Average daily domestic demand (gpd)	289,841

Average daily domestic flow rate (gpm)	241.5
Peak hourly domestic flow rate (gph)	43,470
Fire flow rate (gpm)	1,500

2.3 Utility Capacity

For purposes of determining capacity, two values were utilized: 1) the average daily domestic plus fire flow at the design residual pressure and 2) the peak hourly domestic flow rate at the design residual pressure. This was to ensure supply was available for normal 24-hour operations, but also for peak demand times (U.S. Department of VA Office of Construction & Facilities Management, 2021).

LRS requested that EP Water review the estimated water demands presented in Table 2-1 to assess their ability to meet the HCC's anticipated needs. EP Water confirmed that they are able to meet the stated demand flow rates. VA will need to determine the meter size that accommodates these needs. EP Water runs the fire flow hydraulic simulations meeting the 20-psi minimum residual pressure, as per Texas Commission on Environmental Quality standards (El Paso Water, 2021). Correspondence with EP Water is appended to this report for reference.

3.0 References

El Paso Water (email, 1 September 2021).

RLF. (2021). *Program Requirements Document.*

U.S. Department of VA Office of Construction & Facilities Management. (2021). *Site Design Manual.*

Appendix A: Utility Correspondence

Sara Schulkowski

From: Adriana Castillo
Sent: Wednesday, September 1, 2021 4:51 PM
To: Sara Schulkowski
Cc: Renata Renova
Subject: RE: Water Capacity Information Request
Attachments: Scanned from a Xerox Multifunction Printer.pdf

Sara:

As in previous discussion with Andrea Landfair and team, the proposed master meter assembly connection will be tapping out a existing 24-inch water main in a similar a manner as the Ft. Bliss Master meter (enclosed). We are able to meet the demand flow rates. VA is to determine the meter size that accommodates their needs. EPWater runs the fire flow hydraulic simulations meeting the 20 psi minimum residual pressure as per TCEQ standards.

Sincerely,

Adriana L. Castillo, P.E., C.D.T| Engineering Division Manager | Planning & Development
El Paso Water
1154 Hawkins Boulevard | El Paso, TX 79925

Jesse Byrd

From: Mack, Bruce G. (CFM) <Bruce.Mack@va.gov>
Sent: Wednesday, February 9, 2022 4:38 PM
To: Sara Schulkowski <SSchulkowski@lrsfederal.com>
Cc: Jesse Byrd <jbyrd@lrsfederal.com>
Subject: FW: VA Health Care Center - Capacity for Water Service

Sara:

Confirmation on the potable water capacity question.

VR

Bruce

From: Contreras, Ruben <Ruben.Contreras@asusinc.com>
Sent: Wednesday, February 9, 2022 3:36 PM
To: Sparkman, Sabrina L CIV USARMY CESWF (USA) <Sabrina.Sparkman@usace.army.mil>
Cc: Mack, Bruce G. (CFM) <Bruce.Mack@va.gov>; paul_lafontaine@rlfae.com; Molina, Carlos H CIV USARMY IMCOM (USA) <carlos.h.molina6.civ@army.mil>; Drummond, Robert J CIV USARMY CESWF (USA) <Robert.J.Drummond@usace.army.mil>; derrick.ohara.civ@army.mil
Subject: [EXTERNAL] RE: VA Health Care Center - Capacity for Water Service

Sabrina – confirming there is sufficient capacity.

From: Sparkman, Sabrina L CIV USARMY CESWF (USA) <Sabrina.Sparkman@usace.army.mil>
Sent: Wednesday, February 9, 2022 2:29 PM
To: Contreras, Ruben <Ruben.Contreras@asusinc.com>
Cc: Mack, Bruce <bruce.mack@va.gov>; paul_lafontaine@rlfae.com; Molina, Carlos H CIV USARMY IMCOM (USA) <carlos.h.molina6.civ@army.mil>; Drummond, Robert J CIV USARMY CESWF (USA) <Robert.J.Drummond@usace.army.mil>; derrick.ohara.civ@army.mil
Subject: VA Health Care Center - Capacity for Water Service

Good Afternoon,
Requesting confirmation that the existing potable water system has sufficient capacity to support the new 493,000 BGSF facility and CUP. The demand for the project is provided below, initially emailed 1 Sep 2021 attached. The capacity to support the facility is implied in your email response dated 23 Sep 2021. Receiving confirmation from the utility that there is sufficient water capacity is a requirement of the NEPA Environmental Analysis that is currently occurring. Email response confirming capacity is sufficient. Thank you for your time.

Water (Domestic)

- HCC average daily water flow: 200,000 GPD
- HCC average daily water flow rate: 170 GPM
- HCC peak hourly water flow rate: 25,000 GPH

- CEP average daily water flow: 165,000 GPD
- CEP average daily water flow rate: 130 GPM
- CEP peak hourly water flow rate: 13,750 GPH

V/R,
Sabrina Sparkman, PE
Program Manager
Military Programs Branch
Programs & Project Management Division
USACE, Fort Worth District
Office: 817-886-1498
Cell: 817-907-2421
819 Taylor St
Fort Worth, TX 76102