EL DORADO CITY COMMISSION - WORK SESSION AGENDA
CITY HALL – 220 E. FIRST AVENUE
October 30, 2024 - 5:00 PM

Work Session Discussion Items:

a. Transportation Master Plan

b. Civic Center Disposition

Regular Agenda Preview:

a. Items to be Placed on the Consent Agenda

  i. City Commission Work Session Minutes from October 16, 2024, and City Commission Meeting Minutes from October 21, 2024.

b. Items to be Placed on the Regular Agenda

  i. Resolution Issuing Industrial Revenue Bonds

  ii. Project No. 597- Garcia Qt Special Assessments

Reports:

a. City Commission Reports

b. City Manager Report

EL DORADO TRANSPORTATION STUDY

El Dorado, Kansas

Prepared by:

JEO CONSULTING GROUP

SEPTEMBER 2024

Executive Summary

EXECUTIVE SUMMARY

The El Dorado Transportation Study provides a comprehensive assessment of the city's current transportation system and outlines a strategic plan for its future development.

The study identifies key challenges and opportunities for improvement, **focusing on safety, efficiency, and accessibility for all residents.** Through extensive community engagement and data analysis, the study has developed a vision for future transportation in El Dorado, along with **goals, objectives, and performance measures to guide implementation.**

The study highlights several known transportation priorities in El Dorado, including road maintenance, pedestrian and bicycle infrastructure, and development and growth corridors. Challenges for these opportunities include limited funding sources, increasing traffic congestion and a growing population. However, the study also identifies opportunities for innovative solutions, such as grant opportunities and asset management.

The vision for future transportation in El Dorado is to create a **safe, efficient, and sustainable transportation system that enhances the quality of life for all residents. This vision includes improving connectivity, enhancing accessibility for pedestrians and cyclists,** and promoting development with wise investment in infrastructure. By prioritizing sustainability, equity, and accessibility, El Dorado aims to create a transportation system that meets the needs of a growing and diverse population.

To achieve this vision, the study proposes a series of goals:

- **A safe multimodal transportation system for everyone.**
- **An efficient, reliable, and well-connected transportation system.**
- **A comprehensive pedestrian and bicycle network to support trips for work and leisure.**
- **A well-maintained and sustainable transportation system.**
- **An accessible system that promotes transportation choices for all citizens while also supporting economic vitality.**

Objectives with specific, measurable steps have been established for each goal. Performance measures will be used to track progress and evaluate the effectiveness of the plan, ensuring that El Dorado's transportation system remains responsive to the needs of its residents. Identified performance measures fall under the categories of safety measures, infrastructure condition measures, and system performance measures.

Transportation Trends highlight the importance of developing a transportation plan that accommodates the diverse needs of the community and promotes sustainable transportation options.

- Demographics: From the year 2000 through 2022, the population of El Dorado has been stable, experiencing a slight increase to 12,865 persons.
- Traffic Volumes: Over the past 20 years, the growth in traffic volumes has been slow, but steady. Looking to the future, traffic volumes are expected to increase by about 0.5 percent per year.
- Funding: Recent state and federal programs have increased the funding available for transportation improvements.
- Active Transportation: There is a growing interest in biking and walking with the need to expand and upgrade the facilities for these forms of transportation.

Current and Future Conditions were analyzed to determine needs for the transportation system.

- Safety: The study reviewed the crash data for the 5-year period 2018 to 2022, including the frequency, severity, and types of crashes. A list of the top 20 crash locations based on frequency was determined.
- Vulnerable Road Users: The study shows the roadways that were identified using the Kansas Department of Transportation's Vulnerable Road User Assessment tool.
- Roadway Network: The current roadway network has the vehicle-carrying capacity to serve the city through the year 2045. Existing streets do not require additional lanes to handle expected future traffic volumes, although intersection improvements at key locations are recommended. New roads will be needed to support development in the north and south areas of the city.
- Bicycle Network: Bicycle facilities are currently recreational in nature and connect the downtown area to El Dorado Lake and its system of trails. Opportunities exist to develop bicycle facilities to serve a transportation role in the city, providing residents and visitors with connections to businesses and attractions. Other cities have seen economic growth as a result of developing a robust bicycle network.
- Sidewalk Network: Sidewalks serve the core of the city and are located along major streets. Future development should include the construction of sidewalks.
- Transit: The city should continue to support the paratransit services in the area.

Overall, the El Dorado Transportation Study provides a roadmap for the future development of the city's transportation system, highlighting the importance of sustainability, equity, and accessibility. By implementing the recommendations outlined in this study, El Dorado can create a transportation system that is safe, efficient, and inclusive, enhancing the overall quality of life for its residents.

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SECTION 1

Introduction

INTRODUCTION

PURPOSE OF THE TRANSPORTATION STUDY

The purpose of this transportation study is to comprehensively assess the current transportation system in El Dorado, Kansas, and to develop a strategic plan for its future enhancement. The study aims to identify key issues and opportunities for improvement, focusing on safety, efficiency, and accessibility for all residents. By analyzing existing transportation infrastructure and traffic patterns, the study will provide a roadmap for long-term, sustainable transportation enhancement in El Dorado.

Transportation infrastructure serves as a critical catalyst for economic development, playing a pivotal role in enhancing accessibility, connectivity, efficiency, and facilitating the seamless movement of people and goods. Recognizing its significance, the City of El Dorado has initiated a comprehensive transportation study aimed at providing valuable insights into the planning process for transportation infrastructure that will effectively support the region's future livability, land use and economic growth.

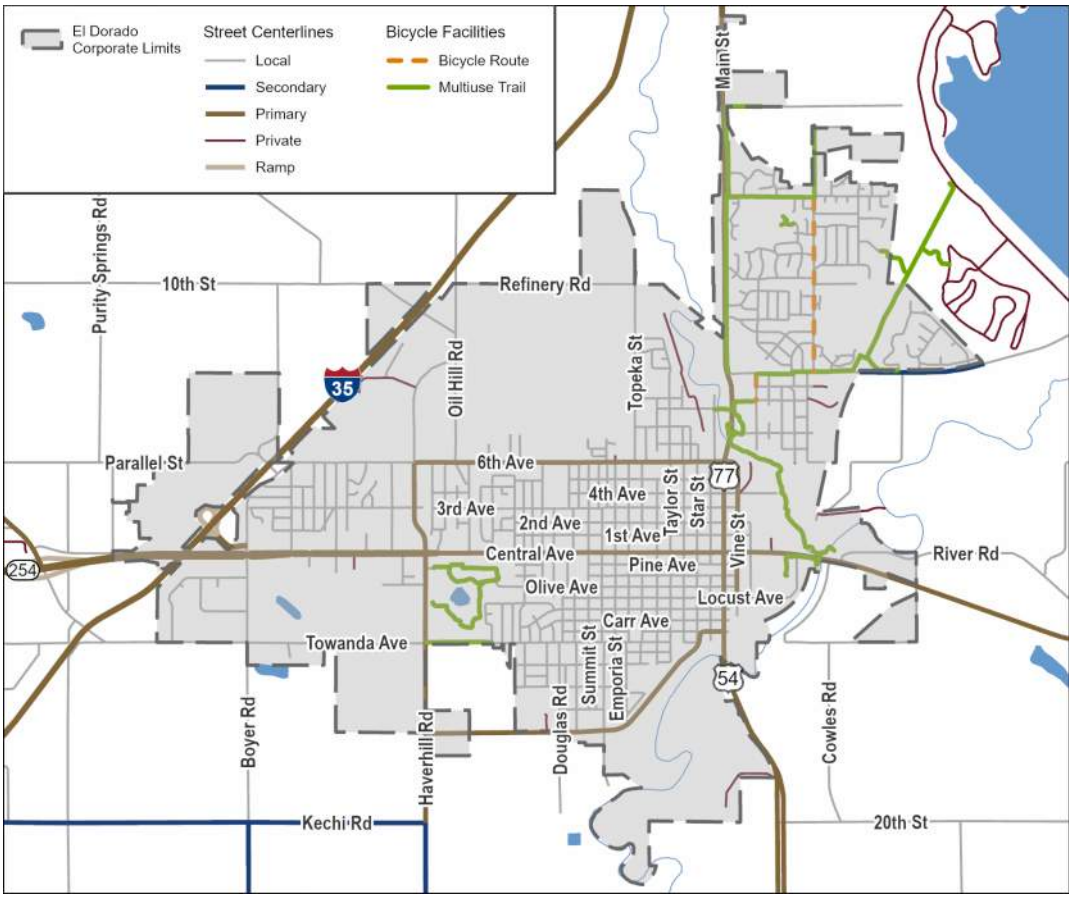


Figure 1: El Dorado Transportation Network

CHALLENGES & OPPORTUNITIES

The transportation system of El Dorado faces several challenges, including aging infrastructure and increasing traffic congestion. These challenges are exacerbated by the large amount of industrial truck traffic that passes through the city. The city has also identified a need for multimodal and pedestrian improvements to increase access to major amenities. These challenges present opportunities for innovative future solutions. For example, improving multi-modal transportation and incorporating new technologies can help address these challenges and enhance overall transportation efficiency and sustainability.

OVERVIEW OF THE STUDY PROCESS & COMMUNITY ENGAGEMENT

The transportation study consisted of a comprehensive review of existing transportation data, both previously acquired and collected as part of the study. The review focused on traffic volumes and crash statistics. Additionally, extensive community engagement was conducted to gather input from residents, businesses, and other stakeholders. This process included public meetings and online surveys to ensure that the transportation plan reflects the needs and priorities of the El Dorado community. The study process received 264 survey responses and comments identifying specific issues with the current transportation system.

KNOWN ISSUES

Several known transportation issues impact the efficiency and safety of the city's transportation system. Issues identified through the community engagement process and through analysis of the system include:

- The need to develop a roadway network that supports the potential development areas on the north and west sides of the city.
- Buildout of streets, sidewalks, and intersections, which should occur in advance of new developments. The network should be expandable and flexible and consider the use of roundabouts.
- A desire for more and better-connected bikeways and sidewalks/walking paths. These facility types provide mobility for those residents who do not drive, don't own vehicles, or are seeking a healthier lifestyle.
- Butler County Paratransit is a great asset to the community and needs to be supported and promoted.
- New northern and southern bypasses would support development and relieve congestion on existing streets.
- Maintenance of existing infrastructure is important.
- The transportation network is critical to existing businesses and for attracting new businesses.
- Concerns for traffic safety, especially for vulnerable road users.

TRANSPORTATION TRENDS

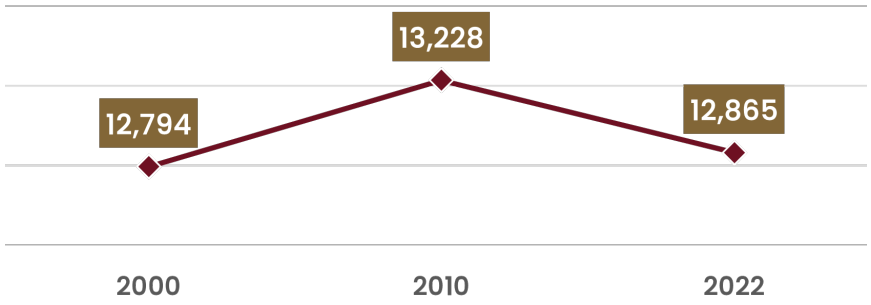
These trends highlight the importance of developing a transportation plan that accommodates the diverse needs of the community and promotes sustainable transportation options.

Demographics

El Dorado, Kansas, has seen fluctuations in population over the past two decades, with periods of growth and decline. From 2000 to 2010, the population increased by 3.39%, reaching a peak of 13,228 in 2010. However, from 2010 to 2020, the population decreased by 2.84%, and as of 2022, it stands at approximately 12,865.

El Dorado's demographic composition is predominantly White, making up 86.8% of the population, followed by small percentages of other racial groups, including Hispanic or Latino (4.5%), Black or African American (1.5%), and Asian (1.5%). The age distribution shows a diverse mix, with significant portions of the population being under 18 (24.3%) and over 65 (15.9%). It is considered family-friendly, with 51% of families having children under 18 and a strong emphasis on community and educational opportunities. The city's economy is diverse, with significant employment in education, healthcare, and manufacturing.

TOTAL POPULATION



RACE & AGE COMPOSITIONS

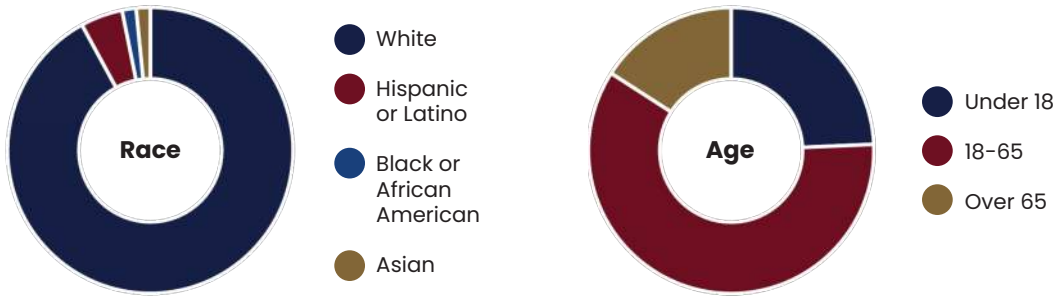


Figure 2: El Dorado Demographics

Transportation

- **Traffic Volumes:** The volume of traffic has followed similar periods of growth and decline to the ones that the population has experienced. Traffic count maps from KDOT were reviewed for every year from 2000 to 2022. Volumes were compared in various locations along K-254, US-77, and I-35. Over the last 20 years, it was observed that traffic growth has been slow, but steady. Looking to the future, traffic volumes are expected to increase by about 0.5 percent per year.
- **Funding for Transportation:** Recent state and federal programs have increased the funding available for transportation improvements for roads, bridges, and active transportation, although the market for transportation funds is still very competitive between cities, as the need continues to outweigh the resources available.
- **Active Transportation:** There is a growing interest in biking and walking with the need to expand and upgrade the facilities for these forms of transportation.
- **Innovative Technologies:** KDOT is implementing Intelligent Transportation Systems (ITS) to improve traffic management and safety. Some of these initiatives will likely benefit El Dorado as part of broader statewide initiatives.
- **Traffic Calming:** Identified in the 2005 El Dorado Traffic Study, Traffic Calming refers to a set of strategies used to reduce vehicle speeds, improve safety and create more livable streets for pedestrians and cyclists by influencing driver behavior. El Dorado could consider adopting a formal Traffic Calming policy which provides structure around addressing vehicle speed and traffic volume complaints. Good practices include:
  - **engineering justification** using real data on speeds and traffic volumes and considering street functional classification
  - **identifying areas of impact,** recognizing that measures may shift traffic patterns and the entire affected area should be considered in the solution
  - **community involvement,** as these decisions should not be driven by a minority but represent the wishes of a broad majority
  - **use of diverse measures,** including striping, speed humps, raised crosswalks, curb extensions, traffic circles, chicanes, and signage to influence driver behavior
  - **trial installations,** allowing a low cost temporary solution to be evaluated for engineering effectiveness and community buy-in
  - **permanent application,** with broad community buy-in, creates safer, livable streets for all users.

- **Access Management:** Identified in the 2030 El Dorado Comprehensive Plan, Access Management is the coordinated planning, regulation, and design of access points along roadways to improve traffic flow, enhance safety, and maximize the efficient use of roadway infrastructure. It involves controlling the location, design, and operation of driveways, median openings, street connections, and other access points to ensure that they are optimally placed and designed to balance the needs of various road users. Intelligent use of access management supports economic development, helps the environment, and maximizes the use of the transportation public asset.

SECTION 2

Vision, Goals, & Performance Measures

VISION, GOALS, & PERFORMANCE MEASURES

VISION STATEMENT FOR FUTURE TRANSPORTATION

The vision for future transportation in El Dorado is to create a safe, efficient, and sustainable transportation system that enhances the quality of life for all residents. This vision includes improving the connectivity of the transportation network and enhancing accessibility for pedestrians and cyclists. By prioritizing safety, sustainability, and equity, El Dorado aims to create a transportation system that meets the needs of its residents and visitors.

GOALS & OBJECTIVES

The goals of the transportation study are to improve safety, reduce congestion, enhance mobility, and promote economic development. These goals will be achieved through a series of objectives, including the development of a comprehensive transportation plan, the implementation of targeted infrastructure improvements, and the promotion of alternative modes of transportation. By setting clear goals and objectives, El Dorado can measure the success of its transportation plan and track progress towards achieving its vision for the future.

- **Goals** are typically long-term, visionary, and qualitative, providing a sense of direction and purpose.
- **Objectives** are specific, measurable steps or milestones that help achieve a goal.
- **Outcomes** are the changes or benefits that occur as a result of the objectives being met.

GOAL	OBJECTIVE
A safe multimodal transportation system for everyone.	• Reduce the number and rate of severe crashes on the transportation system. • Identify and improve safe crossings for vehicles, bicycles, and pedestrians across major arterial streets and at intersections. • Assess options to identify and protect areas with a high proportion of vulnerable road users such as near schools, public facilities, and commercial districts.
An efficient, reliable, and well-connected transportation system.	• Provide a network of arterials, collectors, and local streets that are interconnected, appropriately spaced, and provide proper capacity for growth. • Reduce delays and congestion and optimize traffic flow by improving signal timings in traffic corridors. Maintain and update traffic signal equipment and improve intersection to intersection communications. • Maintain appropriate functional classification and street operation integrity through management of access and the right-of-way in context with adjacent land use.
A comprehensive pedestrian and bicycle network to support trips for work and leisure.	• Increase connectivity of the pedestrian and bicycle network of sidewalks and trails to key destinations including downtown, and education facilities including colleges and K-12 schools. • Eliminate sidewalk gaps and non-ADA compliant curb ramps within the community. • Identify sidewalk and trail corridors with recommended minimum path widths based on anticipated use; Utilize established typical sections in future improvements.
A well-maintained and sustainable transportation system.	• Preserve and maintain the existing transportation system assets to extend their useful life. • Implement robust asset management practices to track transportation system asset conditions and program necessary preservation and maintenance projects. • Evaluate and implement cost-effective, sustainable materials and design approaches.
An accessible system that promotes transportation choices for all citizens while also supporting economic vitality.	• Promote land development that supports the needs of all transportation modes, ensuring citizens can easily access job opportunities to foster economic growth. • Identify opportunities for future major corridor developments for the attraction of large-scale industrial investment into the city. • Continue to involve citizens and community organizations in the transportation planning process, gathering feedback to ensure transportation choices and align with the community.

DESIRED OUTCOMES

1. An integrated plan that effectively considers local and regional needs, aligns with federal requirements, and is comparable with state planning efforts.
2. A clear transportation vision for the City of El Dorado that reflects community values and supports the City's desire for economic development and active transportation policies.
3. Data-driven prioritization of projects that address immediate needs and catalytic projects, prioritized to move into the CIP.
4. A compelling narrative about the success of policy changes that are improving the preservation of existing streets and expansion of active transportation networks, helping to position El Dorado for sustainable funding initiatives.
5. A forward ready plan that effectively integrates infrastructure, human, and data resource decision-making and positions El Dorado to leverage emerging transportation technologies.

SUSTAINABILITY, EQUITY, AND ACCESSIBILITY

Sustainability, equity, and accessibility will be guiding principles in the development of the transportation plan. The study will analyze the total system to prioritize sustainable, comprehensive, long-term improvements to the system. The plan will seek to ensure equitable and easy access to transportation services for all residents. By prioritizing these principles, El Dorado can create a transportation system that is not only efficient and safe but also inclusive.

PERFORMANCE MEASURES

Specific performance measures will be used to track the progress of the transportation plan and evaluate its effectiveness. Key performance indicators will include measures of safety, congestion, mobility, and economic development, among others. Regular monitoring and reporting will ensure the plan remains responsive to the evolving needs of the community. By measuring performance against established goals and objectives, El Dorado can make informed decisions about future transportation investments and ensure that its transportation system continues to meet the needs of its residents.

Safety Measures

- Number of Fatal & Severe Injury Crashes
- Number of Crashes Involving a Vulnerable Road User
- Number of Crashes Occurring at the Top 20 Intersections

Infrastructure Condition Measures

- Percentage of Pavement in Good Condition
- Number of Bridges in Poor Condition
- Linear Miles of Bicycle Facilities
- Linear Miles of Sidewalks

System Performance Measures

- Number of Intersections with Traffic Signals that are Operating at Level of Service C or Better

SECTION 3

Previous Plans & Studies

PREVIOUS PLANS & STUDIES

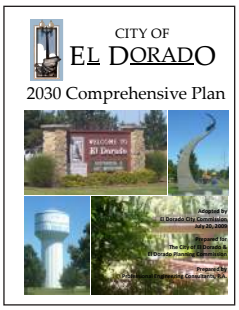
This section documents many plans and studies that helped guide the development of the Transportation Study. Summaries of those documents and how they influence transportation for El Dorado are included below.

EL DORADO STRATEGIC PLAN 2021

Developed in 2021, the El Dorado Strategic Plan identifies the goals of the city regarding fiscal stewardship, municipal workforce, economic development, quality of life, municipal operations, and infrastructure.

Infrastructure: The city invests in its public infrastructure to ensure that the community has the most basic resources necessary to thrive and prosper.

- **"1.** Adopt and implement a multi-year Capital Improvement Program…"
- **"2.** Continuously evaluate public facilities to ensure…proper investment for maintenance, and facilitate the planning of new or renovation of such facilities…"
- **"4.** Evaluate funding options for continued investment in critical public infrastructure."



2030 EL DORADO COMPREHENSIVE PLAN

The 2030 El Dorado Comprehensive Plan was developed in 2009. The goal of this plan is to present a vision of the City of El Dorado. The plan sets specific goals for improvements to public services, parks and recreation, housing, historic preservation, economic development, infrastructure, and land use. Recommendations include developing a transportation master plan, a Safe Routes to School plan, and an access management policy while also preserving adequate right-of-way, encouraging development that allows for connectivity and alternate modes of transportation, and exploring transit opportunities.

Goal 2: Transportation – Develop a comprehensive transportation network based upon the relationship between land use and transportation that promotes travel options and provides adequate access to property parcels.

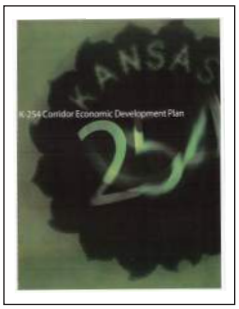
Objective 2.1: Facilitate safe and efficient movement of traffic within and through El Dorado.

Objective 2.2: Improve multimodal transportation options for the general public.

Objective 2.3: Facilitate safe, efficient multimodal student transportation for all educational levels.

EL DORADO TRUCK ROUTE TRAFFIC ENGINEERING ASSISTANCE PROGRAM (TEAP) STUDY

The El Dorado Truck Route TEAP Study, developed in 2022, provides guidance for improving the existing truck route signing and increasing compliance from commercial truck drivers. Most truck drivers were focused on their GPS routes and didn't see existing signs. This study's recommendations include an improved signing plan and partnering with organizations that have a stake in trucking operations.

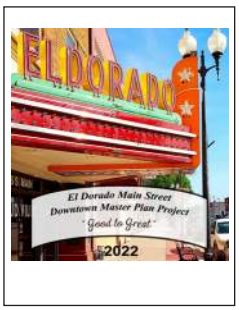


K-254 CORRIDOR ECONOMIC DEVELOPMENT PLAN

The 2005 K-254 Corridor Economic Development Plan studies the K-254 corridor and the nearby communities. The report identifies short and long-term strategies that counties, cities, developers, neighborhoods, and KDOT can take to encourage public-desired, community-focused development while also maintaining safety, preserving rural character, and using existing infrastructure.

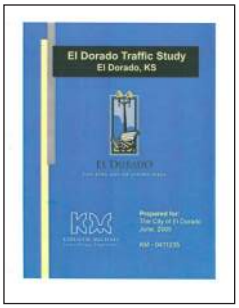
Roadway Preservation: The commuting ease and convenience that currently exists along Highway 254 should be preserved.

Safety: "The safety of all residents and commuters of the K-254 Corridor should be paramount. As the corridor continues to grow…increase in traffic could lead to increases in accidents and collisions."



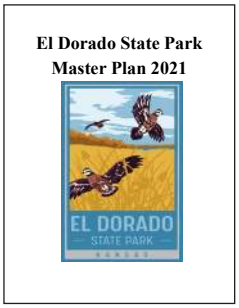
EL DORADO MAIN STREET DOWNTOWN MASTER PLAN PROJECT

Developed in 2022, the El Dorado Main Street Master Plan Project seeks to encourage development and investment in the downtown area. The project report lists strategies to improve the experience and appeal of El Dorado's downtown through policy, events, and physical improvements. Transportation-related strategies involve seeking KDOT grants, charging stations, parking redesign, traffic studies, curb painting schedules, bike paths, bike amenities, and evaluating transit feasibility.



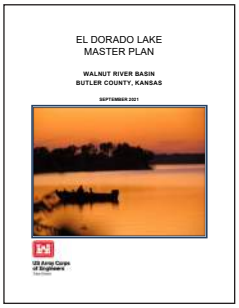
EL DORADO TRAFFIC STUDY

Completed in 2005, the El Dorado Traffic Study aimed to develop a transportation network for the existing and future community of El Dorado. Future land use plans were used to project 2030 arterial traffic and develop recommended roadway improvements including widening, extension, bridge construction, and traffic calming measures.



EL DORADO STATE PARK MASTER PLAN 2021

Developed in 2021, The El Dorado State Park Master Plan serves as a guide for current and future operations and development for the largest state park in Kansas. The 4,000-acre park averages up to one million visitors annually and has plans for future development and events.



EL DORADO LAKE MASTER PLAN

The El Dorado Lake Master Plan, developed in 2021, is a comprehensive plan developed by the US Army Corps of Engineers. The plan serves as a guide for the management and development of El Dorado Lake and its surrounding land during the period 2021 to 2046.

CONNECT 2025 MASTER PLAN

Developed in 2015, the Connect 2025 Master Plan serves as a plan for the management and development of current and future Parks & Recreation facilities and staff. Community stakeholder and citizen surveys guide recommendations that support improved trail connectivity, improvements, and additions to existing park facilities, and creating a new park complex.

SECTION 4

Economic Development & Land Use

ECONOMIC DEVELOPMENT & LAND USE

RELATIONSHIP BETWEEN TRANSPORTATION, LAND USE, & ECONOMIC DEVELOPMENT

Land use and demographics are key elements to understanding the transportation system and anticipating where new or improved facilities may be needed. Transportation infrastructure serves as a catalyst for economic development, playing a key role in enhancing accessibility, connectivity, efficiency, and facilitating the seamless movement of people and goods.

Transportation infrastructure can profoundly shape land use patterns and urban development dynamics. Commercial, residential, and industrial developments are propelled by the accessibility afforded by efficient multimodal transportation networks. This enhanced accessibility not only fosters economic activities but also serves as a magnet, attracting businesses and residents alike to areas endowed with strong transportation links.

Shovel-Ready Development Areas

El Dorado is an ideal location for manufacturers looking for a rich industrial water source and abundant accessibility to transportation, land, and talent. 1,600 acres on the north and northwest parts of the community are available for development. The study looked at the existing roads and potential new roads needed to support development in these areas.

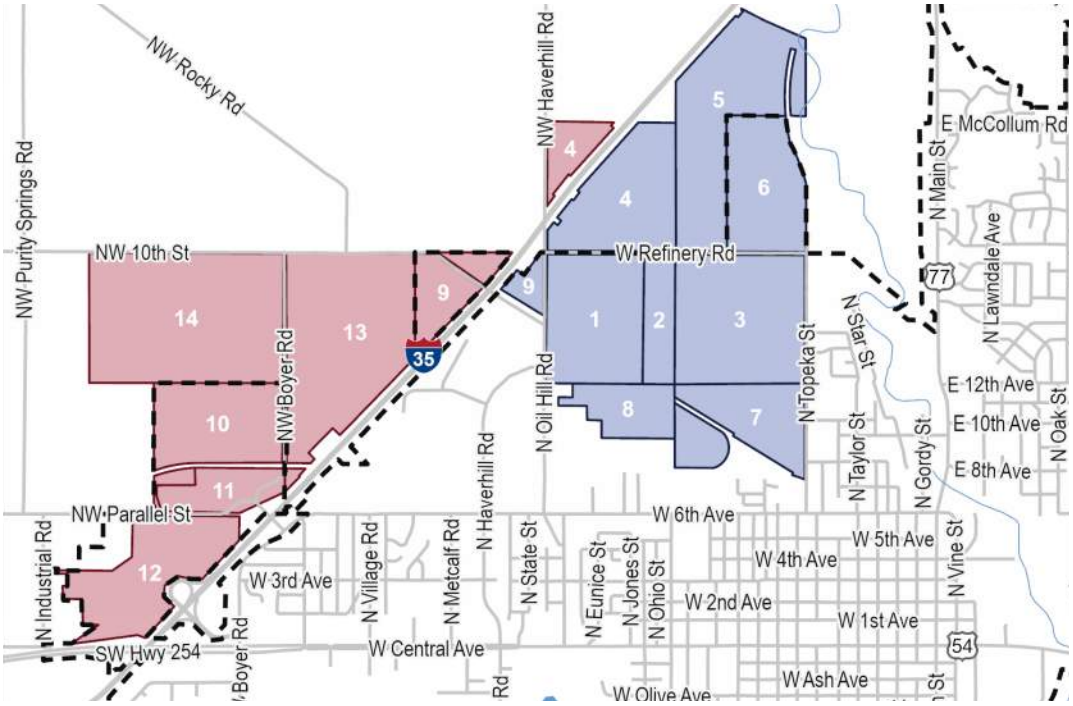


Figure 3: Shovel-Ready Development Areas

LEVERAGING TRANSPORTATION INVESTMENTS

The benefits of improved transportation infrastructure go beyond commerce and industry, extending to the areas of tourism and recreation. By making destinations more accessible, enhanced transportation infrastructure unlocks the full potential of tourism and recreational activities, stimulating economic development in key areas such as the downtown district and areas that serve the picturesque El Dorado Lake.

In summary, transportation infrastructure plays a pivotal role in shaping the socio-economic landscape of the region. The City of El Dorado will leverage investments in transportation infrastructure to foster sustainable growth, prosperity, and enhanced quality of life for its residents and visitors alike.

FUTURE LAND USE

Future land use planning is essential for creating livable, resilient, and sustainable communities. Effective land use planning supports the development of necessary infrastructure such as roads, utilities, and public services. It ensures that infrastructure is strategically located to serve the needs of the community.

The Future Land Use Map Figure 4 for El Dorado represents the preferred future land use scenario for the city.

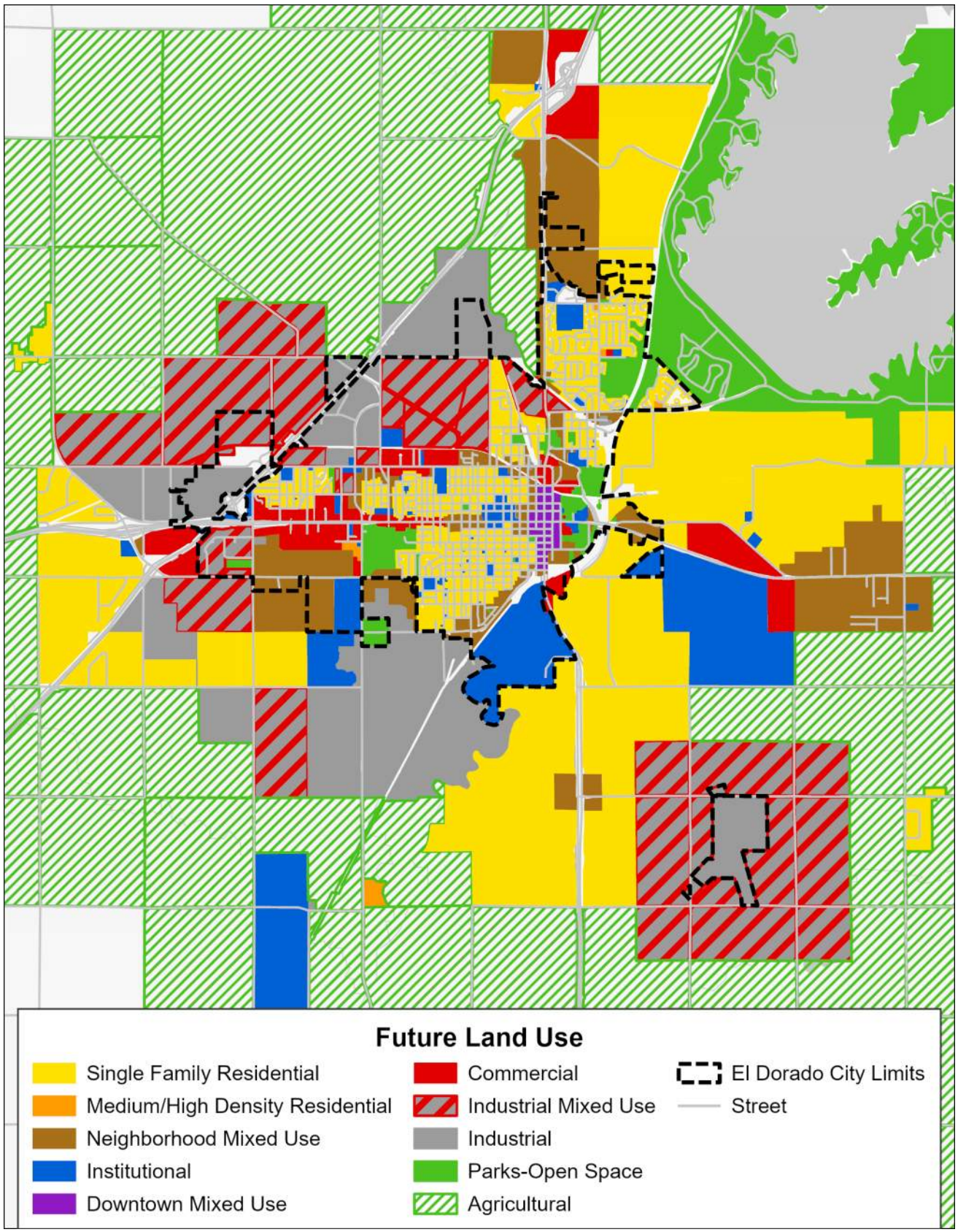


Figure 4: Future Land Use

SECTION 5

Current Conditions Assessment

CURRENT CONDITIONS ASSESSMENT

This section documents the current conditions of the multimodal transportation system that serves drivers, bicyclists, pedestrians, transit riders, and freight movement in the City of El Dorado.

This assessment and inventory of the existing transportation system presents a snapshot of how transportation is provided to El Dorado residents and visitors today.

SAFETY

Crash History

Crash data for the City of El Dorado was reviewed for the 5-year period 2018 to 2022. The frequency, severity, and types of crashes are summarized and mapped below.

Table 1: Crash Frequency and Severity 2018-2022

Fatal	5
Severe Injury	24
Non-Incapacitating Injury	131
Possible Injury	105
Property Damage Only (PDO)	1702
Unknown	84
Total	**2051**

Table 2: Crash Types 2018-2022

Angle	343
Animal	175
Bicyclist	14
Fixed Object	253
Head-On	50
Other Object	26
Overturned	11
Parked Vehicle	176
Pedestrian	8
Rear-End	220
Sideswipe Opposite Direction	64
Sideswipe Same Direction	22

A map of crash locations and crash severity is shown in Figure 5.

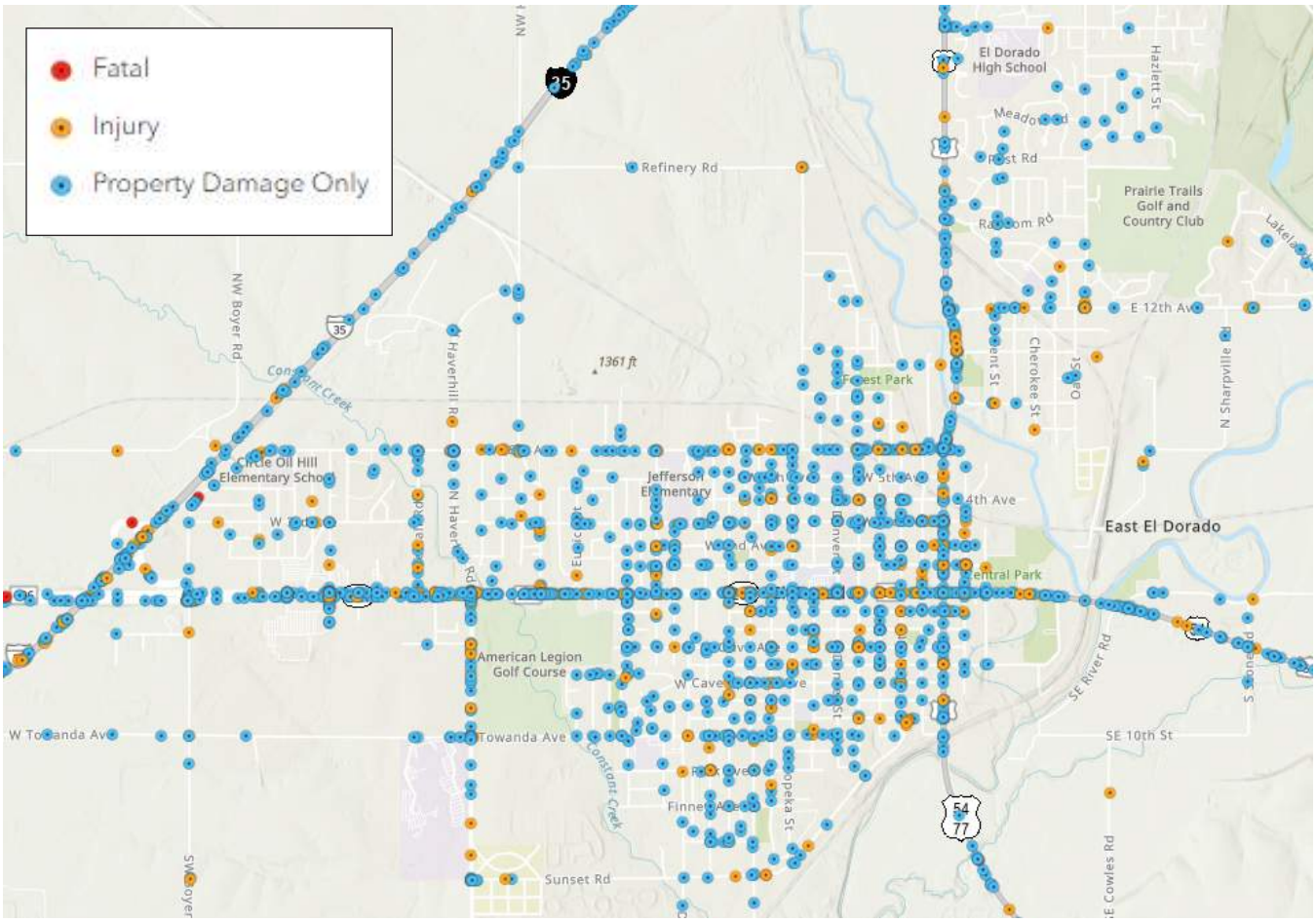


Figure 5: Crash Locations and Severity

This report studied crashes within El Dorado city limits. The map above also depicts crashes in the region.

Figure 6 is a heat map of crash frequency and is used to quickly identify areas of high intensity. Most crashes occur along Central Avenue (K-254) and along Main Street (US-77) and to a lesser degree, along 6th Avenue.

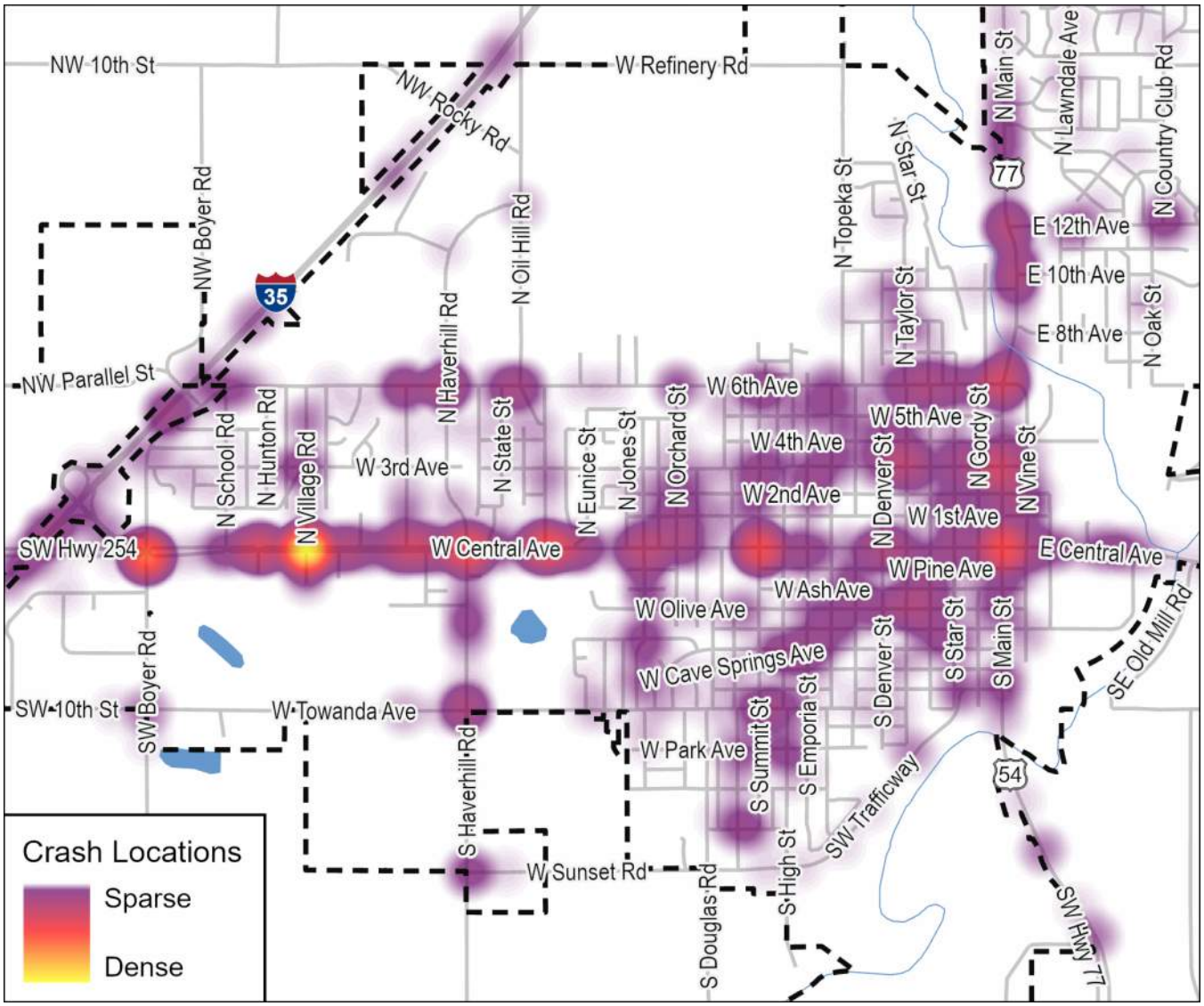


Figure 6: Crash Location "Heat" Map

From this analysis, the top 20 intersections were ranked based on crash frequency and are listed in Table 3. Calculated crash rates for the top 20 intersections are the number of crashes that occur per million entering vehicles (mev).

The critical crash rate provides a statistical threshold that helps in determining whether the observed crash rate at a particular location is higher than what would be expected based upon similar locations. This benchmarking allows for the identification of "high crash" locations that may require further investigation. The critical crash rate incorporates statistical principles to account for random variations in crash occurrences. This helps in distinguishing locations with genuinely high safety concerns.

Table 3: Top 20 Intersections Ranked by Crash Frequency

Intersection	Total Number of Crashes	Entering Daily Traffic Volume	Crash Rate (crashes/mev)	Critical Crash Rate	Above Critical Rate?
Central & Village	64	16,351	2.14	0.73	Yes
Central & Boyer	45	19,115	1.29	0.71	Yes
Central & Haverhill	34	20,164	0.92	0.71	Yes
Central & Oil Hill	31	15,512	1.10	0.74	Yes
Main & 6th	25	15,064	0.91	0.74	Yes
Central & Summit	23	14,789	0.85	0.74	Yes
Central & Main	21	12,613	0.91	0.76	Yes
Central & River	20	6,890	1.59	0.87	Yes
Main & 3rd	17	7,552	1.23	0.85	Yes
Central & Diagonal	16	15,500	0.57	0.74	No
Main & 12th	13	10,836	0.66	0.79	No
Haverhill & Towanda/10th	13	7,690	0.93	0.85	Yes
Haverhill & 6th	13	8,701	0.82	0.82	Equals
Central & Metcalf	12	15,524	0.42	0.74	No
Central & Arthur	10	13,982	0.39	0.75	No
Main & 10th	9	13,250	0.37	0.76	No
Central & Woodland	8	7,940	0.55	0.84	No
Central & Commerce	7	18,350	0.21	0.72	No
Central & School	7	15,350	0.25	0.74	No
Central & Vine	7	8,599	0.45	0.83	No

By systematically identifying and addressing locations with high crash rates, the overall safety of the road network can be improved. This report identifies some improvements for enhanced safety at key intersections. **The City of El Dorado has received a "Safe Streets for All" (SS4A) grant that will allow a more thorough investigation of safety issues.**

VULNERABLE ROAD USERS

Vulnerable Road Users (VRUs) include anyone walking, biking, or rolling by non-motorized forms of transportation. The Kansas Department of Transportation has developed a Vulnerable Road User Safety Assessment (VRUSA) tool to identify safety risks for pedestrians and cyclists.

By joining VRU injury crashes from 2014 to 2021 to roadway segments, KDOT identified a **High Injury Network (HIN)** of roadways that have a history of crashes involving a VRU. In addition, the **High-Risk Network (HRN)** was developed to identify road segments with the potential for elevated injury risk to VRUs based on a combination of road characteristics, contextual factors, and VRU usage estimates. The HRN identifies segments that may not have a history of VRU injury crashes but share common characteristics of the HIN.

Figure 7 shows the roadways in El Dorado that were identified by KDOT's VRU analysis. Yellow lines along Central Avenue, Main Street, and 6th Avenue as well as other city streets, indicate Priority Level 3 corridors, corridors on the moderate and higher levels of the HRN. Main Street between Central Avenue and 2nd Avenue is a Priority Level 1 corridor which indicates this street segment is on both the HIN and HRN networks.

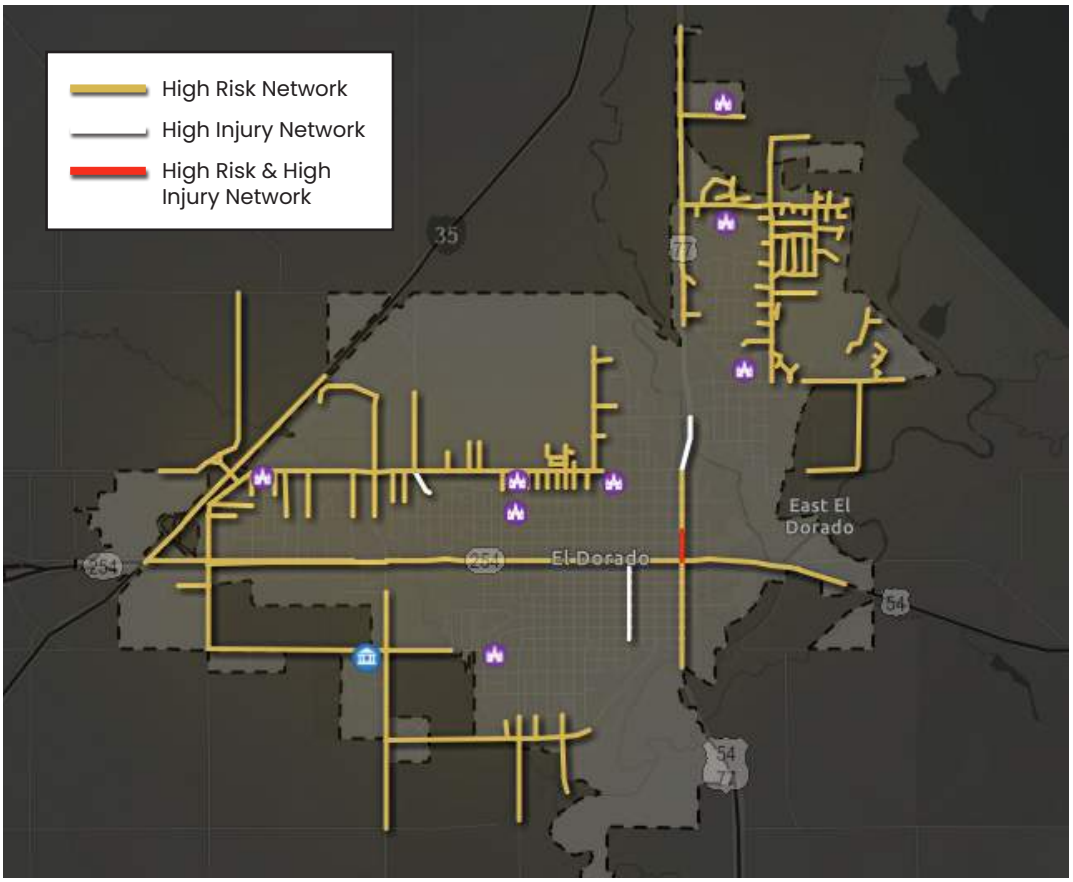
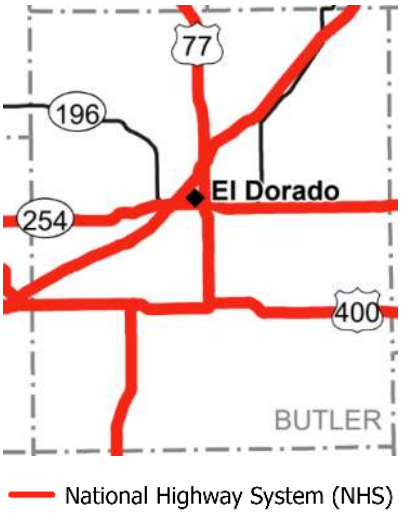


Figure 7: Kansas Vulnerable Road User Assessment Tool Results for El Dorado

STREET NETWORK

The following sections describe characteristics of the street network in El Dorado and the overall multimodal system.

National Highway System



Highway System (NHS) is a network of major highways and roads in the United States that are essential to the nation's economy, defense, and mobility. The NHS system includes federal and state highways and plays a crucial role in facilitating the movement of goods, people, and services across the country. The system connects major cities, ports, airports, and other important transportation hubs.

The designation of a road or highway as part of the NHS is important because those roads are eligible for federal funding for construction, maintenance, and improvements. This funding helps maintain the quality and safety of these key transportation routes.

NHS highways in and near El Dorado include US-77, K-254, US-54, and the Kansas Turnpike (I-35).

Functional Classification

Functional classification is based upon two factors: traffic mobility and property access. These functions somewhat conflict with each other; the traffic carrying capacity of a road decreases as access to adjacent properties increases. For example, Interstate highways and freeways carry higher traffic volumes traveling at higher speeds but have no direct access to adjacent properties. At the other end of the scale, local roads provide direct access to adjacent properties and typically have low traffic volumes and speeds.

General definitions for functional classification are:

- **Interstate Highways and Freeways** are roads meant for the through movement of vehicles at high speeds with access limited to grade separated interchanges. The Kansas Turnpike (I-35) is an example of an Interstate Highway that serves El Dorado.
- **Arterial Streets and Roads** serve major activity centers and are meant primarily for the through movement of traffic with some access to adjacent properties. Examples include Main Street (US-77), Central Avenue (K-254), 6th Avenue, Vine Street, Haverhill Road, and Sunset Road/SW Trafficway.
- **Collector Streets** connect local streets to arterial streets; these carry a higher volume of traffic than local streets. Examples include Oil Hill Road, Summit Street, Olive Avenue, and Towanda Avenue.
- **Local Streets** carry low volumes of traffic with their primary purpose to provide access to adjoining properties.

Figure 8 shows the functional classification of streets in and near El Dorado.

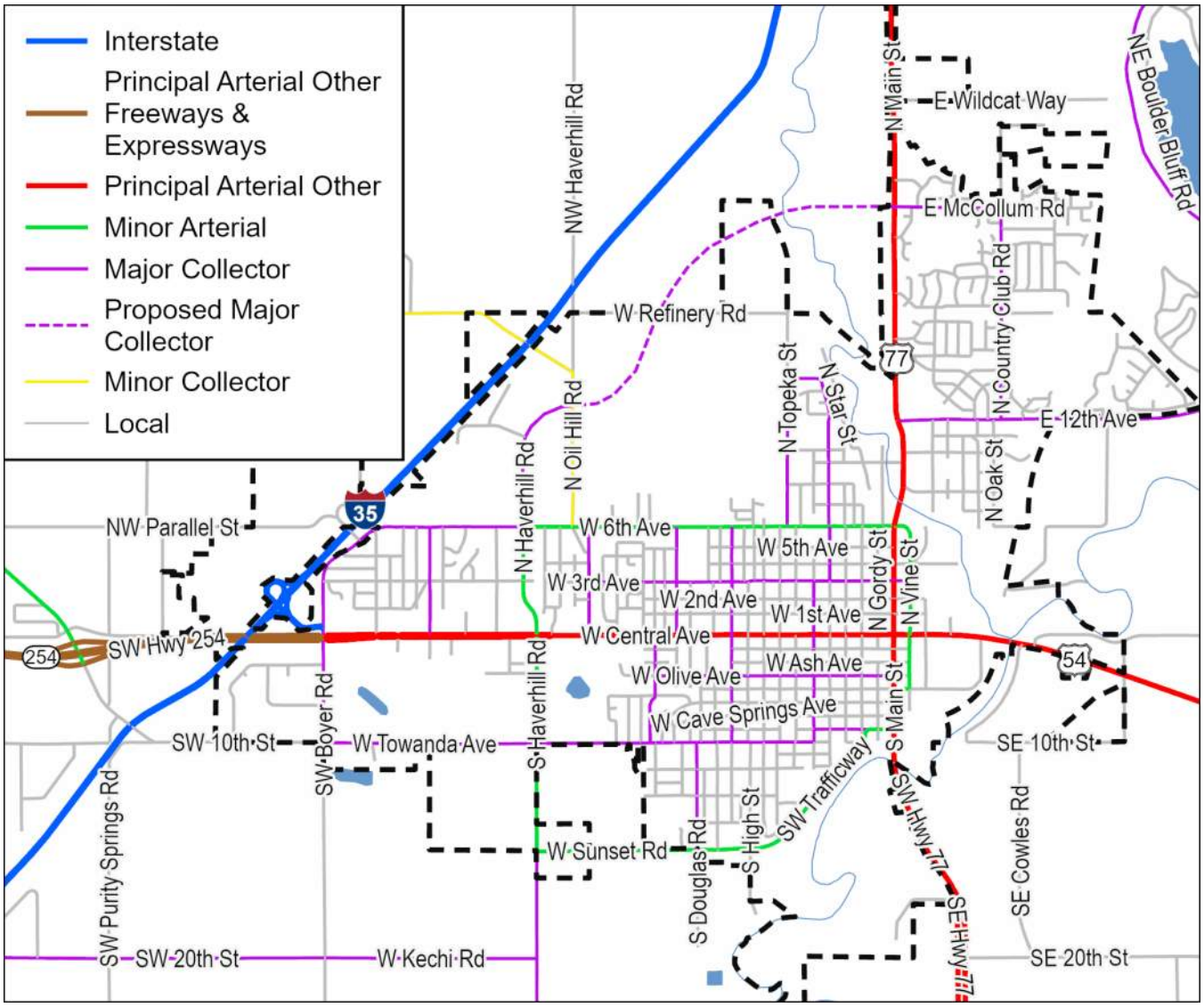


Figure 8: El Dorado Street Functional Classification

Street Characteristics

The characteristics of city streets shape the flow of traffic and facilitate the movement of people and goods in El Dorado. Key attributes defining street infrastructure include the number of lanes and their impact on traffic carrying capacity, speed limits that balance the need for expediency with considerations for pedestrian and vehicular safety, and the designation of truck routes to delineate paths tailored to accommodate commercial vehicles, mitigating congestion, and optimizing freight transportation efficiency. These characteristics are shown in the following figures.

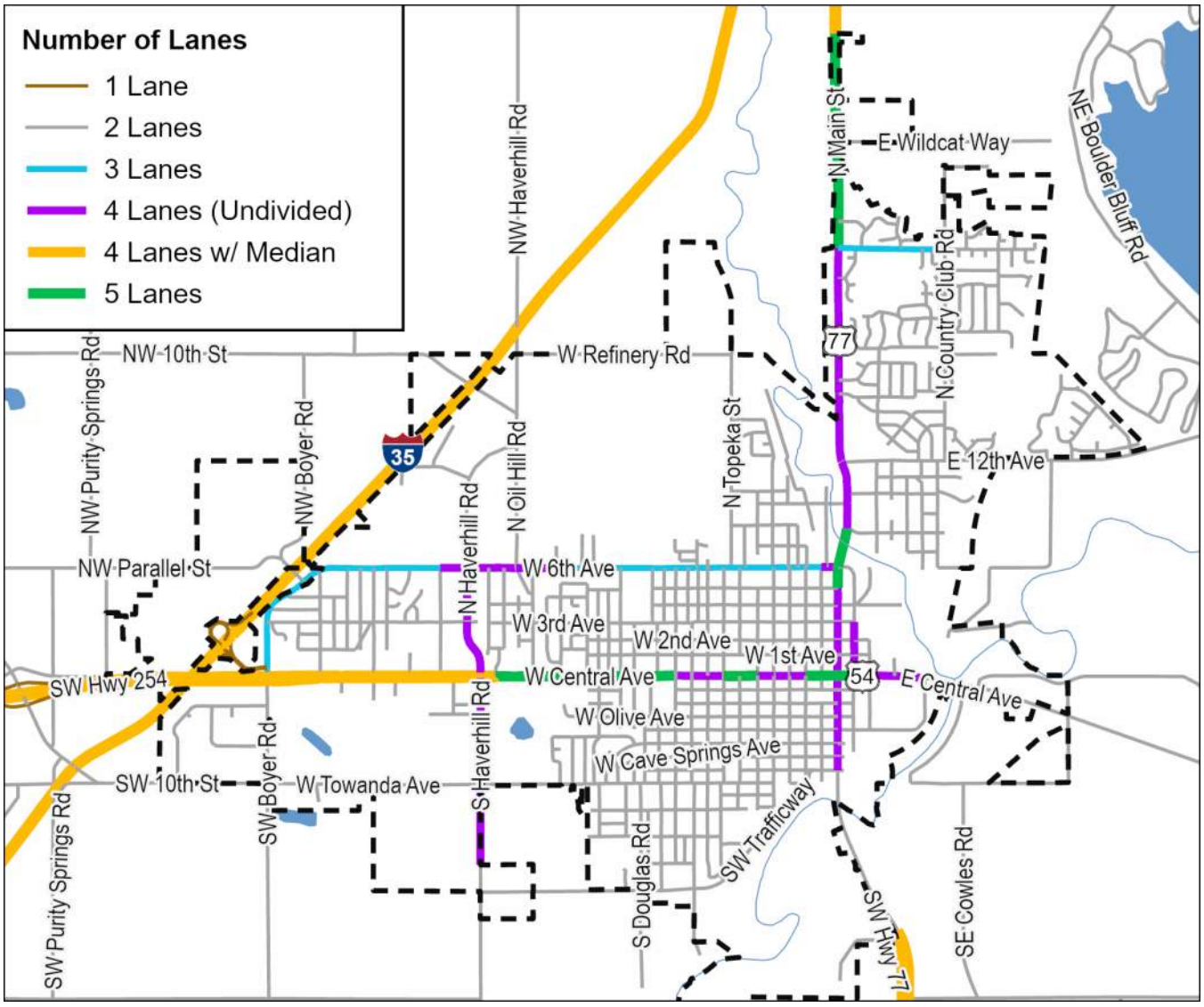


Figure 9: Number of Lanes

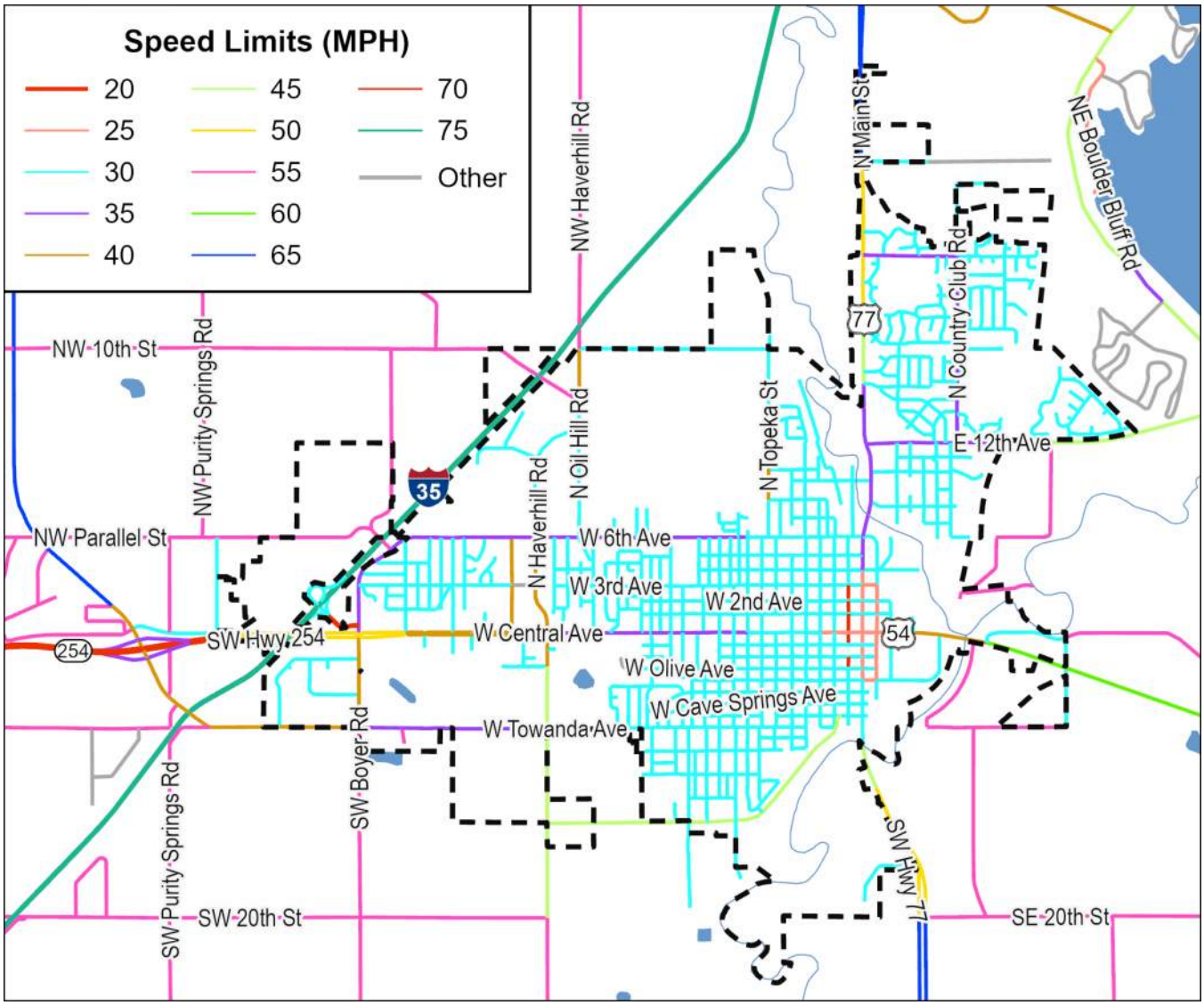


Figure 10: Speed Limits

Truck Routes

Truck routes Figure 11 have been established to keep trucks off the busier sections of Central Avenue and Main Street. StreetLight Data shown in Figure 12, shows most trucks following the truck routes. While not clearly displayed in Figure 12, the data does show some trucks on N Main Street between Central Avenue and 6th Avenue, but the volume is low compared to other streets.

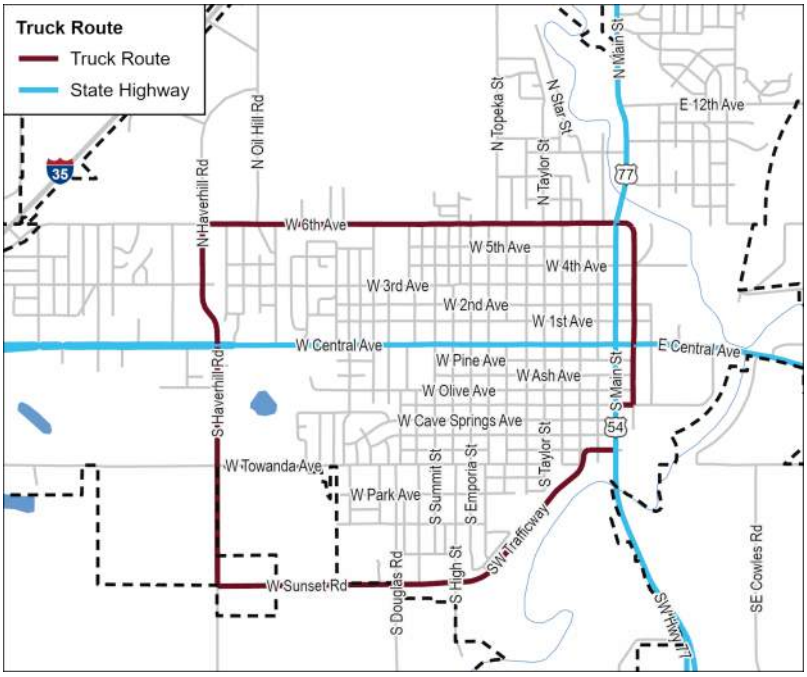


Figure 11: Truck Routes

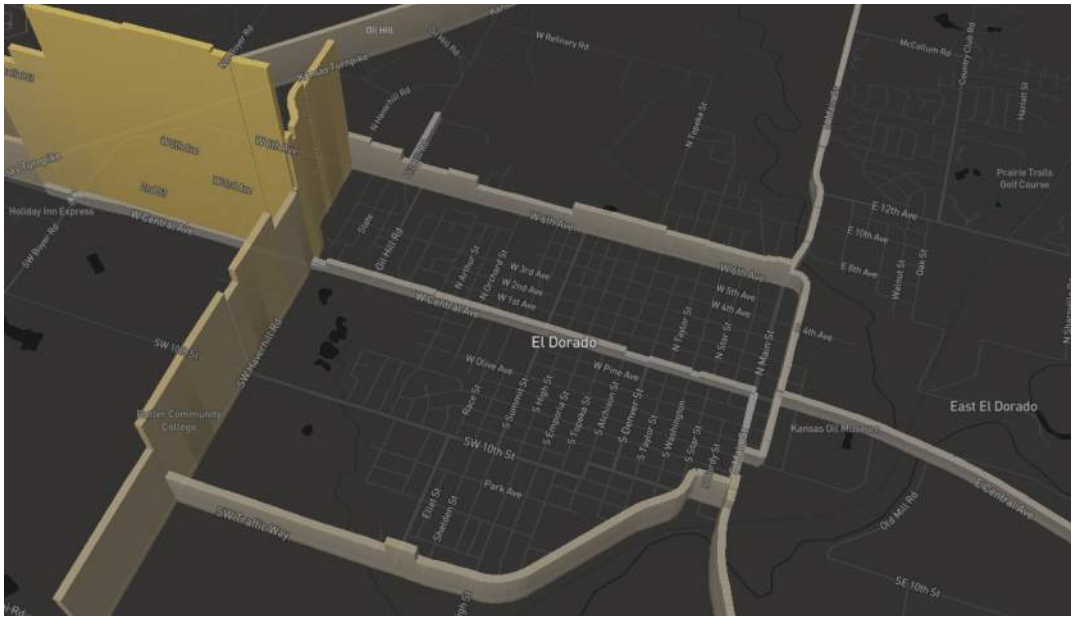


Figure 12: Truck Route StreetLight Data

Railroad Crossings

Railroad crossings on city streets are intersections where a railway line crosses a street at the same elevation as opposed to a grade-separated crossing where the railway line and the street are at different elevations (one crossing above the other). Traffic control at crossings can be passive or active. Passive crossings are controlled by signs and pavement markings. Active crossings use warning devices in addition to signs and pavement markings including flashing beacons, audible warnings, and in some cases, gates that lower to block the road when a train is approaching and present at the crossing. The map in Figure 13 shows the locations and types of railroad crossings in El Dorado.

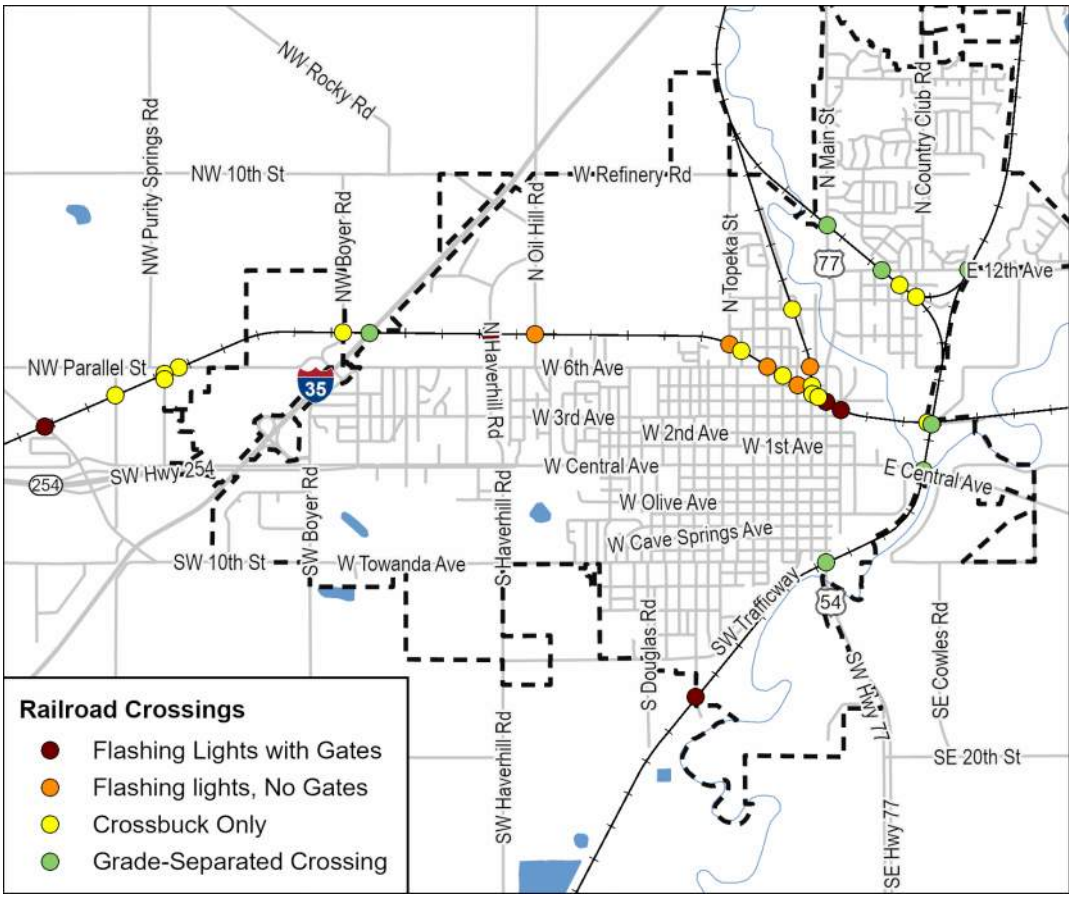


Figure 13: Railroad Crossings in El Dorado

Trains at railroad crossings can significantly impact the movement of cars, trucks, and non-motorized traffic, affecting traffic flow, safety, and overall travel time. KDOT data from 2018 shows six trains per week on the Union Pacific railway that crosses 6th Avenue at Taylor Street and crosses Main Street at 4th Street. The BNSF railway along the east edge of the city carries 45 trains per day, but all crossings are grade separated. If train volumes remain the same, the delays to motorized and non-motorized traffic occurs infrequently. **A detailed safety evaluation of all railroad crossings is anticipated with the upcoming SS4A project.**

BIKEWAYS AND TRAILS NETWORK

Existing Facilities

Figures 14 and 15 show the existing bicycle facilities in and near El Dorado. Current facilities are aimed more at recreational use than use for transportation.

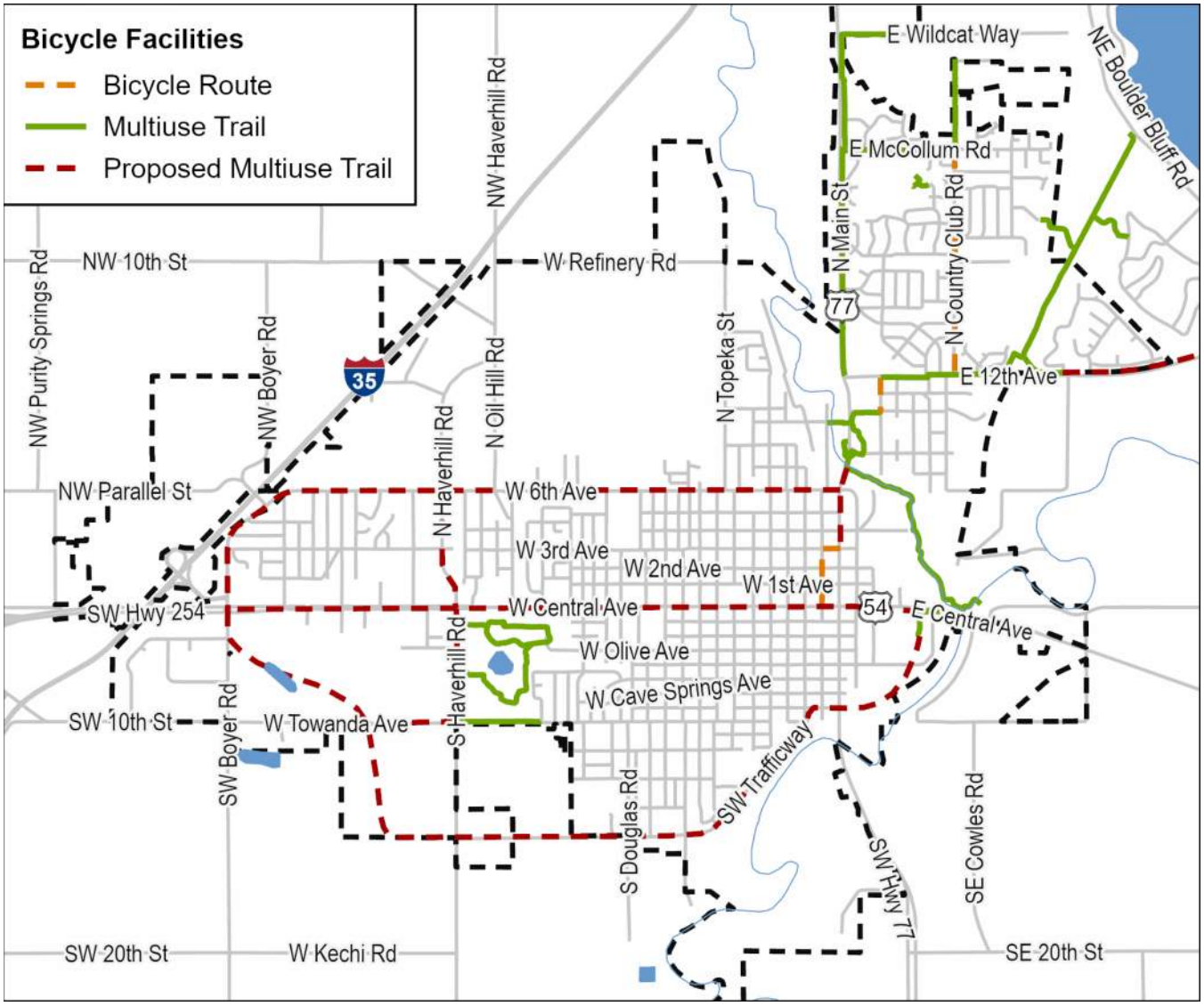


Figure 14: Bicycle Facilities

Figure 15 shows the existing facilities around El Dorado Lake with additional facilities being constructed every year.

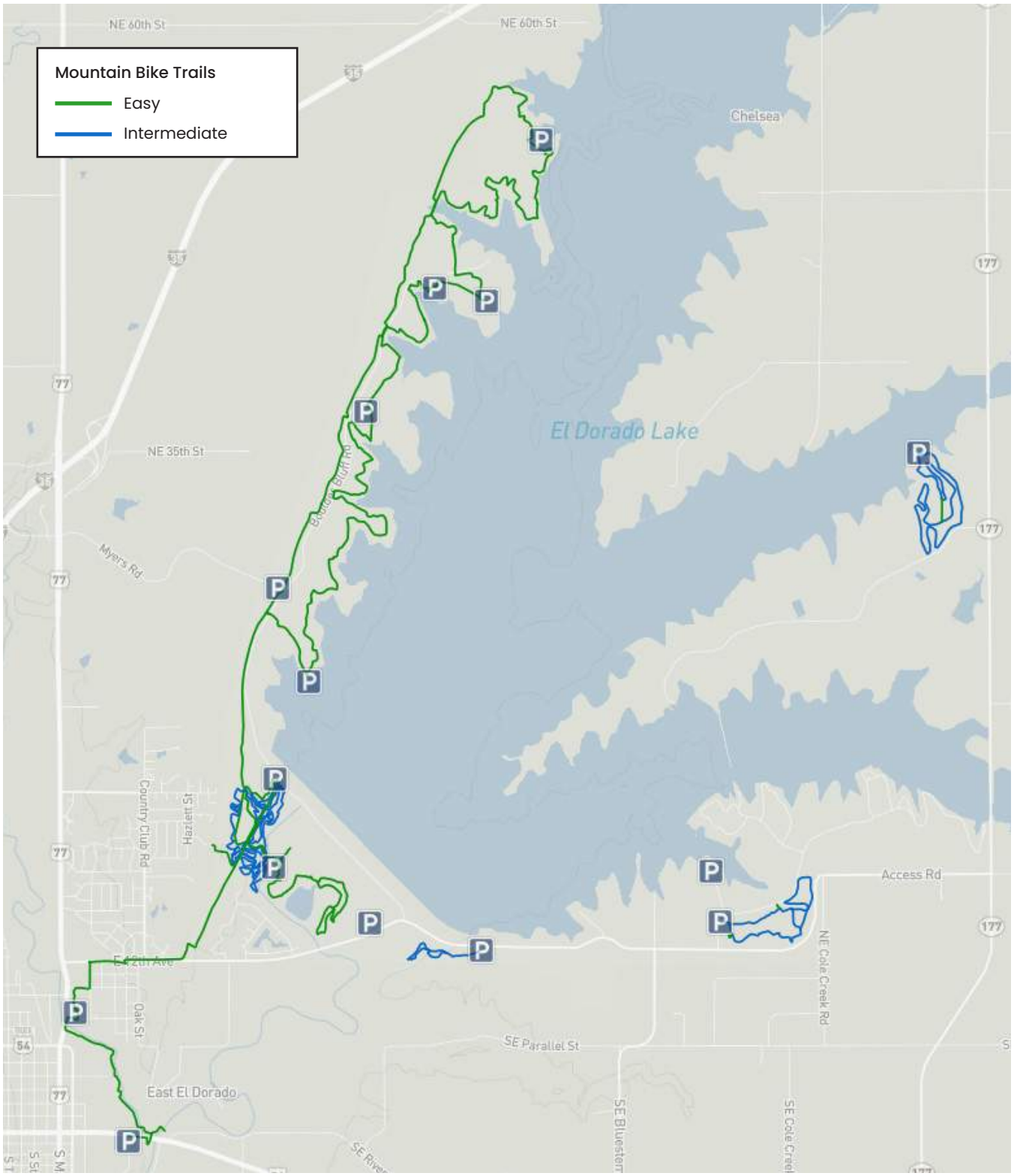


Figure 15: Bicycle Facilities at El Dorado Lake

Bicycle Activity

Figure 16 shows a Strava heatmap for bicyclists in and near El Dorado. Strava is an application that allows cyclists to track their activities. Strava data does not show all bicyclists in the area, but it does provide valuable insights into cycling patterns and popular routes. The heatmap shows the usage of the trails at El Dorado Lake and the east-west movement of cyclists along Central Avenue (K-254) and to a lesser degree along 6th Avenue, 10th Street, and SW Traffic Way.

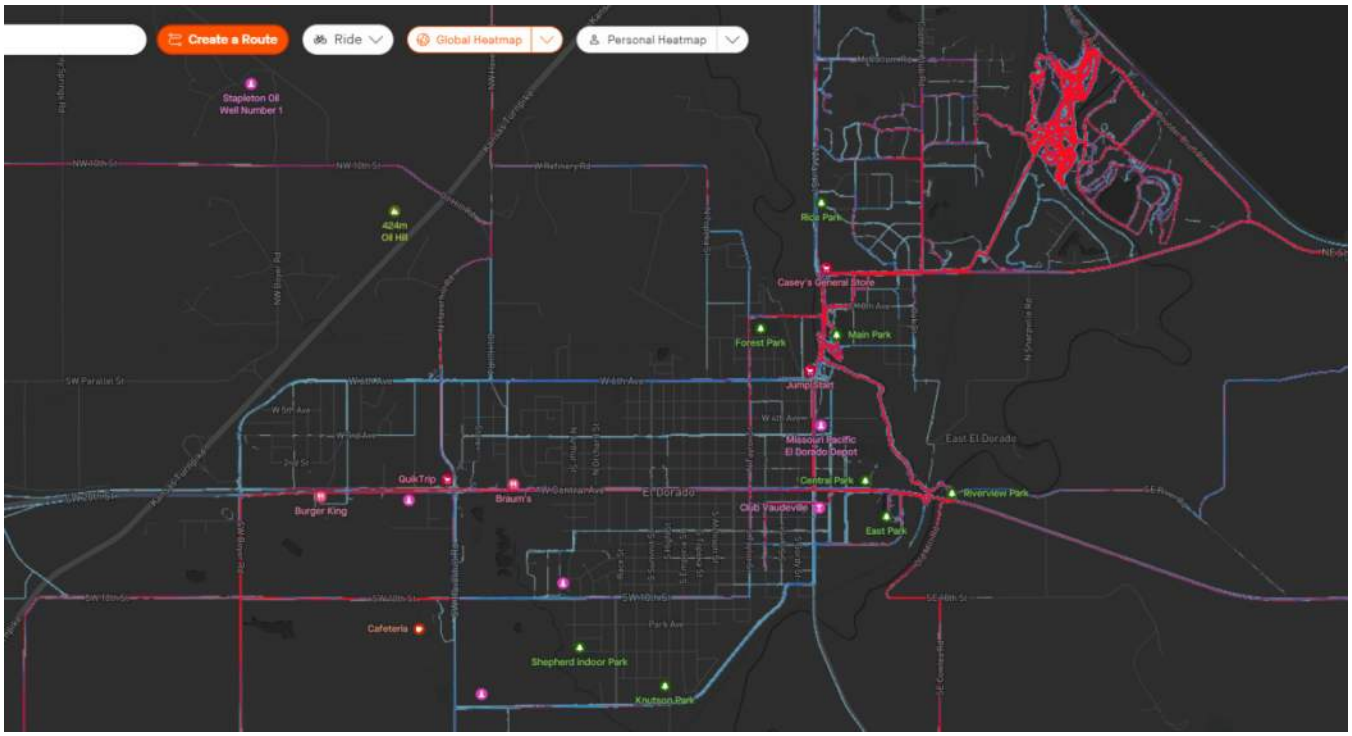


Figure 16: Strava Heatmap for Cycling Activities

SIDEWALK NETWORK

Figure 17 shows the existing network of sidewalks in El Dorado. Most streets within the core of the city have sidewalks, however the western and northern parts of the city are not well served by pedestrian facilities. Sidewalks are provided along major streets such as Central Avenue, 6th Avenue, and Main Street.

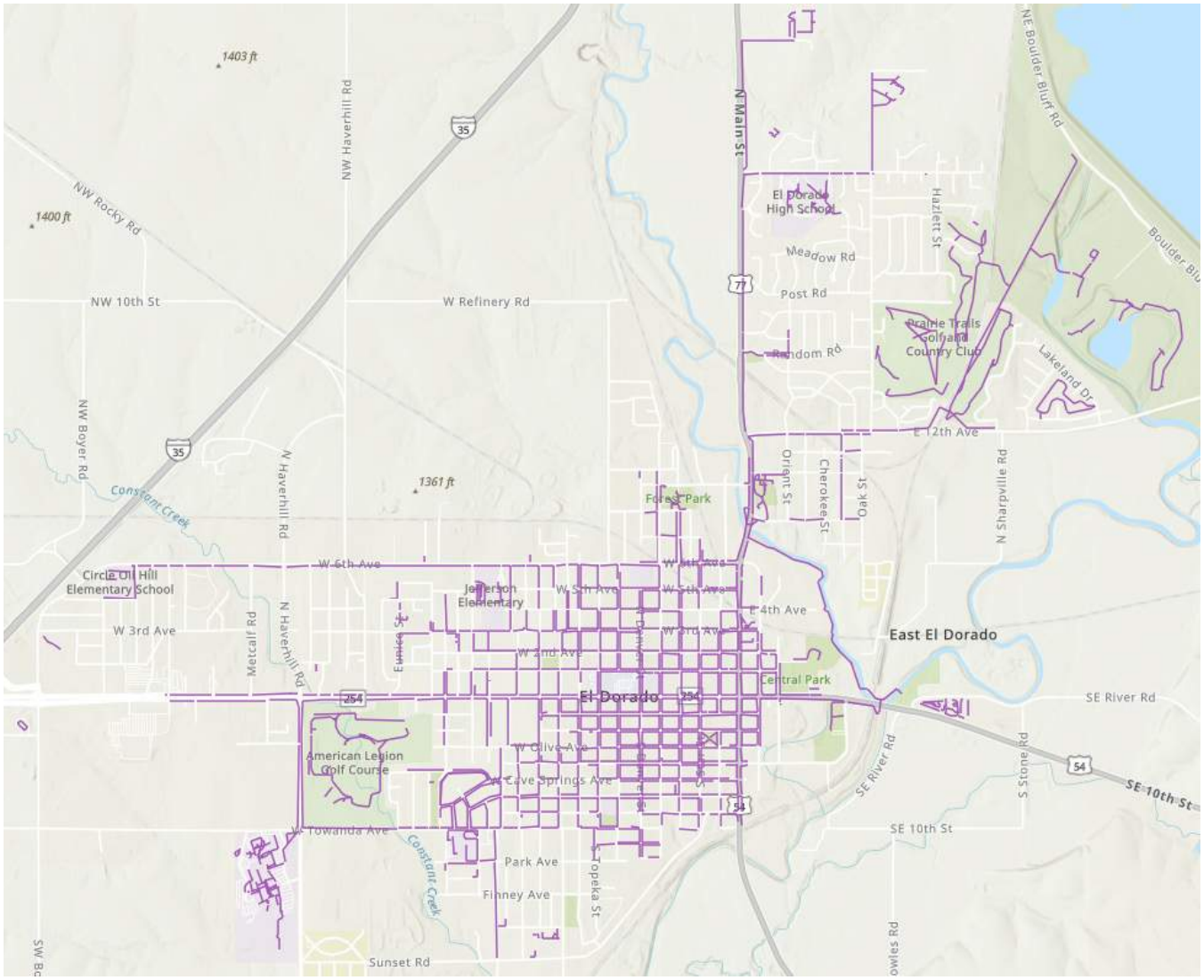


Figure 17: Sidewalk Network

El Dorado has a strong history of ensuring that public streets can be used by citizens with disabilities. PROWAG (Public Right-of-Way Accessibility Guidelines) were finalized in September of 2023, and was published under the Americans with Disabilities Act (ADA) and the Architectural Barriers Act (ABA). Continued investment should be made to bring untouched areas into compliance. While the time line for adoption by the U.S. Departments of Transportation and Justice remains undefined, PROWAG represents best practices and should be incorporated in current and future projects.

The City should consider eliminating its existing ordinance prohibiting bicycle traffic on sidewalks. There are locations and instances where it may be in the best interest of a bicyclist to use existing sidewalks.

PEDESTRIAN ACTIVITY

Figure 18 shows a Strava heatmap for pedestrians in El Dorado. Strava is an application that allows walkers/runners to track their activities. Strava data does not show all foot traffic in the area, but it does provide valuable insights into patterns and popular routes. The heatmap shows the pedestrian usage of the sidewalks and streets throughout the city.

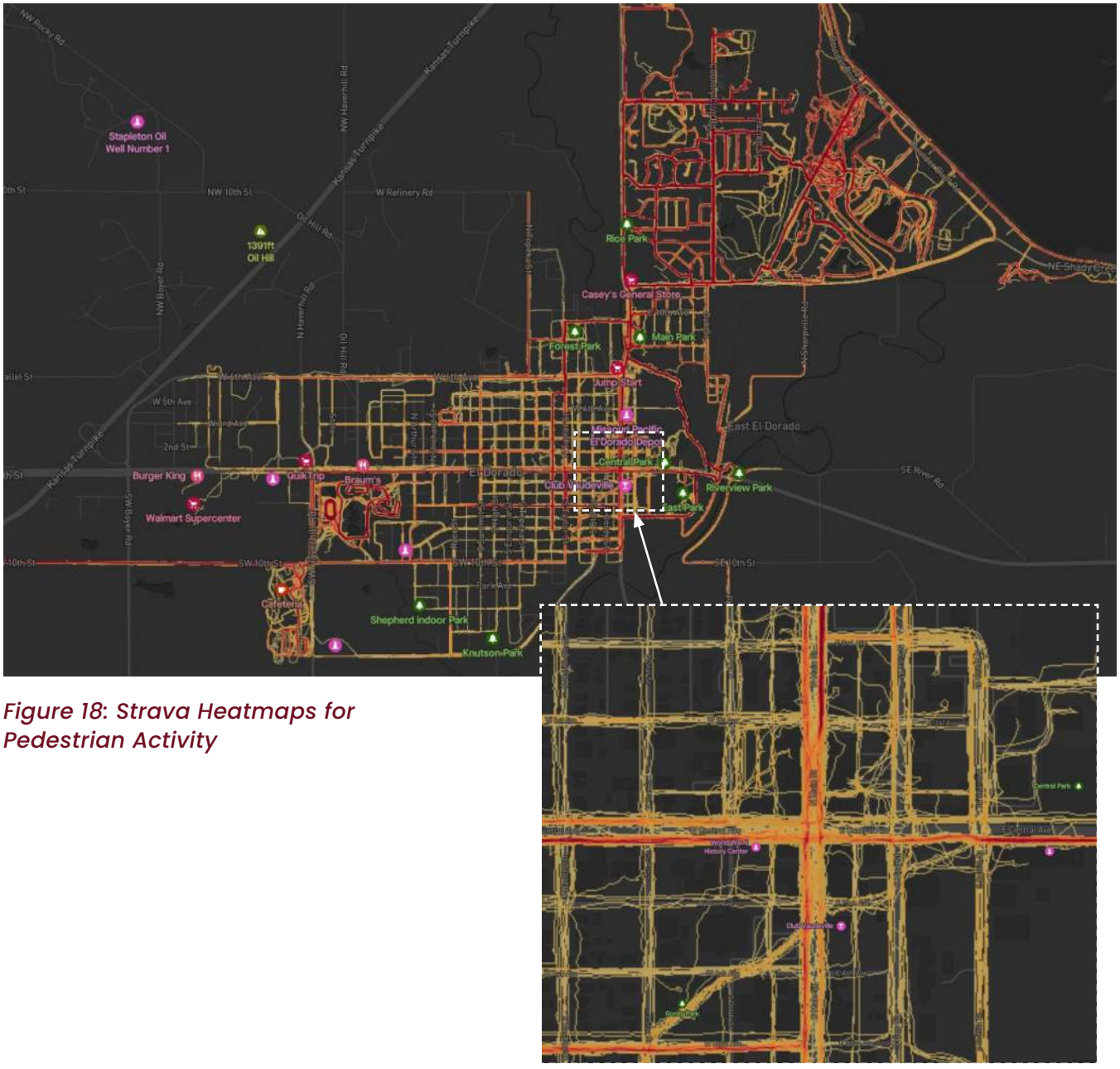


Figure 18: Strava Heatmaps for Pedestrian Activity

Downtown El Dorado

TRANSIT SERVICE

The Butler County Transit Program through the Butler County Department on Aging is a general public transportation program that offers a variety of routes throughout the county. Vehicles offer curb-to-curb service, Monday through Friday from 9:00 AM to 3:00 PM. Service is available to anyone of any age. The program serves many destinations including medical appointments, grocery stores, and apartment complexes. Rides are typically scheduled 24 hours in advance of needing the ride.

SECTION 6

Current & Future Transportation Operations

CURRENT & FUTURE TRANSPORTATION OPERATIONS

This section documents current and future traffic operations in the City of El Dorado.

Average daily traffic (ADT) volumes were obtained from the KDOT website. The ADT map for the City of El Dorado was published in 2022.

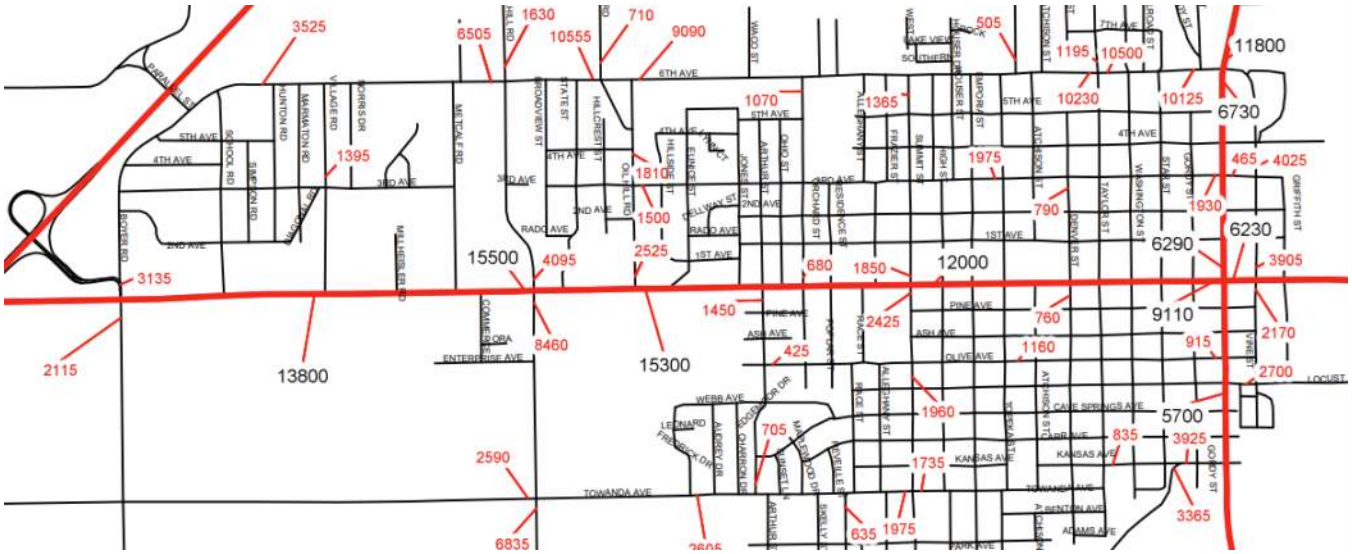


Figure 19: Average Daily Traffic Volumes

Traffic counts were collected using MioVision cameras in September 2023 at four intersections: Central Avenue and Boyer Road, Central Avenue and Haverhill Road, Central Avenue and Main Street, and Main Street and 6th Avenue. These counts showed reasonable correlation to the data that was obtained from StreetLight Data for the entire city. StreetLight Data uses a variety of sources, including anonymized location data from mobile devices, GPS devices, and other sensors. This data is aggregated and analyzed to provide insight into the volume of traffic on roads and streets. This data can be broken down by various time intervals, such as hourly, daily, or monthly, allowing for detailed analysis of traffic patterns and trends. ADTs from the StreetLight Data are shown in Figures 20, 21, and 22 for Central Avenue, 6th Avenue, and Main Street.

K-254/ CENTRAL AVENUE

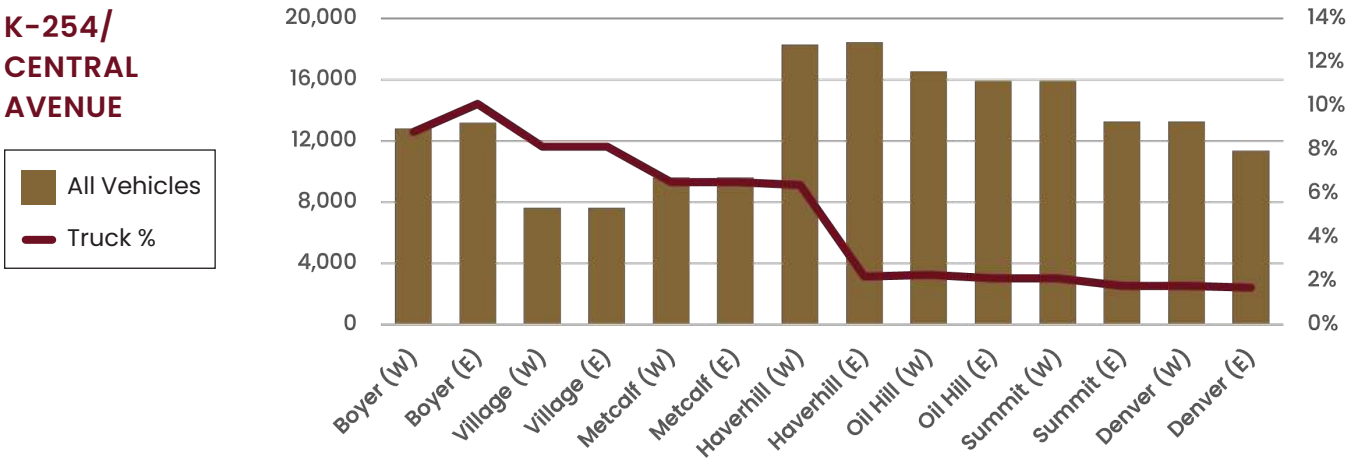


Figure 20: K-254/Central Avenue Average Daily Traffic Volume

W 6TH STREET

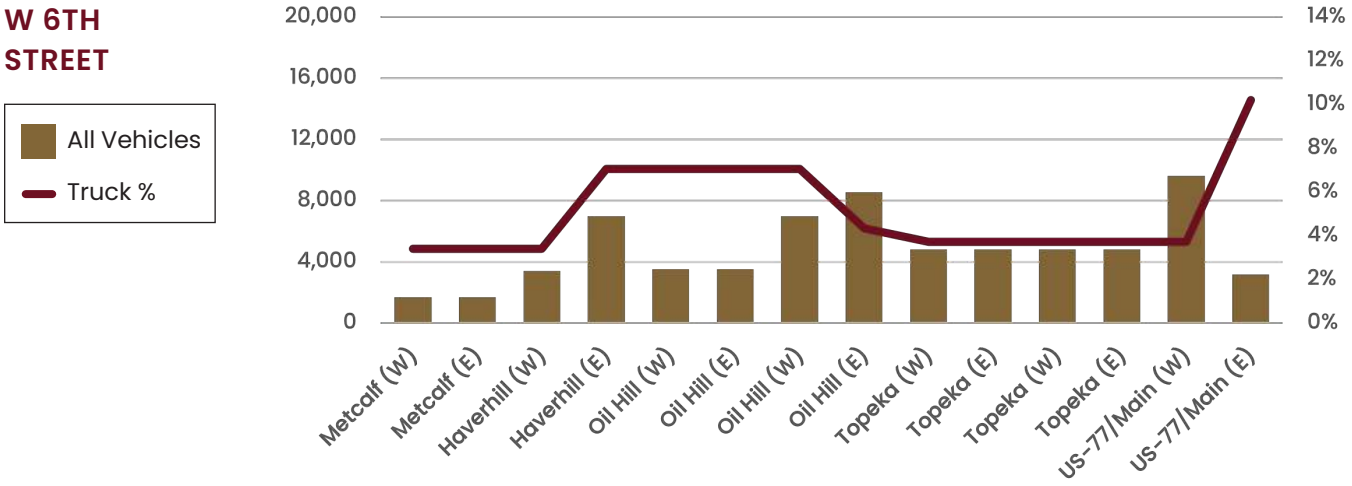


Figure 21: W 6th Street Average Daily Traffic Volume

U.S. 77/MAIN STREET

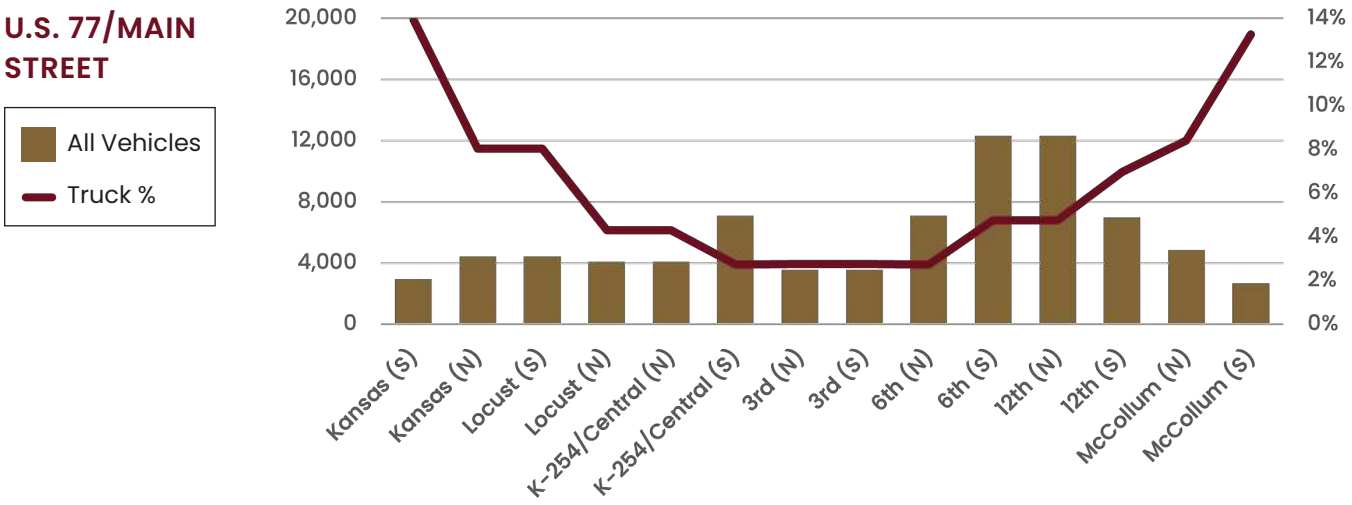


Figure 22: U.S. 77/Main Street Average Daily Traffic Volume

ROADWAY CAPACITY/LEVEL OF SERVICE

Traffic-carrying capacity and the level of service provide guidance to plan for the number of lanes needed on a street or highway.

The **capacity** of a street refers to the maximum number of vehicles that can pass a given point on the roadway within a specified timeframe. For example, a four-lane arterial street (two through lanes in each direction) can carry up to 40,000 vehicles per day (vpd).

Levels of Service (LOS) for an arterial street are defined by the Highway Capacity Manual (HCM) and describe the operational conditions in terms of speed, travel time, freedom to maneuver, traffic interruptions, and comfort. The LOS is graded from A to F, with A representing the best operating conditions (excellent flow conditions) and F representing the worst (severe congestion and poor flow quality). LOS A through D is typically considered acceptable for most urban and suburban planning purposes, while E and F indicate severe congestion and the need for significant improvements.

EXISTING TRAFFIC OPERATIONS

The number of travel lanes on the city's arterial and collector streets are adequate to carry existing traffic volumes. The highest daily traffic volume on Central Avenue (K-254) is 15,500 vpd and the highest volume on Main Street (US-77) is 11,800 vpd. Both streets are well under the traffic volume that would indicate a need to widen these streets. 6th Avenue carries up to 10,000 vpd, which is under the capacity of a 3-lane roadway.

The traffic volumes were obtained from KDOT traffic count maps, traffic counts at key intersections, and through StreetLight Data. Average volumes for the school year, fall 2021 through spring 2022, were used for analysis as these appeared to be the peak travel times of the year within the city.

Figure 23 illustrates that the StreetLight Data information was defined for each of 12 zones or areas in the city. StreetLight data for all zones can be found in Appendix B. Inbound traffic to zones 4 and 9 is shown as an example. StreetLight Data was used to determine peak hour turning movement volumes for key intersections.

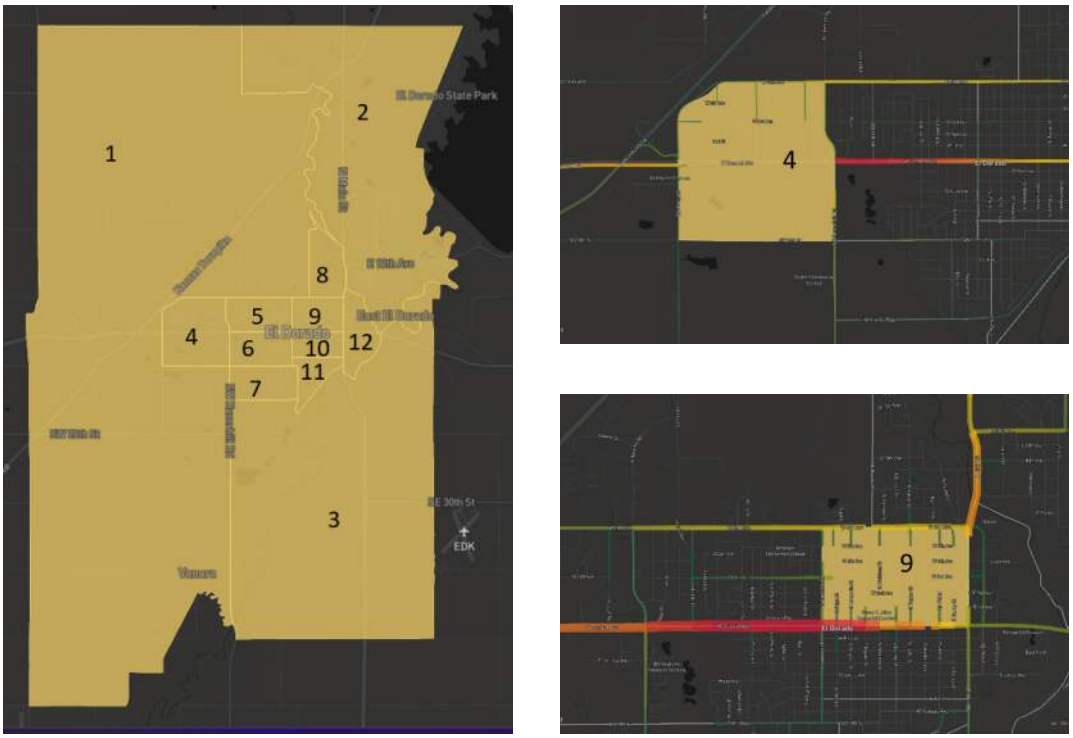


Figure 23: Inbound Traffic by Zone

For intersections with traffic signals, LOS is defined in terms of the average control delay per vehicle which includes deceleration upon arrival, stopped time in the queue, queue movement, and acceleration upon departure.

LOS	Average Delay (sec)	Description
A	<10	Very little delay. Free-flow conditions with minimal interruption.
B	>10 to 20	Short delays. Stable flow with slight but noticeable delay.
C	>20 to 35	Moderate delays. Stable flow but less freedom to maneuver. Intersections starting to get busy.
D	>35 to 55	Considerable delay. High-density flow with limited maneuverability. Driver comfort is reduced.
E	>55 to 80	Significant delays. Unstable flow. High congestion.
F	>80	Unacceptable delays. Breakdown flow. Traffic demand exceeds capacity.

Vehicle delays and minor congestion can be observed at intersections controlled by traffic signals. The existing PM peak hour traffic conditions were analyzed using the intersection traffic volumes shown in Figures 24, 26, and 28.

LOS analysis results for the PM peak hour are summarized in Figures 25, 27, and 29. All signalized intersections are operating at an acceptable level of service with current traffic volumes. One area of concern is the eastbound 6th Avenue approach to Main Street. The average delay on this leg of the intersection while currently a LOS D, is approaching LOS E which is unacceptable.

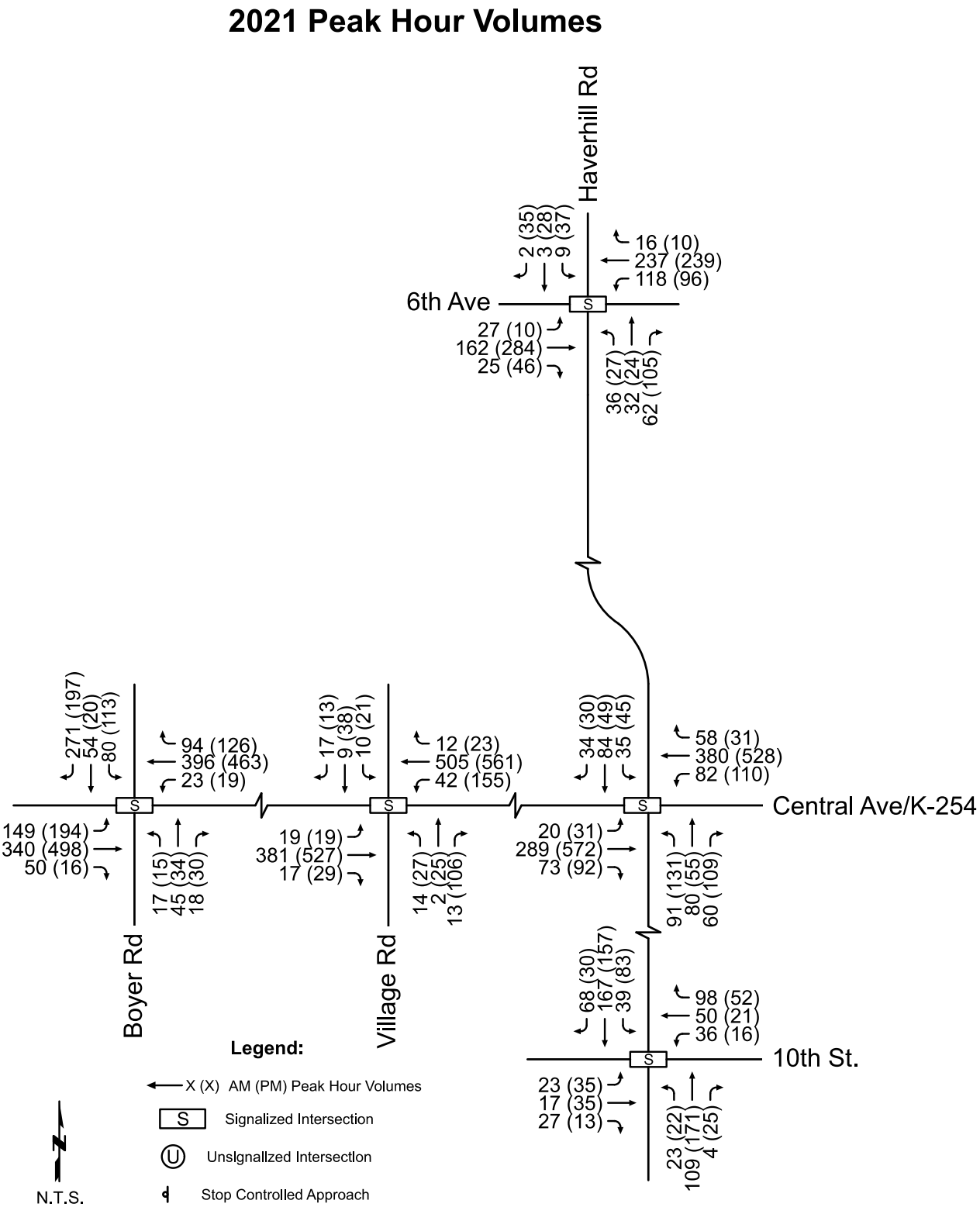


Figure 24: PM Peak Hour Traffic Volumes

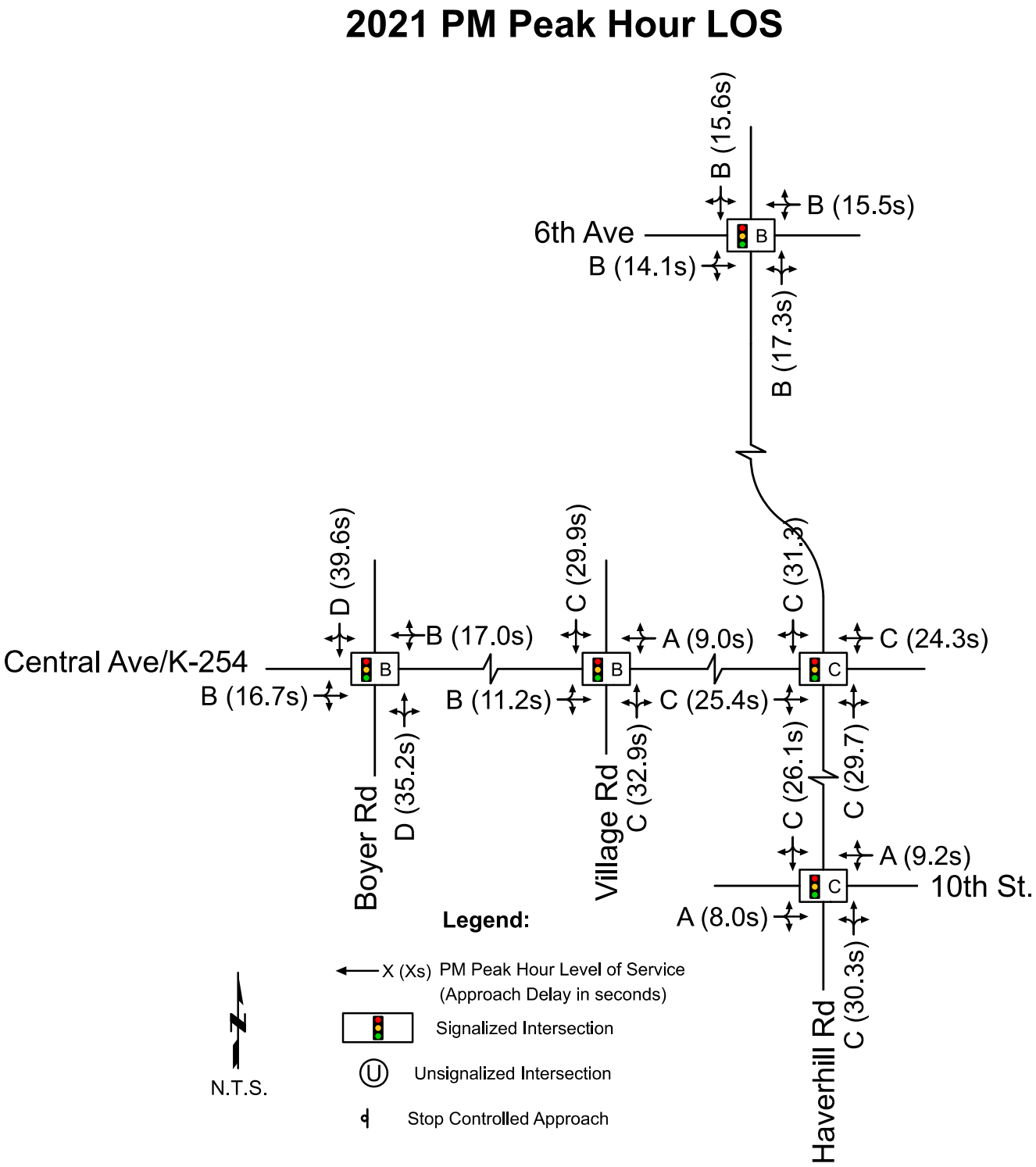


Figure 25: PM Peak Hour Level of Service

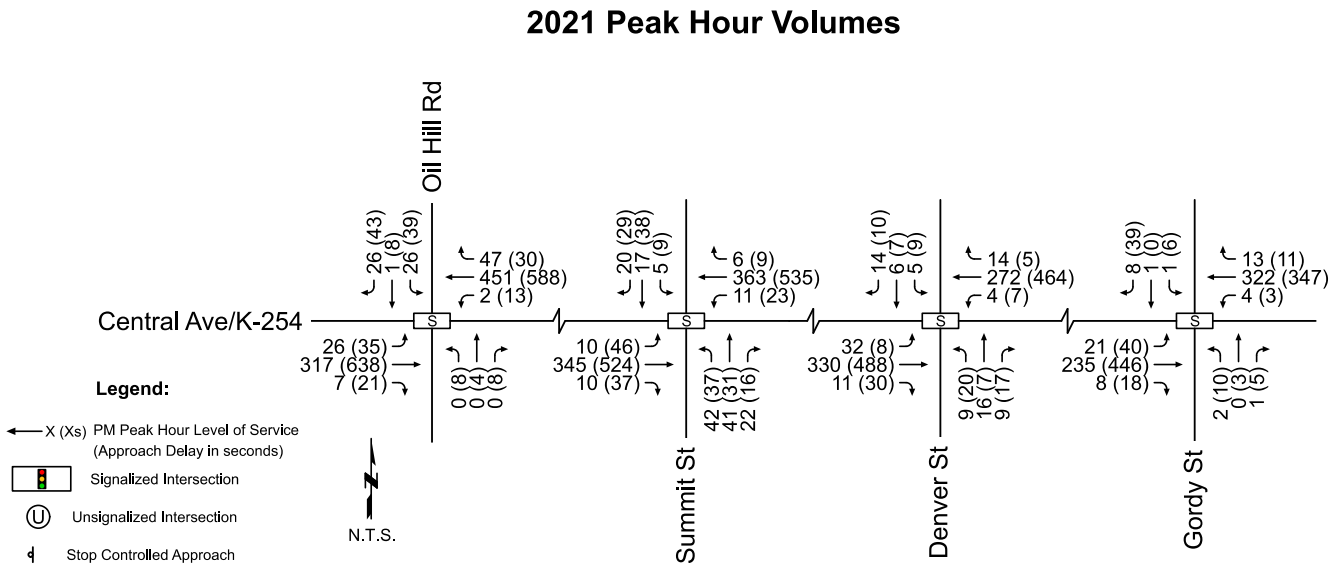


Figure 26: PM Peak Hour Traffic Volumes

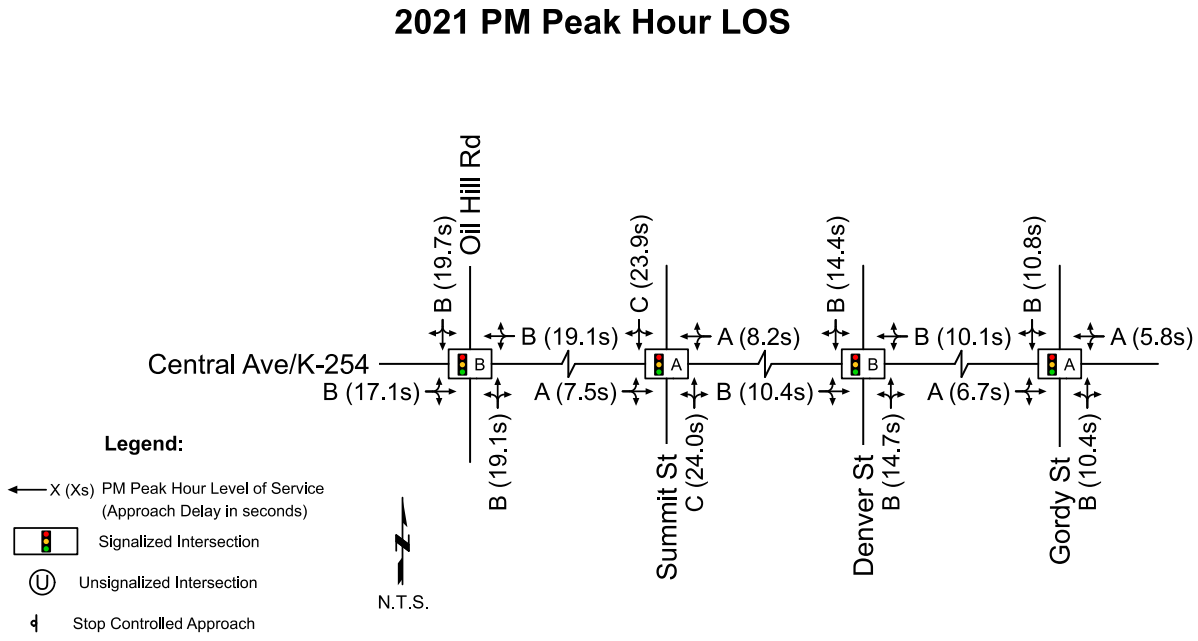


Figure 27: PM Peak Hour Level of Service

2021 Peak Hour Volumes

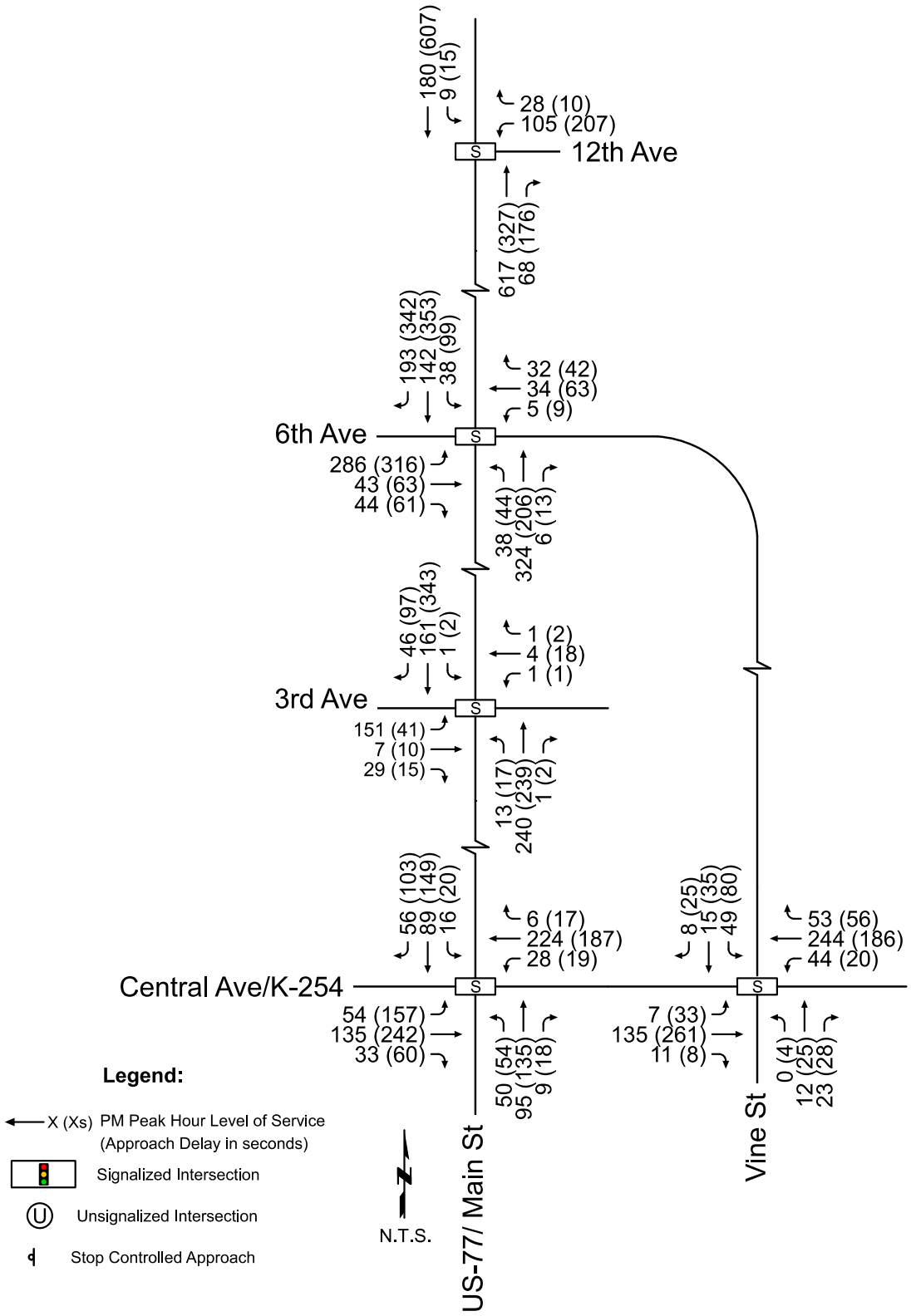


Figure 28: PM Peak Hour Traffic Volumes

2021 PM Peak Hour LOS

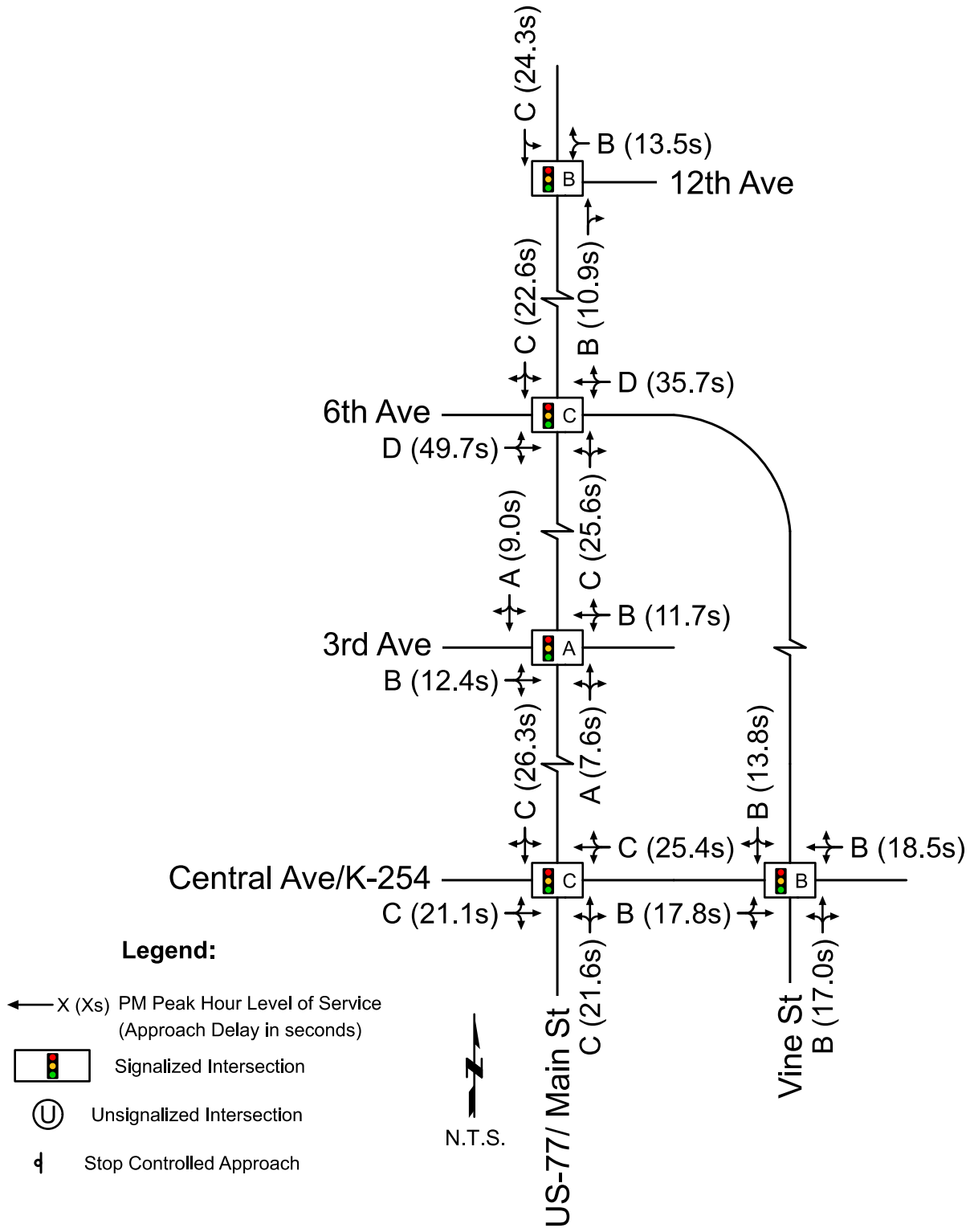


Figure 29: PM Peak Hour Level of Service

Based upon the results of the community survey, about one in three respondents experienced traffic congestion either daily or weekly in El Dorado.

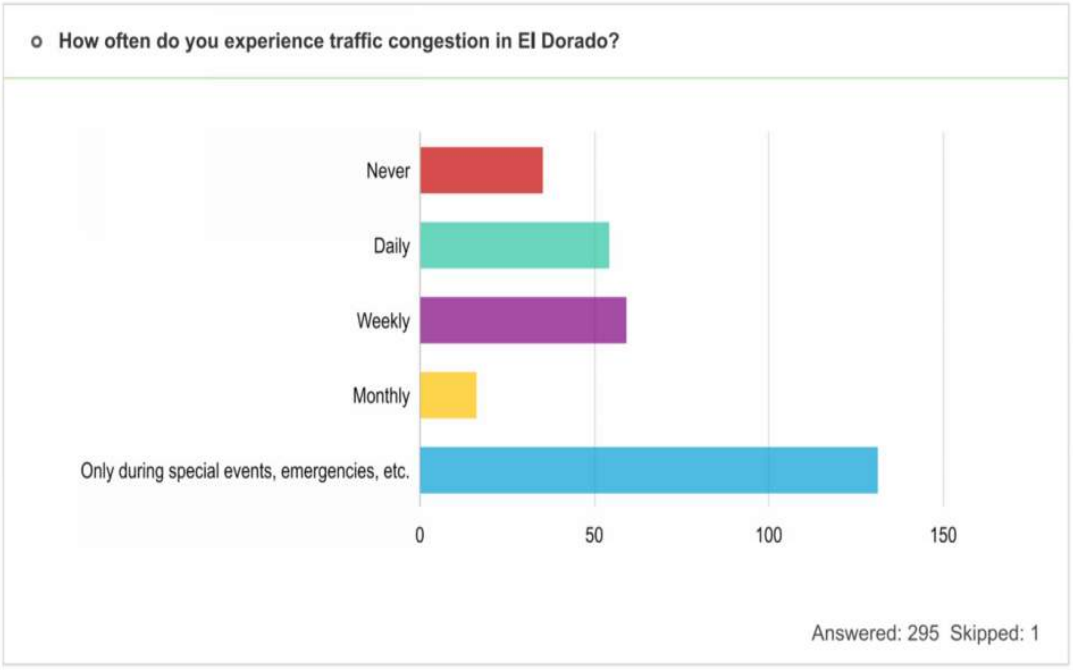


Figure 30: Frequency of Traffic Congestion Community Survey Results

FUTURE TRAFFIC OPERATIONS

Traffic Growth and Trip Generation

To determine the traffic growth rate of the city of El Dorado, traffic count maps from KDOT were analyzed and compared for every year between 2000 and 2022. Volumes were compared in various locations along K-254, US-77, and I-35. Over the last 20 years, it was observed that traffic growth has been steady but moderate. Since new development is anticipated to the north of the city, a growth rate of 0.5 percent was assumed and then trip generation was used to account for future traffic to and from the developments.

Trip generation was performed based on that used in a previous study of current and potential interchange locations on I-35. There were two parts to the trip generation for the current Transportation Study. The first assumes traffic will enter and exit the new developments from a new roadway that connects a potential interchange on I-35 near Refinery Road to the intersection of McCollum Road and US-77; the other trip generation assumes the rest of the traffic entering and exiting the development will use the existing streets that cross over the interstate and connect with 6th Avenue. The volumes were then distributed from the starting points of both trip generations to adjacent intersections based on the percent distribution of lefts, rights, and thru movements at each intersection until all trips exiting the development had been assigned. This process was then repeated for all trips entering the development.

The estimated future PM peak hour traffic volumes shown in Figures 31, 33, and 35.

LOS analysis results for the PM peak hour are summarized in Figures 32, 34, and 36. Most signalized intersections will operate at an acceptable level of service with future traffic volumes except for Main Street at 6th Avenue (LOS E) and Main Street at 12th Avenue. One other area of concern is the southbound Boyer Road approach to Central Avenue which is at LOS E. These three locations are identified as potential projects in the Recommended Transportation Plan section.

LOS	Average Delay (sec)	Description
A	<10	Very little delay. Free-flow conditions with minimal interruption.
B	>10 to 20	Short delays. Stable flow with slight but noticeable delay.
C	>20 to 35	Moderate delays. Stable flow but less freedom to maneuver. Intersections starting to get busy.
D	>35 to 55	Considerable delay. High-density flow with limited maneuverability. Driver comfort is reduced.
E	>55 to 80	Significant delays. Unstable flow. High congestion.
F	>80	Unacceptable delays. Breakdown flow. Traffic demand exceeds capacity.

2045 Peak Hour Volumes

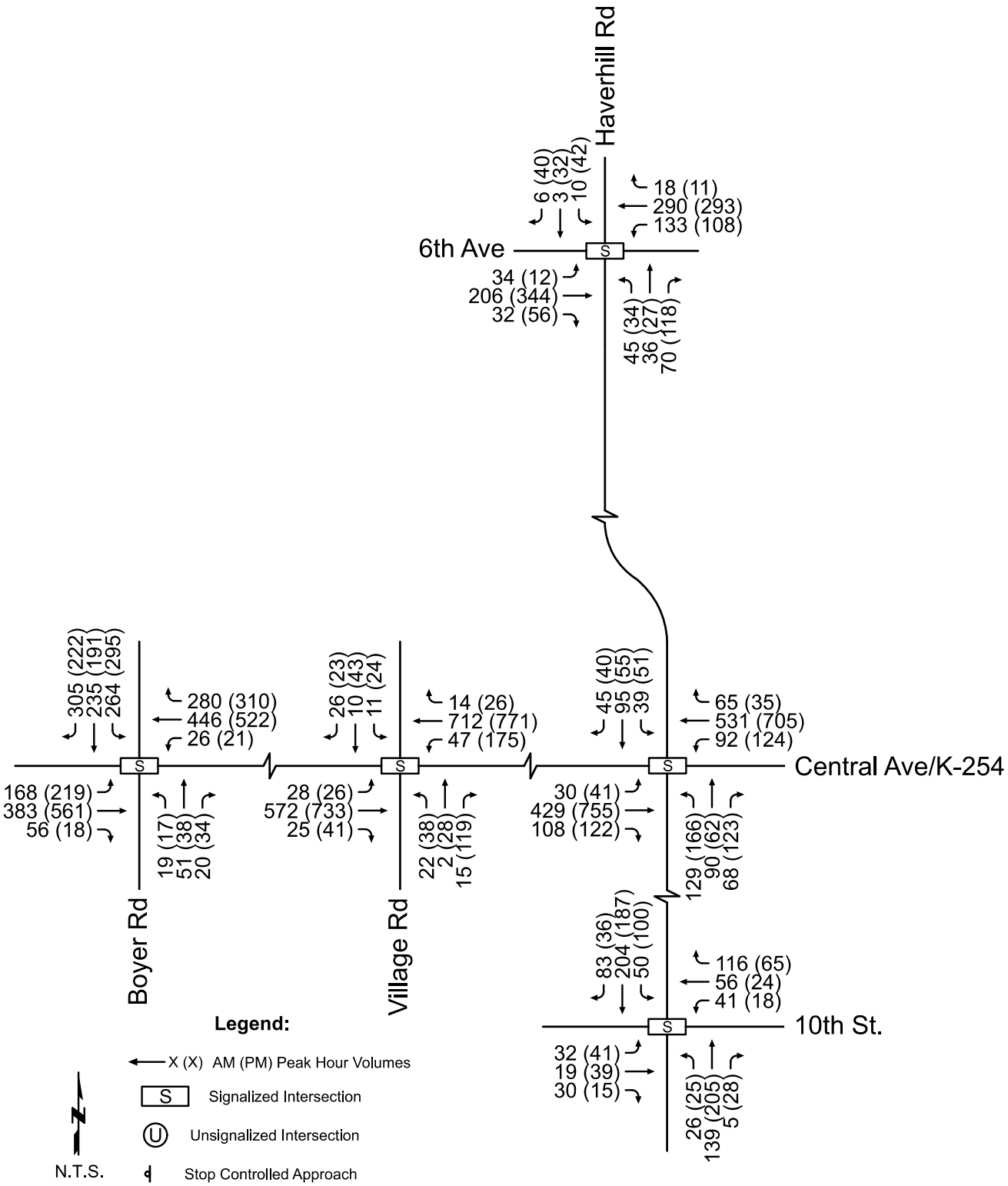


Figure 31: 2045 Peak Hour Volumes

2045 PM Peak Hour LOS

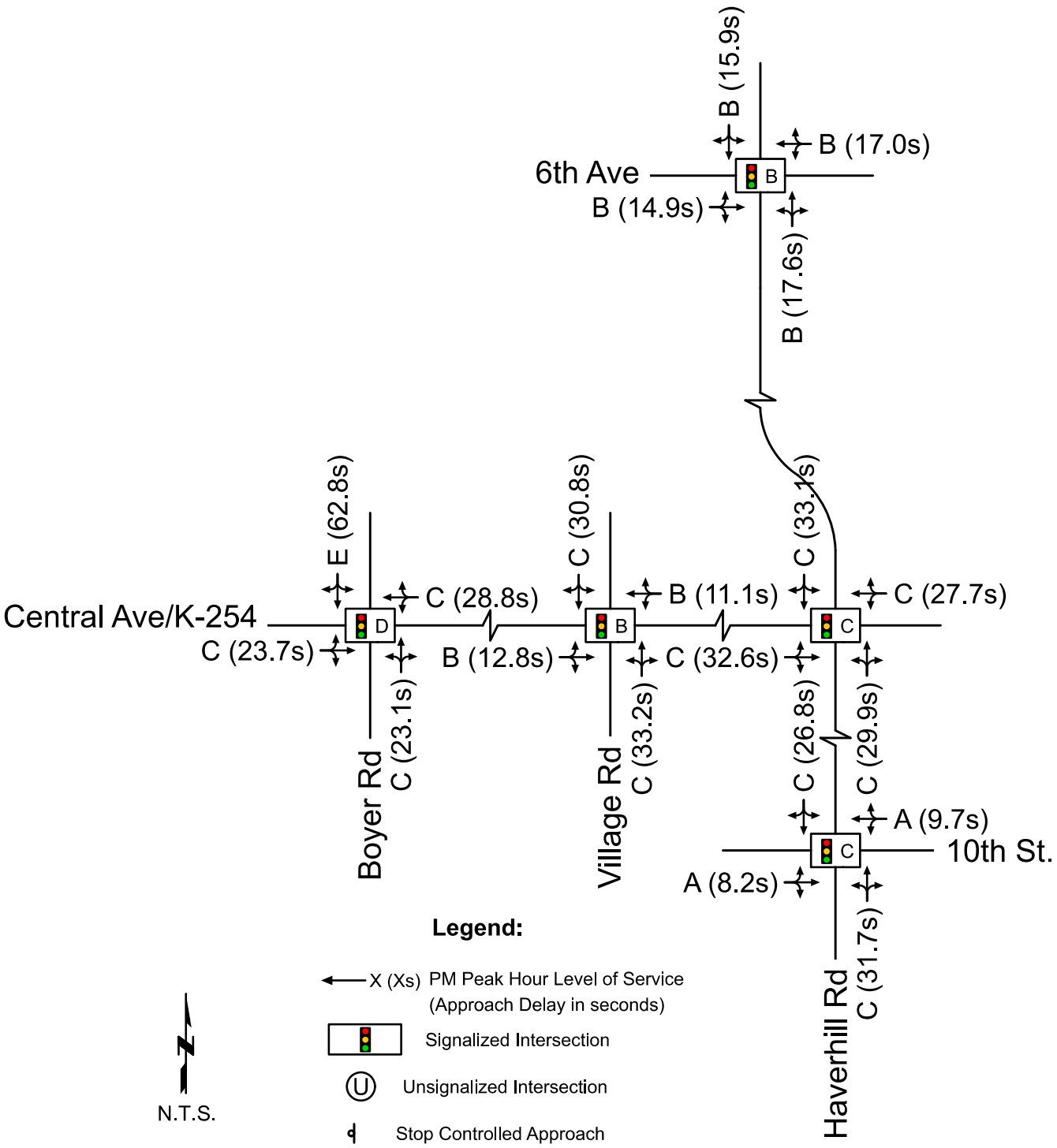


Figure 32: 2045 PM Peak Hour LOS

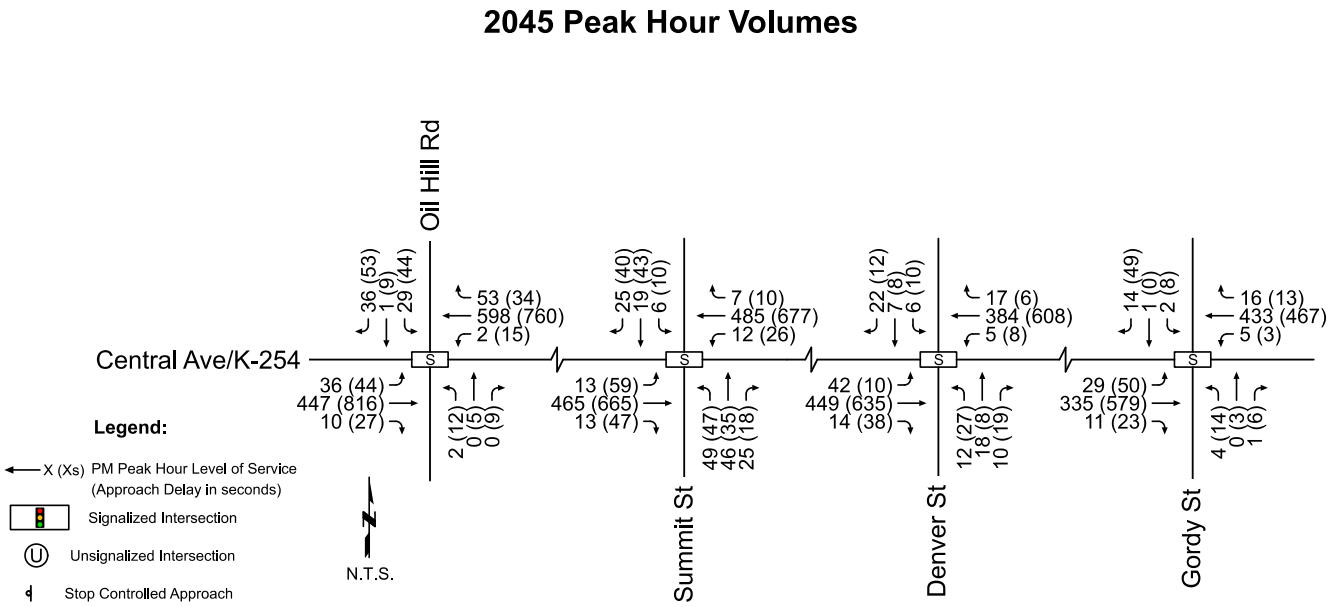


Figure 33: 2045 Peak Hour Volumes

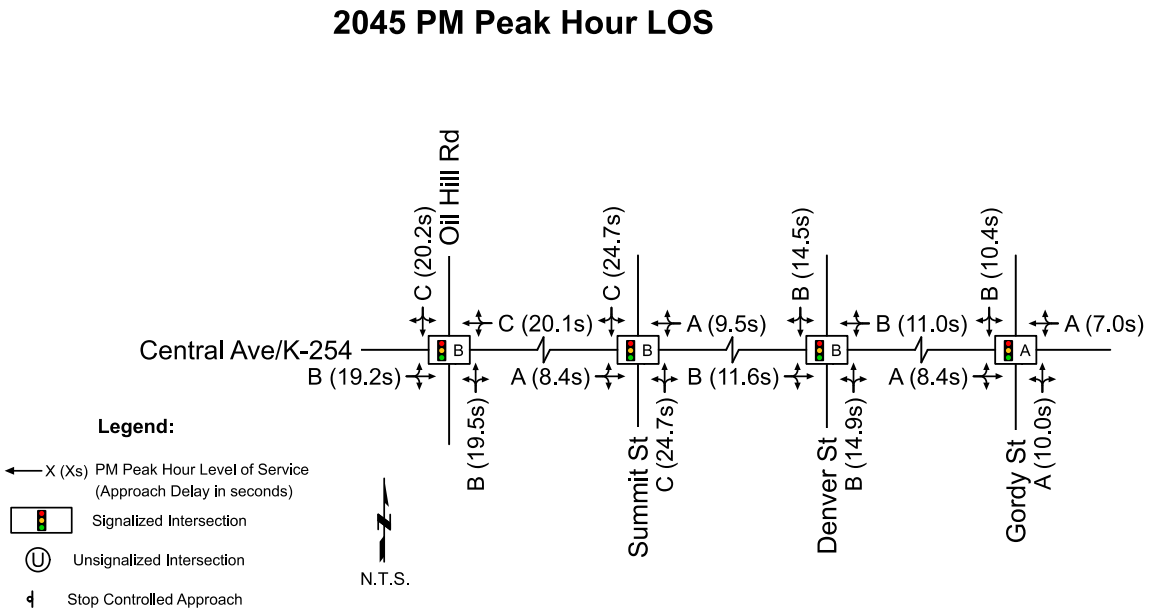


Figure 34: 2045 PM Peak Hour LOS

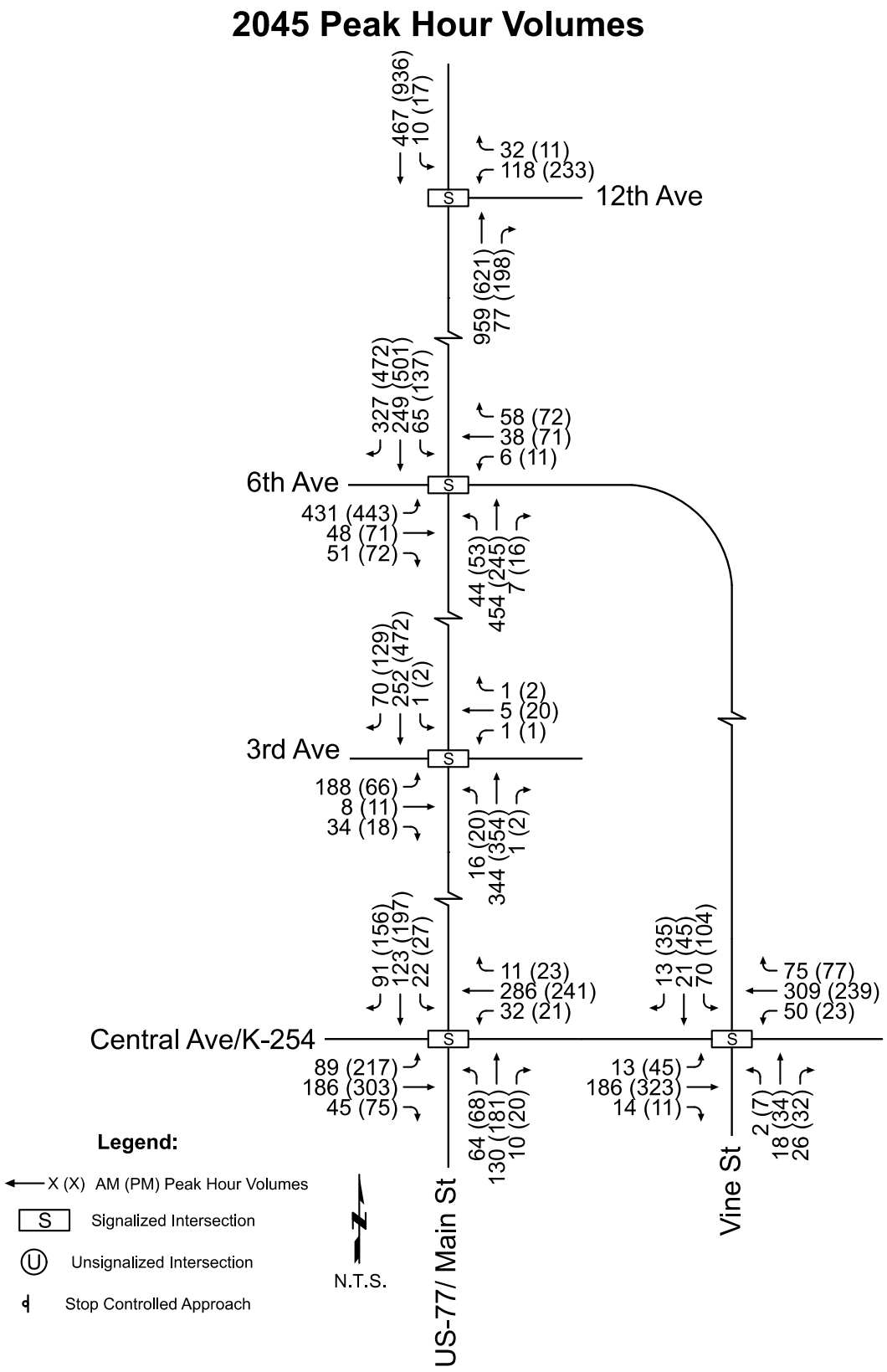


Figure 35: 2045 Peak Hour Volumes

2045 PM Peak Hour LOS

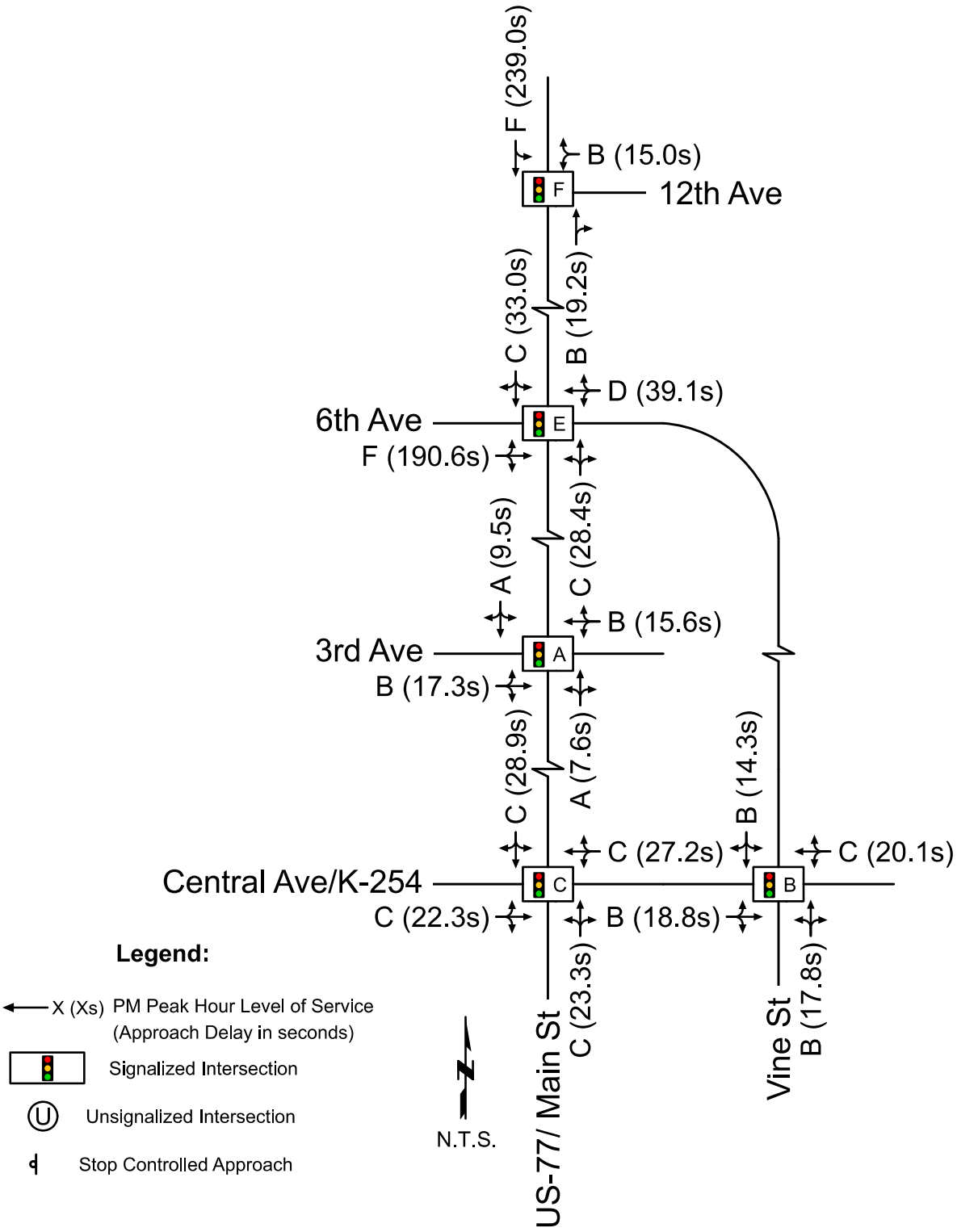


Figure 36: 2045 Peak Hour LOS

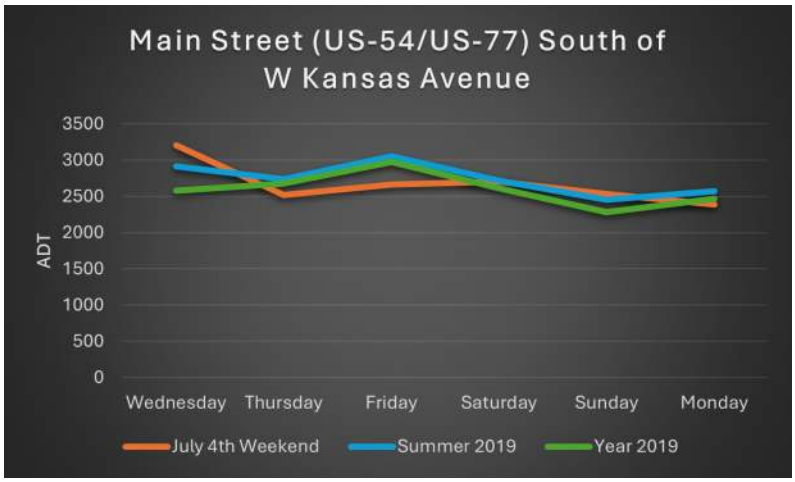
Impacts of Summer Traffic

The information from StreetLight Data for Summer of 2019 and School Year 2019-2020 (pre-COVID) was reviewed for several key intersections in the city. The results show traffic volumes in the summertime are slightly higher than traffic volumes during the school year. Intersections were analyzed on the three major routes: Central Avenue (K-254), Main Street (US-77), and 6th Avenue. On Central Avenue, AADTs were analyzed at Boyer Road, Haverhill Road, and Summit Street. Summer volumes were higher at all three intersections than the school year volumes by 1576 vehicles at Boyer Rd., 1299 vehicles at Haverhill Rd., and 1727 vehicles at Summit St. On Main Street, AADTs were analyzed at Central Avenue and 6th Avenue. Summer volumes were higher by 1763 vehicles at Central Avenue and 1097 vehicles at 6th Avenue. On 6th Avenue, AADTs were analyzed at Haverhill Road. Summer traffic volumes were 393 vehicles higher than the school year volumes. Results of the level of service analyses showed little differences between summer, school year, and full-year traffic.

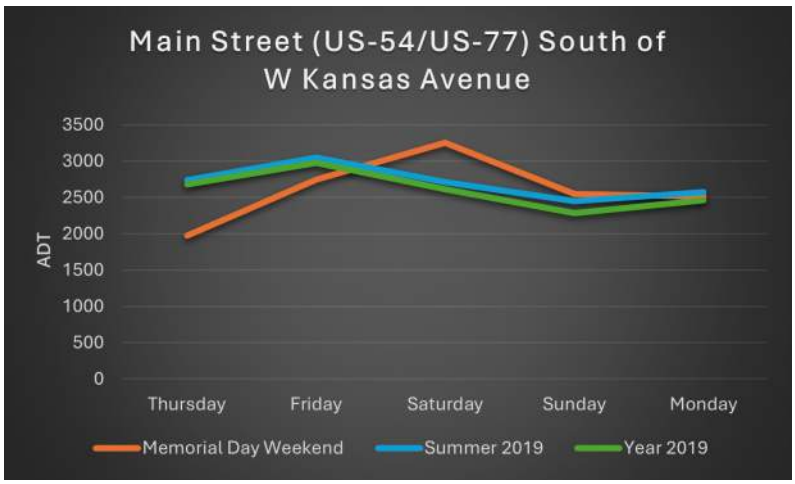
Impacts of Holiday Traffic

To analyze the impact of holiday traffic, StreetLight data was reviewed to compare the Average Daily Traffic (ADT) during the July 4th and Memorial Day holidays with a typical summer day and the yearly ADT averages for 2019. Since July 4th, 2019, fell on a Thursday, the analysis spanned from Wednesday through Monday. For Memorial Day weekend, traffic patterns were reviewed from the preceding Thursday through Monday. Data was collected at five key locations, and the findings are detailed below.

MAIN STREET (US-54/US-77) SOUTH OF W KANSAS AVENUE



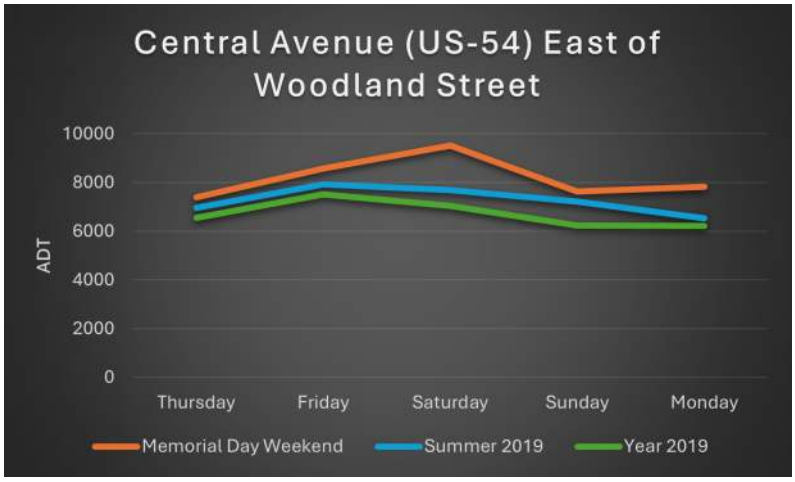
The **July 4th holiday** period showed traffic volumes on Main Street above summer and year-round average ADTs on Wednesday the 3rd. Volumes were lower than average on Thursday and Friday, then returned to near normal for Saturday through Monday.



During the **Memorial Day holiday** period, ADTs on Main Street for Thursday and Friday were lower than typical summer and yearly averages. Traffic volumes reached a peak on Saturday, 20% above average for summer and 25% above the yearly average.

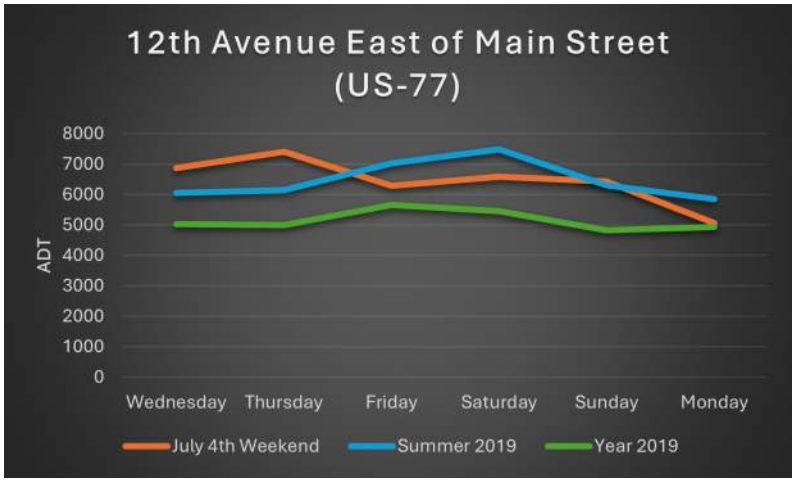
CENTRAL AVENUE (US-54) EAST OF WOODLAND STREET AT WALNUT RIVER

During the **July 4th holiday** period, traffic volumes on Central Avenue were observed to be 9% to 20% higher than typical summer levels on July 3rd, 4th, and 5th. When compared to yearly averages, traffic volumes exceeded expectations, ranging from 11% to 31% above the norm.

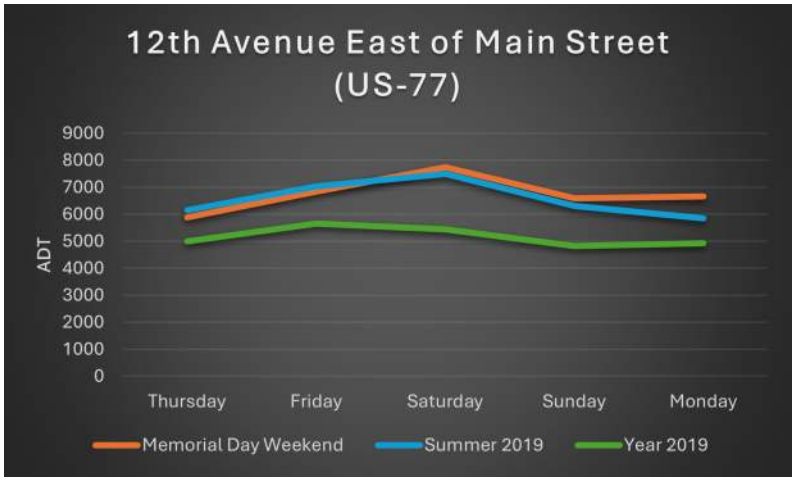


The **Memorial Day holiday** period on Central Avenue saw traffic volumes exceed yearly averages by 13% to 35% and summer levels by 6% to 24%. Saturday and Monday were the highest travel days during the holiday period.

12TH AVENUE EAST OF MAIN STREET (US-77)

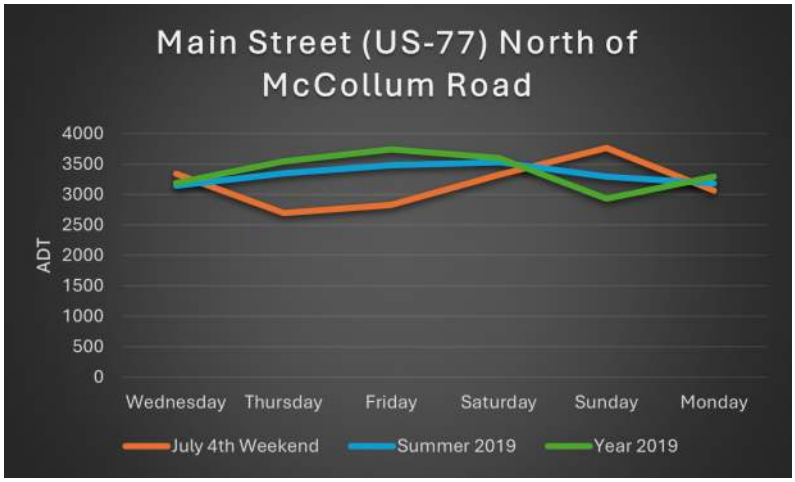


12th Avenue provides access to El Dorado Lake and camping areas. During the **July 4th holiday** period, traffic on 12th Avenue exceeded summer levels on Wednesday the 3rd and Thursday the 4th by 14% and 20% respectively. The rest of the holiday period was below summer norms.

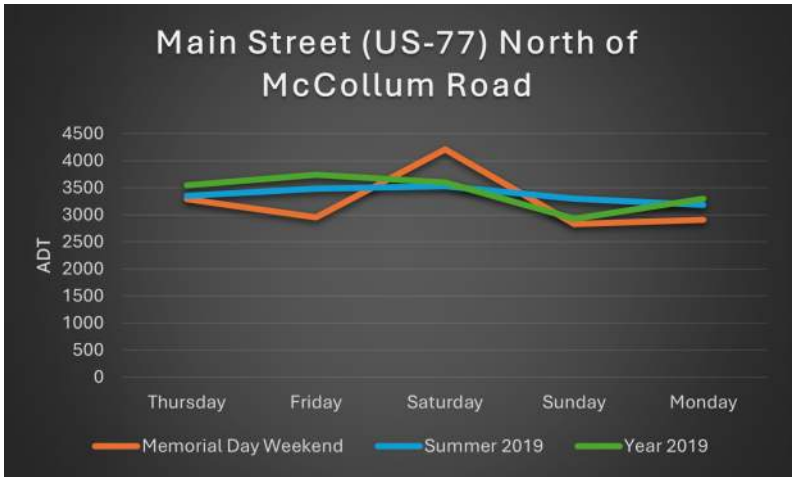


During the **Memorial Day holiday** period, traffic volumes on 12th Avenue were similar to normal summer levels. ADTs were 18% to 42% above yearly averages, understandable as this is the entrance to the lake and park area.

MAIN STREET (US-77), NORTH OF MCCOLLUM ROAD

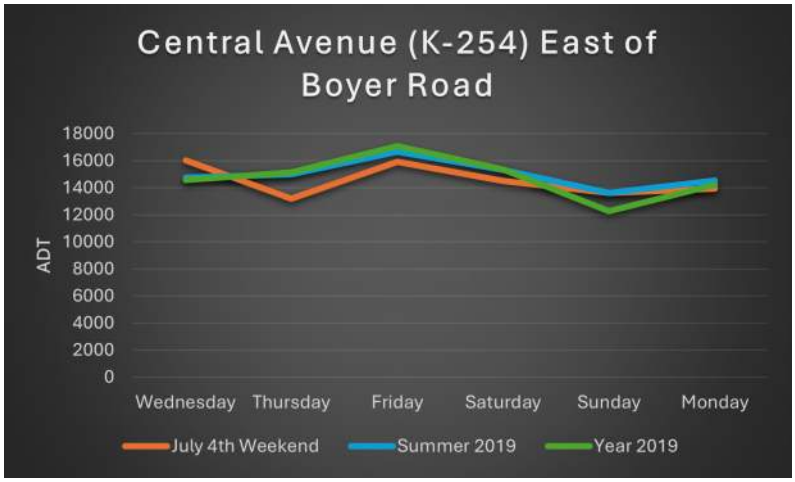


The **July 4th holiday** period showed traffic volumes on Main Street north of McCollum Road to be mostly below summer and yearly averages for the same days of the week.

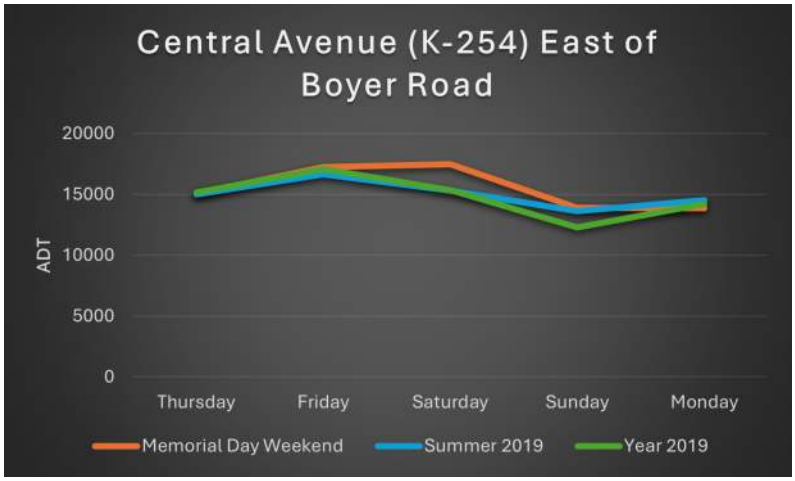


Memorial Day holiday traffic on Main Street in northern El Dorado was below summer and yearly averages except for the Saturday before Memorial Day which saw traffic volumes 17% to 19% above normal ADTs.

K-254, EAST OF SW BOYER ROAD



During the **July 4th holiday** period, traffic volumes on Central Avenue east of Boyer Road were observed to be higher than normal summer or yearly Wednesday traffic. The remainder of the holiday period traffic was less than normal.



Memorial Day holiday traffic on Central Avenue in western El Dorado exceeded summer and yearly averages on Friday, Saturday, and Sunday by up to 14%.

SECTION 7

Public Outreach & Participation

PUBLIC OUTREACH & PARTICIPATION

PUBLIC ENGAGEMENT PROCESS OVERVIEW

Stakeholder engagement was critical to ensure the transportation study update reflects the community's desires. It was essential that the community stakeholders were engaged in the planning process and have a sense of ownership in the final plan and recommendations. Engaged members will be able to see how their input resulted in the final plan, and the project team will be able to demonstrate to the city commission that the plan reflects community values and input. This ownership in the final plan helps ensure community members will be supportive during the implementation phase of projects.

A Public Involvement Plan (PIP) was developed at the beginning of the plan development process to identify the outreach efforts and techniques that would be appropriate to use to ensure officials, agencies, local government, the public and interested parties would have adequate opportunities to provide their input into the development of the Transportation Study. A copy of the PIP is included in the Appendices of this report.

LEVEL OF PUBLIC PARTICIPATION

The targeted level of participation was **consult**, as described in the International Association of Public Participation's (IAP2) Public Participation Spectrum. At this level, the project team worked to balance the priorities of the City and project stakeholders; however, final decision-making authority resided with the City.

Goal	**To obtain feedback on analysis, issues, alternatives, and decisions.**
Promise	**We will listen to and acknowledge your concerns and provide feedback on how input was used.**

Community engagement goals included:

- Provide all stakeholders with reasonable opportunities to provide feedback as the Transportation Study was developed.
- Ensure outreach tactics are easily accessible to all stakeholder groups.

Public Participation (P2) Approach

IAP2 SPECTRUM OF PUBLIC PARTICIPATION

INCREASING LEVEL OF PUBLIC IMPACT →

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Goal of Public Participation	To provide balanced and objective information in a timely manner.	To obtain feedback on analysis, issues, alternatives, and decisions.	To work with the public to make sure that concerns are considered and understood.	To partner with the public in each aspect of the decision-making.	To place final decision-making in the hands of the public.
Promise to the Public	"We will keep you informed."	"We will listen to and acknowledge your concerns, and provide feedback on how input was used."	"We will work with you to ensure your concerns are directly reflected in the decisions made."	"We will look to you for advice and incorporate this into the decisions as much as possible."	"We will implement what you decide."

Media and Community Outreach

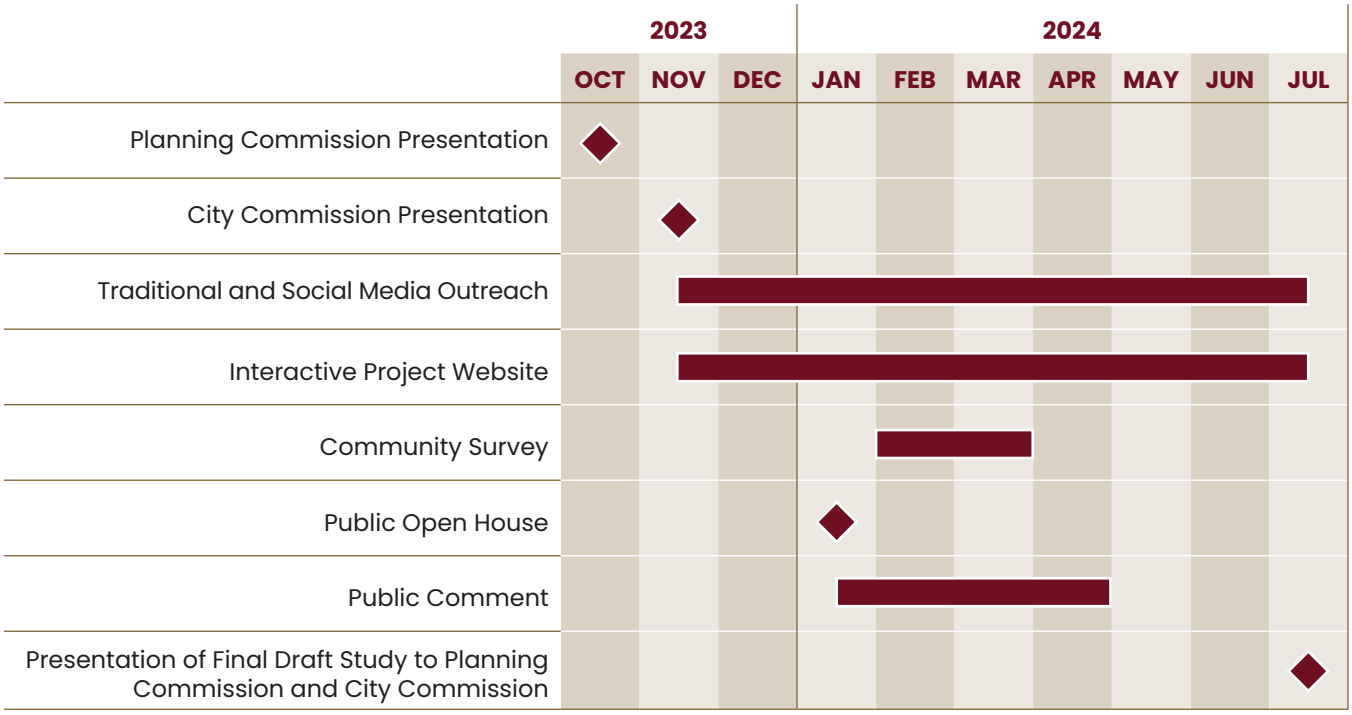
Key components of the public engagement effort were typically advertised through traditional media sources including:

- Press releases; local newspapers
- City and city partners social media platforms
- Promotion on the City's website

An interactive website was created using ArcGIS StoryMap which allows direct community input and can be found here: *https://arcg.is/jqyOC.* A survey was included with the StoryMap and citizens were able to place comments directly on the transportation system map found on the StoryMap. The site also provided up-to-date information about progress on the plan. The full results of all public input activities are included in the Appendices.

Public Outreach

Key components of public outreach included:



October 2023 Planning Commission Presentation

The project team presented to the El Dorado Planning Commission on October 26, 2023. The presentation was scheduled for early in the study process to gather input from the Planning Commission regarding desired outcomes for the study.

The Planning Commission expressed support for the goals of the study, of which the main areas of focus were enhanced mobility, improved safety, economic development support and the need to create a sustainable transportation system. The Commission also provided feedback to the project team. Included in their suggestions were a traffic signal timing review, improvements at the KTA/Boyer Road intersection with K254, and enforcement of trucks utilizing the provided truck routes. The Commission expressed concerns not only for the overall traffic capacity of 6th St., but also for the turn access at 6th St. and Main. A discussion regarding consideration of a new northwest road ensued, and a need for bulb-outs on Main St. was also brought to light.

Additionally, feedback included an overview of needs for bicyclists and pedestrians. Through this conversation the project team learned of the desire for a downtown focus area, pedestrian and bicycle facilities for elementary schools, bike/pedestrian connections from northeast neighborhoods to downtown, more bike parking in key areas and a need for better pedestrian facilities downtown with increased safety measures.

November 2023 City Commission Presentation

The project team presented to the El Dorado City Commission on November 1, 2023. The presentation was scheduled for early in the study process to gather input from the City Commission regarding desired outcomes for the study.

The City Commission expressed a desire for the transportation infrastructure to support economic growth, and provided feedback to the project team for the development of the Transportation Study. Their suggestions included the importance for public feedback on the use of truck routes, exploring improvements to enforce large truck utilization of the provided truck routes, a review of existing and potential future arterial streets, connecting US77/Main St. and McCollum Rd. with the new northwest road, and examination of intersection capacity concerns at Central/K254 and Main/US77.

Additionally, the Commission also expressed concerns for downtown congestion and parking availability, the need for an improved bike route to the middle school, access improvement needs for the northeast neighborhood, expanded bike paths, and a transportation network that is car, bike and pedestrian friendly.

January 2024 Public Open House

The project team held a Public Open House on January 30, 2024, from 4:30p.m. – 6:30p.m. at the El Dorado Civic Center, 201 E. Central Ave., in El Dorado, KS. The open house was intended to inform the community about the Transportation Study project, solicit feedback on the existing transportation network in El Dorado, and announce the public comment period (January 30 – April 1, 2024) via the project website.

Display boards with information on the project were arranged in a semi-circle in the meeting space for attendees to sequentially visit stations and ask questions of the project team and provide feedback on the current transportation network in El Dorado. Display boards included information on the project website and a QR code to visit the project website and complete the public survey. A fact sheet of the project was also provided to attendees and included a project overview and timeline, along with the QR code to visit the project website and complete the public survey.

A total of 10 people attended the public open house and engaged with the project team. A summary of the open house, public comments received, and attendees is provided in the Appendices.

Community Survey

A public survey was conducted from January 30 through April 1, 2024. The purpose of the survey was to gather public input on the existing transportation network and the public's current use of the system, as well as gauging priorities for the future development of the transportation network in El Dorado. In total, 296 surveys were completed online and in hardcopy. The results were used by the project team to help identify existing concerns with the existing transportation network and to help prioritize goals for the

Transportation Study and the future development of the transportation network in El Dorado. A summary of responses is provided in Appendix A. It should be noted the survey was intended to gather information and was not a statistically valid survey. The survey was open to anyone that wanted to respond and should be considered a general pulse of respondents as opposed to representative of all views in the community.

KEY TAKEAWAYS OF PUBLIC INPUT

When considering growth and development in El Dorado, participants placed the most importance on maintaining or improving existing road infrastructure, improving traffic and transportation safety and expanding bike lanes and pedestrian walkways. When asked about their preferred transportation methods, by an outstanding margin walking and personal car usage were the most popular, while biking, carshare, Uber/Lyft, scooter, skateboard and Butler County Transit were listed as "never" or "not often" utilized. When taking children to school, the vast majority followed this data with a private vehicle being more than twice as popular as any other transportation choice. Overall, El Dorado pedestrian and cycling facilities were viewed as at least somewhat safe, with some believing this is an area of opportunity for the city.

Participants placed a high level of importance on safety, travel time and travel reliability. For investments, they prioritized preservation, maintenance and rehabilitation. Overwhelmingly, they felt the ADA accommodations were appropriate within the city. Traffic congestion was not seen as a large issue, and only became notable to some during special events or emergencies, but several experienced regular issues with traffic safety. Participants also placed a high level of importance on the future growth of the El Dorado Transportation Master Plan to be developmentally friendly.

When asked about truck traffic, participants largely agreed that designated truck routes were utilized most of the time and considered continued utilization of these routes to be of high importance. However, half of participants felt there could be improvements to the existing truck routes around the city, and the majority felt that the creation of a new North Bypass from the intersection of N. Haverhill Rd and Oil Hill Rd. to the intersection of N. Main St. and McCollum Rd. to facilitate heavy truck moment was very important. They also expressed a high level of importance on the completion of the South Bypass, which is utilized as a truck detour/route and facilitates moving heavy truck traffic away from Central and Main.

Concerning multi-modal transportation improvement options, maintenance of existing transportation facilities, intersection improvements with ADA compliant pedestrian accommodations and traffic signal timing improvement were considered the most important. However, most felt neutral or satisfied with the current multi-modal transportation network offerings in El Dorado overall.

SECTION 8

Recommended Transportation Plan

RECOMMENDED TRANSPORTATION PLAN

INTRODUCTION

The current roadway network has the vehicle-carrying capacity to serve the City of El Dorado through the year 2045. New roads will be needed to support development to the north and south of the city. The city's Comprehensive Plan calls for improving multimodal options and facilitating the safe and efficient movement of traffic.

Existing streets do not require the construction of additional travel lanes to handle the expected future traffic volumes, although intersection improvements at key locations are recommended. New streets in developing areas will support future growth in the city.

Bicycle facilities are currently recreational in nature and connect the downtown area to El Dorado Lake and its system of trails. Opportunities exist to develop bicycle facilities to serve a transportation role in the city, providing residents and visitors with connections to businesses and attractions.

Sidewalks serve the core of the city and are located along major streets. Future development should include the construction of sidewalks.

The city should continue to support the paratransit services in the area.

ROADWAYS

The roadway section focuses on the streets and highways serving the city, both existing and potential future facilities. Recommendations have been developed for the existing roadway network and for new roadway facilities needed to support the growth of El Dorado.

KEY CORRIDORS AND INTERSECTIONS

A summary of select transportation corridors and intersections in El Dorado is included on the following pages. These were evaluated based upon initial feedback received from the Public Works Department, data reviewed, community engagement, their opportunities for improvement, and if situated in a high-growth area.

Central Avenue (Highway K-254)

Central Avenue (K-254) is the primary east-west arterial street in the city. To the west, K-254 provides a connection to the Wichita area and is a heavily traveled commuter route. Near the west city limit, Central Avenue connects with the Kansas Turnpike (I-35).

Figure 37: Central Avenue (K-254) – Key Intersections

Central Avenue serves commercial development along its western portion, residential areas and the hospital along the mid segment, and the downtown area within its eastern portion. Traffic volumes vary between 6,200 vehicles per day (vpd) near its east end to as high as 15,500 vpd in its western segment. Traffic volumes are well within the capacity of the existing number of lanes, both now and in the future. Signalized intersections currently operate at an acceptable level of service – LOS C or better.

Fourteen of the top 20 crash locations, based on crash frequency, are located on Central Avenue. Seven of those locations would be considered as having a crash rate that is statistically above average.

Field observations noted bicyclists and pedestrians using the sidewalks along Central Avenue. Central Avenue is a corridor that should include facilities for bicyclists and pedestrians.

KEY INTERSECTIONS ALONG CENTRAL AVENUE

- **Central Avenue and Boyer Road:** Located at the west end of the corridor, Boyer Road provides a connection to the Kansas Turnpike (I-35). The intersection with Boyer Road is controlled by a traffic signal. This intersection ranks number 2 on the Top 20 list of crash locations based on frequency. A study is currently underway that is analyzing potential improvements to the Turnpike and K-254 interchange that would include changes to the Central Avenue and Boyer Road intersection.
- **Central Avenue and Village Road:** This intersection serves several businesses including the Walmart Super Center, Dollar Tree, and Casey's convenience store. The intersection is controlled by a traffic signal and has the highest frequency of crashes in the city. Recommendations have been made to change from protected/

permissive left turn signal phasing to protected only phasing in an effort to reduce the number of crashes. The improvements can be reevaluated in 3 to 5 years with updated crash history.

- **Central Avenue and Haverhill Road:** Haverhill Road is a north-south arterial street that carries the truck route for highways US-77 and K-254. To the north, Haverhill Road provides a connection to the areas that will develop in the future. To the south, Haverhill Road serves Butler Community College and the BG Products Veterans Sports Complex. This intersection ranks number three in terms of crash frequency on the Top 20 list.
- **Central Avenue and Main Street:** The intersection with Main Street (US-77) is the primary intersection in downtown El Dorado. Any improvements to this intersection should consider the goals of the Downtown Master Plan and should consider the needs of all road users, drivers, bicyclists, and pedestrians. Central Avenue and Main Street is included on the Top 20 list of higher frequency crash locations.
- **Central Avenue and Vine Street:** This intersection is the turning point for the truck route for K-254 coming from the east. It is on the Top 20 list of crash locations, but its crash rate is not above average.

POTENTIAL PROJECTS

- **Revised Interchange I-35/K-254/K-196:** Based upon the results of the current interchange concept study, reconstruct the interchange connecting these three highways. Boyer Road would be a separate intersection on Central Avenue to the east of the updated interchange.
- **Central Avenue, Boyer Road to East of Haverhill Road:** Reconstruct Central Avenue as a 5-lane arterial street with two through lanes in each direction and a center two-way left-turn lane. This revised cross-section eliminates the raised median and provides space for parallel, separated bicycle facilities and "protected intersections". This cross-section may also support a lower speed limit. See Figures 38 thru 40. This project should consider the construction of "Protected Intersections" for intersections with traffic signals. More discussion on this topic is presented in the Bikeways and Trail Network section later in this chapter.
- **Pedestrian Crossings, Oil Hill to Summit Road:** Investigate opportunities to construct safe pedestrian crossings along this corridor with the city's upcoming Safe Streets 4 All (SS4A) grant.
- **Intersections with Traffic Signals – Signal Timings:** Review the traffic signal phasing and signal timings for the intersections along Central Avenue and adjust as needed.

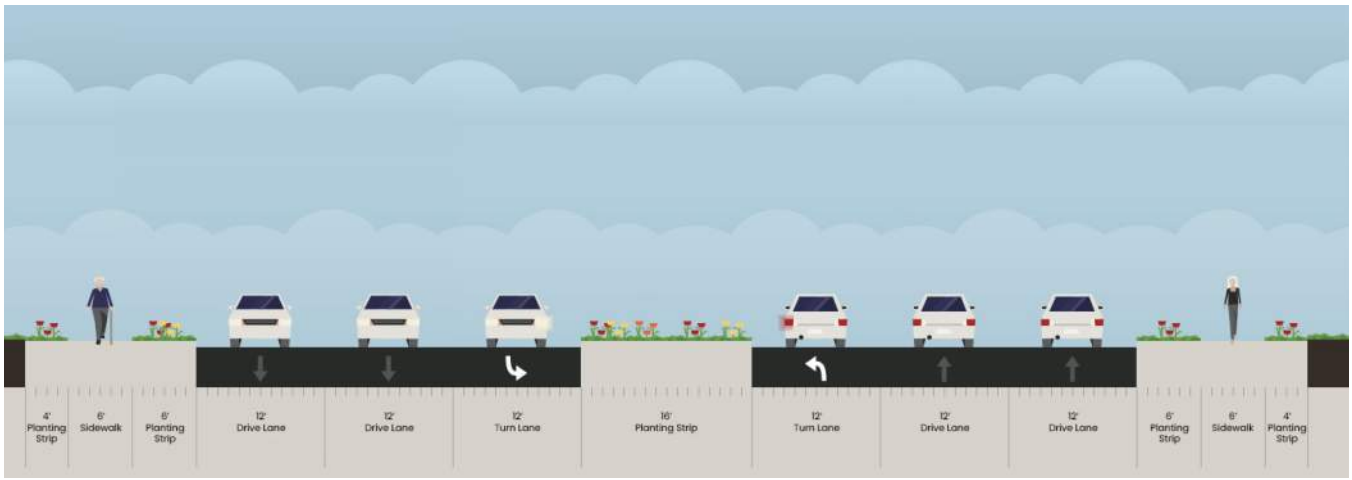


Figure 38: Central Avenue Existing Cross Section

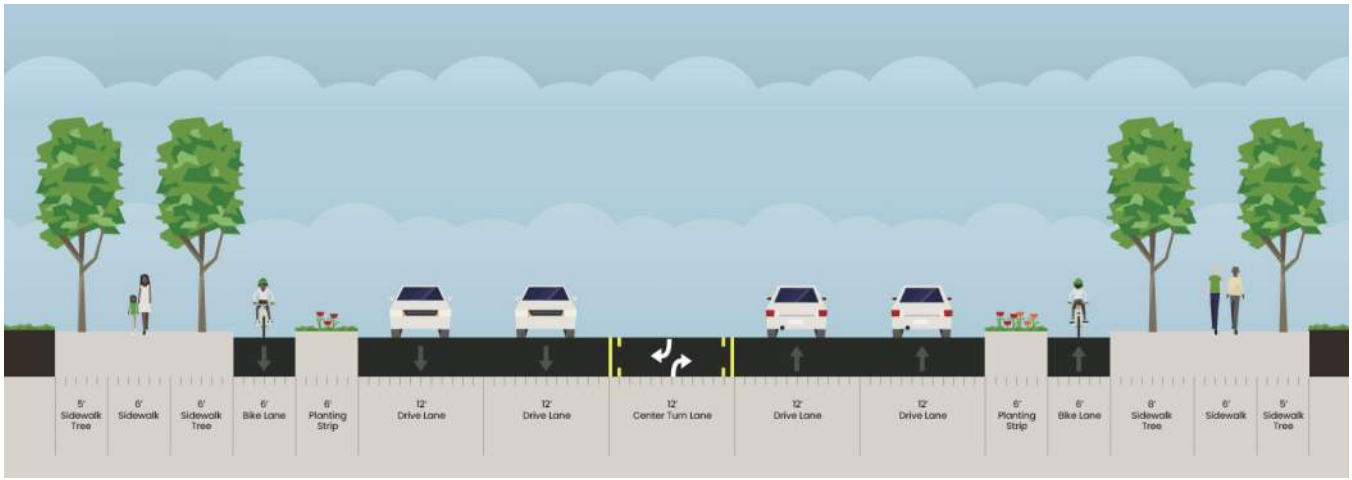


Figure 39: Central Avenue Future Reconstruction – Concept 1

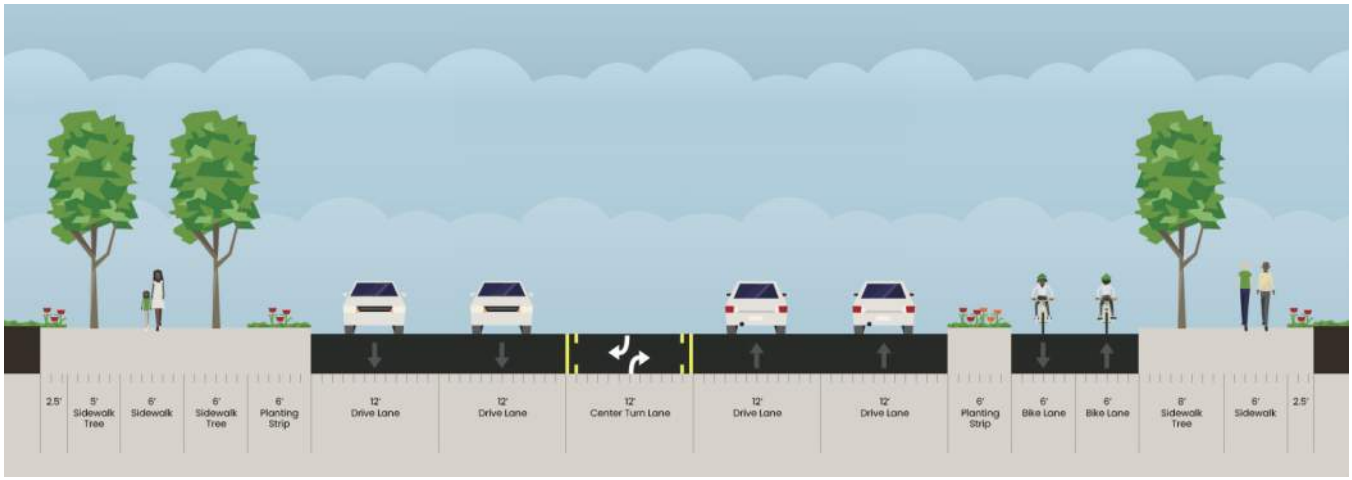


Figure 40: Central Avenue Future Reconstruction – Concept 2

Figure 41: Main Street (US-77) - Key Intersections

Main Street (Highway US-77)

Main Street (US-77) is a four-lane roadway that is the primary north-south arterial street in El Dorado. North of the city, it provides a connection to the Kansas Turnpike (I-35) and to the south it carries highway US-54 into the city where this route turns east along Central Avenue.

Main Street serves El Dorado Middle School located on E 30th Street and provides access to El Dorado High School and Grandview Elementary School via McCollum Road. Main Street passes through the heart of the downtown area.

The north-south truck route for US-77 turns off Main Street at 6th Avenue and at Locust Avenue and then uses Vine Street, paralleling Main Street. East-west truck routes intersect Main Street at 6th Avenue and at Kansas Avenue.

Traffic volumes vary from approximately 3,500 vpd near the north and south ends of Main Street to 11,800 vpd between 6th Avenue and 12th Avenue. All signalized intersections operate at an acceptable level of service except for the eastbound 6th Avenue approach to Main Street where operating conditions are approaching LOS E. Traffic volumes are well within the capacity of the existing number of lanes, both now and in the future.

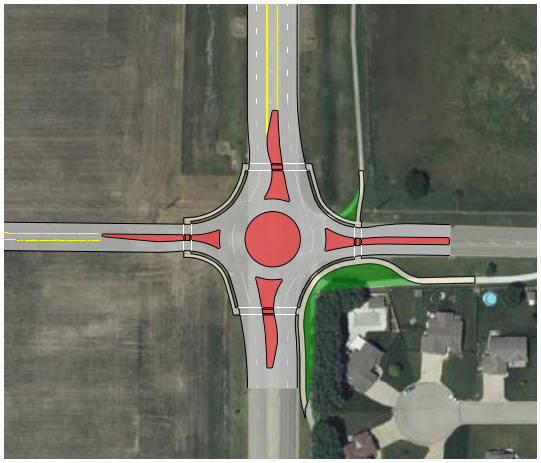
Five of the Top 20 crash locations occur along Central Avenue with three having a crash rate that is above average.

Main Street is a corridor that should include facilities for bicyclists and pedestrians as well as serving personal and commercial vehicles.

KEY INTERSECTIONS ALONG MAIN STREET

- **Main Street and McCollum Road:** This intersection provides access to El Dorado High School and Grandview Elementary School, both located to the east of Main Street. This is also the likely eastern connection for a new Northwest Bypass that would provide a new street to support the areas on the north and northwest sides of the city that are designated for development.
- **Main Street and 12th Avenue:** 12th Avenue provides an important connection to El Dorado Lake. The intersection of Main Street and 12th Avenue is controlled by a traffic signal. This location is on the list of the Top 20 crash locations, but the crash rate is not significantly above average. Analysis shows the intersection failing by the year 2045 due to the lack of a southbound left turn lane.
- **Main Street and 6th Avenue:** This location is a key intersection where the truck routes go from the north on Main Street to east or west on 6th Avenue. 6th Avenue serves as a route from the northeastern portion of the city to the commercial areas along Central Avenue close to the west city limits. This intersection ranks 5th on the list of the Top 20 crash locations. Traffic on the 6th Avenue approaches operate at a poor level of service (LOS D), especially the eastbound approach that is nearing LOS E.
- **Main Street and 4th Avenue:** The railroad crossing at this location especially impacts the west leg of the intersection. Eastbound drivers must stop on the tracks prior to turning onto Main Street. With low traffic volumes, the west leg of 4th Avenue is a candidate for closure.
- **Main Street and Central Avenue:** This intersection was discussed in the section on Central Avenue.
- **Main Street and Downtown Area Intersections:** Several intersections in the downtown area have sight restrictions for drivers stopped on the side streets due to buildings close to the street and on-street parking. Bulb-outs on the corners would better position side street drivers and shorten the crossing distance for pedestrians.
- **Main Street and Kansas Avenue:** This intersection provides a connection to the truck route on the south side of the city. This connection occurs approximately one and a half blocks west of Main Street. Current traffic volumes do not justify the installation of a traffic signal.
- **Main Street and Pine Avenue, Main Street and 1st Avenue:** An active project is creating bulb-outs at these intersections reducing the distance pedestrians need to cross the street. The project will also eliminate a flashing yellow signal.

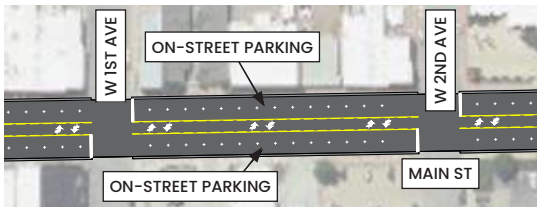
POTENTIAL PROJECTS

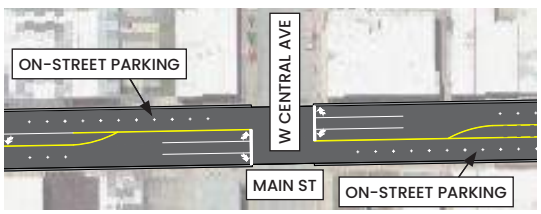


- **Main Street and McCollum Road:**
  The construction of a roundabout is recommended for this location. The roundabout would carry two lanes northbound and southbound, and a single lane eastbound and westbound. The west leg would provide a connection to a future Northwest bypass. The east leg would serve traffic to and from the residential area, high school, and elementary school.

- **Main Street and 12th Avenue:**
  The construction of a southbound left turn lane will significantly improve traffic operations for southbound traffic movements and for the intersection as a whole.

- **Main Street and 6th Avenue:**
  Intersection geometry and traffic signal changes can improve traffic flow and safety. To address the high volume of eastbound traffic turning to go north, lanes on the west leg will be reassigned to create dual left turn lanes, plus a shared lane for through and right turning traffic. The curb radius in the northwest quadrant will be reconstructed to allow southbound, right-turning trucks to avoid hitting the curb. The traffic signal installation would be replaced to accommodate these changes. Improvements should consider the needs of bicyclists and pedestrians.

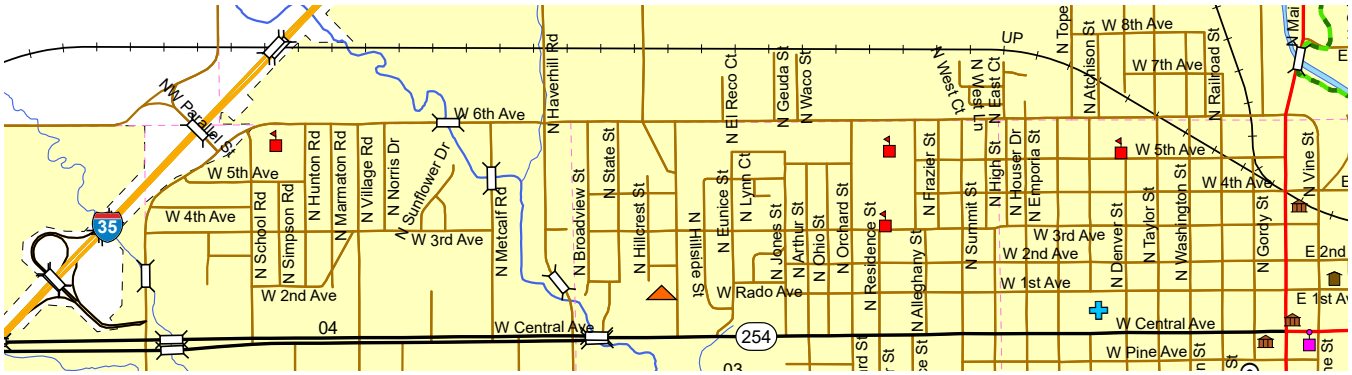




- **Main Street Downtown:**
  This section of Main Street is four lanes with parallel parking on each side. At the intersection with Central Avenue, Main Street restricts parking and adds a left turn lane. With approximately 6,000 vpd, Main Street would be a candidate for a "road diet" reducing the number of lanes from four to three. The middle lane would allow a left turn lane at each intersection, possibly reduce the number of crashes, and allow options for expanding the sidewalk area in front of the businesses.

6th Avenue

6th Avenue is an east-west street that serves the northern portion of the city and acts as an alternative route from northeast neighborhoods to the commercial areas on west Central Avenue. The segment of 6th Avenue from Main Street to Haverhill Road carries the truck route and is classified as a minor arterial street. West of Haverhill Road, 6th Avenue is considered a major collector street until it turns southward and becomes Boyer Road.



6th Avenue is primarily a 3-lane roadway that widens to a 4-lane street from west of Haverhill Road to Oil Hill Road. The segment between School Road and Hunton Road has a raised median, with portions of the median being extremely narrow.

Circle Oil Hill Elementary School and Blackmore Elementary School are located on the south side of 6th Avenue. The segment between Haverhill Road and Main Street carries up to 10,500 vehicles per day. Two of the Top 20 crash locations are along 6th Avenue, Haverhill Road and at Main Street. The crash rates at both locations are significantly above average.

KEY INTERSECTIONS ALONG 6TH AVENUE

- **6th Avenue and Haverhill Road:** The truck route turns south from the east leg of 6th Avenue onto Haverhill Road. At this intersection, 6th Avenue is a 4-lane roadway. The north leg of Haverhill Road widens from a 2-lane road to add a left turn lane at the intersection and the south leg widens from a 4-lane minor arterial street to provide a left turn lane, a through lane, and a right turn lane at 6th Avenue. The northbound through and right turn lanes are separated by a short, narrow raised median.
- **6th Avenue and Oil Hill Road:** 6th Avenue is a 4-lane street at this intersection. Oil Hill Road is a 2-lane street that widens to provide a southbound left turn lane. The pavement on the south leg of Oil Hill Road is in poor condition and entrances to adjacent properties are not well defined.

POTENTIAL PROJECTS

- **6th Avenue, School Road to Hunton Road and the South Leg of Haverhill Road:** Remove the narrow segments of raised medians at these locations. The narrow median segments show evidence of being repeatedly struck by vehicles and provide no access management benefits.
- **6th Avenue, West of Haverhill Road to Oil Hill Road (east intersection):** Implement a road diet to convert 6th Avenue from a 4-lane street to a 3-lane street. This has the potential to reduce the number of crashes, provide a consistent cross-section throughout the 6th Avenue corridor, and better accommodate left turns. Options:
  - Option 1: Remove and replace pavement markings to provide three lanes on 6th Avenue with dedicated left turn lanes at Haverhill Road and a center, two-way left turn lane for the remainder of the segment. One eastbound and one westbound through lane would be provided. Signal heads on the mast arms over 6th Avenue at Haverhill Road would need to be adjusted.
  - Option 2: Reconstruct 6th Avenue to provide a 3-lane roadway. Intersection improvements and widening Haverhill Road to a 3-lane roadway between 6th Avenue and Oil Hill Road could be part of this project.

Northwest Trafficway

The proposed Northwest Trafficway is a significant infrastructure project aimed at supporting economic growth and improving traffic flow and connectivity within the city.

The trafficway would connect Main Street (US-77) and McCollum Road with Oil Hill Road and Refinery Road/Rocky Road, the area of a proposed new interchange with the Kansas Turnpike (I-35). This connection is represented by the blue band on Figure 42 that is intentionally left undefined. The final alignment should minimize impacts to development parcels and fit specific development requirements. The red dashed lines show a route that follows property lines and matches the existing grid system. Improvements to Refinery Road could extend west to K-196 to provide an improved east-west corridor and to support the development area that is northwest of the Kansas Turnpike.

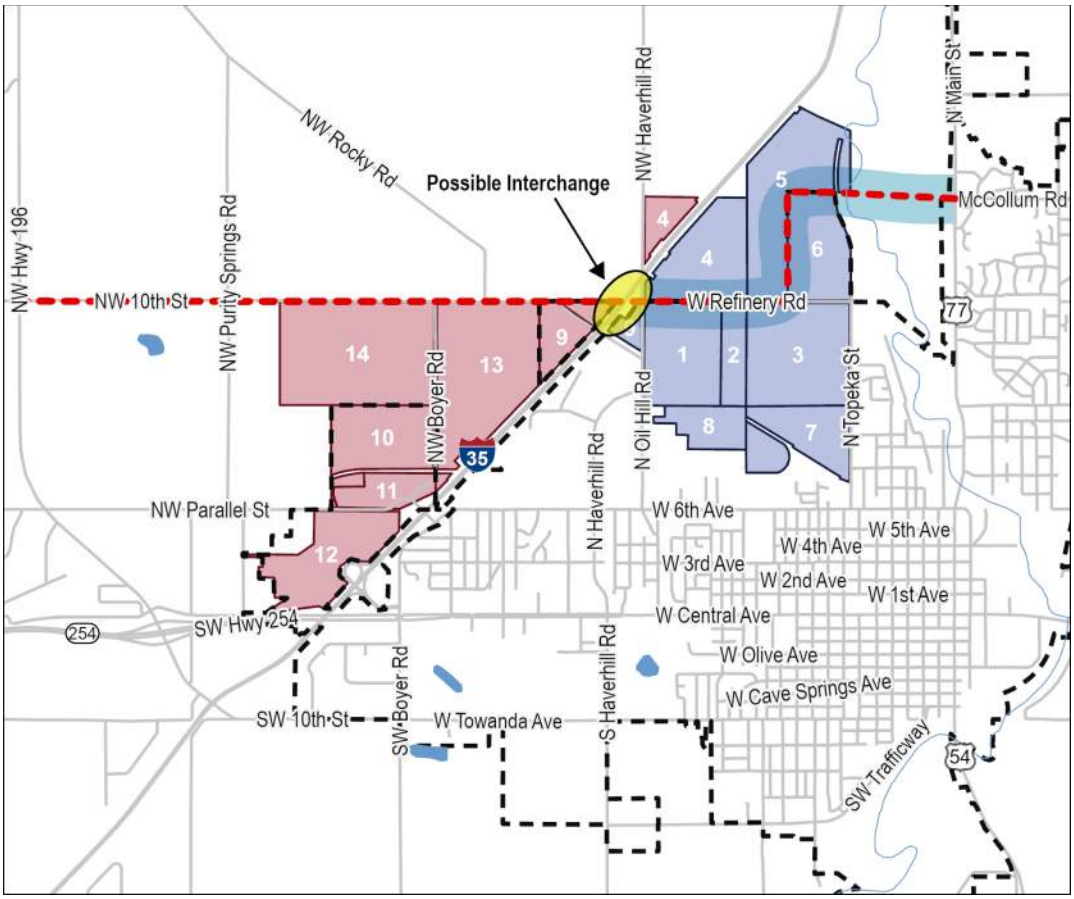


Figure 42: Future Northwest Trafficway

POTENTIAL PROJECTS

- **New Interchange with the Kansas Turnpike (I-35):** A study is underway that is analyzing concepts for a new I-35 interchange with Refinery Road or Rocky Road. A new interchange would provide access to the areas identified for future development.
- **New Northwest Trafficway:** Construct a new arterial street that would support development and provide traffic relief for other routes within the city. The following guidelines should be used for the future corridor:

	Minimum Requirements	Preferred Requirements
Functional Classification	Collector	Arterial
Number of Through Lanes	3	3
Section	Curb and Gutter	Curb and Gutter
Width of Traffic Lanes	11 ft Outside, 14 ft Inside	12 ft Outside, 14 ft Inside
Back to Back of Curb	40 ft	43 ft
Right-of-Way Width	80 ft	100 ft, Including a Utility Corridor
Design Speed	35 mph	40 mph
Pathways	8 ft on one side, with 5 ft buffer from back of curb to pathway	10 ft on one side, with 5 ft buffer from back of curb to pathways
Access Control	Restrict access only near intersections	Public Streets Only

Southwest Trafficway

The existing Southwest Trafficway carries the truck route from Main Street to Haverhill Road. An extension of the Southwest Trafficway would connect the K-196 interchange with Central Avenue (K-254) with Haverhill Road. The extension is represented by the brown line in Figure 43.

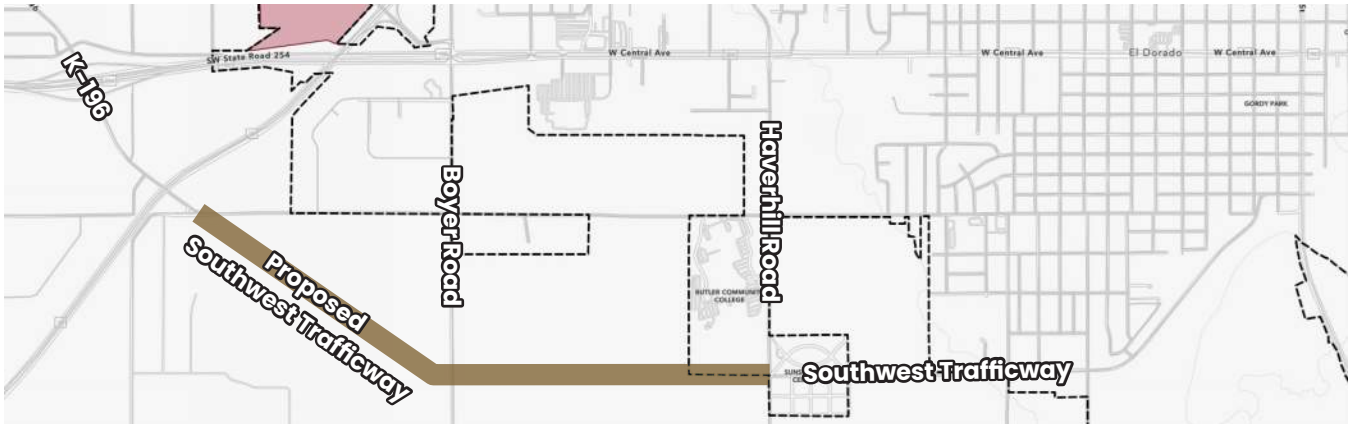


Figure 43: Southwest Trafficway Extension

POTENTIAL PROJECTS

- **Southwest Trafficway Extension:** The extension of the Southwest Trafficway could be constructed in two phases. The first phase would construct a new 3-lane arterial street to connect Boyer Road to Haverhill Road. The second phase would connect the K-196 interchange with Boyer Road.

- **Southwest Trafficway/Conner Avenue and Kansas Avenue:** This project would be just west of Main Street where Kansas Avenue meets Conner Avenue/Southwest Trafficway. Minor intersection improvements would better define the truck route and better position eastbound Kansas Avenue drivers at the intersection with Conner Avenue.

Southeast Trafficway

A Southeast Trafficway would carry the truck route from the Main Street intersection with Kansas Avenue east and north to the intersection of Locust Avenue and Vine Street. The truck route would then continue north on Vine Street.

POTENTIAL PROJECT

Construction would have a significant impact on the existing mobile home park. The timeframe for this project is most likely near the horizon year of 2045.

Traffic Operational Improvements

The number of lanes on each of the main arterial streets is adequate to carry existing and expected future year traffic. Traveler delays and areas of congestion are associated with traffic signals. The needs of pedestrians crossing major streets is an important consideration.

POTENTIAL PROJECTS/STUDIES

- Review the timings and phasing for the traffic signals located along Central Avenue, Main Street, and 6th Avenue. The review should include the timings for green, yellow change, and all-red clearance intervals with the goals of reducing delays and improving safety. This work can be done with the upcoming SS4A project.
- A traffic study should be conducted to review the traffic control devices for the pedestrian crossings on Central Avenue at Topeka Street. As Central Avenue is the city connecting link for highway K-254, a request for a study can be made to KDOT's District Engineer and a study will be scheduled.

BIKEWAYS AND TRAILS NETWORK

A robust system of bicycle facilities can significantly impact the local economy by supporting local businesses as well as attracting tourists interested in cycling which leads to increased spending for lodging, restaurants, retail, and other tourist-related businesses.

Case Studies

Three examples where the development of a strong network of cycling facilities has stimulated local economic development are Emporia, Kansas; Bentonville, Arkansas; and Crosby, Minnesota.

EMPORIA, KANSAS (POPULATION 24,100)

Emporia has experienced a notable transformation through the rise of bicycling, particularly driven by the popularity of gravel cycling events such as the Unbound Gravel (formerly known as the Dirty Kanza). This annual race, which attracts thousands of cyclists from around the world, has had several significant impacts on the community. The influx of cyclists and their supporters has brought substantial economic benefits to Emporia. Local businesses, including hotels, restaurants, and shops, experience increased patronage, particularly during the event weekends. The economic impact extends beyond these peak times as Emporia gains recognition as a cycling destination, encouraging year-round tourism.

To accommodate and promote cycling, Emporia has invested in infrastructure improvements. This includes the development of bike lanes, trails, and other cycling-friendly amenities. Such enhancements not only benefit visiting cyclists but also improve the quality of life for residents by providing safer and more accessible options for biking as a mode of transportation and recreation.

BENTONVILLE, ARKANSAS (POPULATION 60,900)

The construction of bicycling facilities has had a profound impact on Bentonville, Arkansas. These facilities have driven economic growth through tourism and new business ventures, improved the quality of life for residents, and enhanced property values. Additionally, they have promoted environmental sustainability, fostered a strong cycling culture, and integrated arts and culture into the community. Bentonville's transformation into a biking hub serves as a model for how strategic investment in biking infrastructure can benefit a city economically, socially, and environmentally.

CROSBY, MINNESOTA (POPULATION 3,000)

The development of bicycling facilities has significantly transformed Crosby, Minnesota, contributing to positive economic, social, and environmental changes. The creation of a world-class mountain biking trail system in the nearby Cuyuna Country State Recreation Area has attracted a significant number of tourists from around the United States. This influx of visitors has revitalized the local economy, bringing in millions of dollars annually from tourism-related activities. Tourists visiting for biking spend money on lodging, food, and other services, which has sustained existing local businesses and led to the development of new businesses. The city's focus on creating a bike-friendly environment has not only attracted visitors but also fostered a vibrant, healthy, and sustainable community.

OPPORTUNITY FOR EL DORADO

The City of El Dorado has an opportunity to leverage the bicycle trails at El Dorado Lake with the continued development of bicycle facilities. Existing bicycle facilities are focused on recreational use. They are primarily located in the northeast part of the city and provide connections to the lake area. Opportunities exist to develop a bicycle facilities network that can serve a transportation function as well as support recreational cyclists. Proposed bicycle facilities are shown in Figure 44. The desirable width for a multiuse path is 10 feet, although 8 feet can be used when right of way is limited.

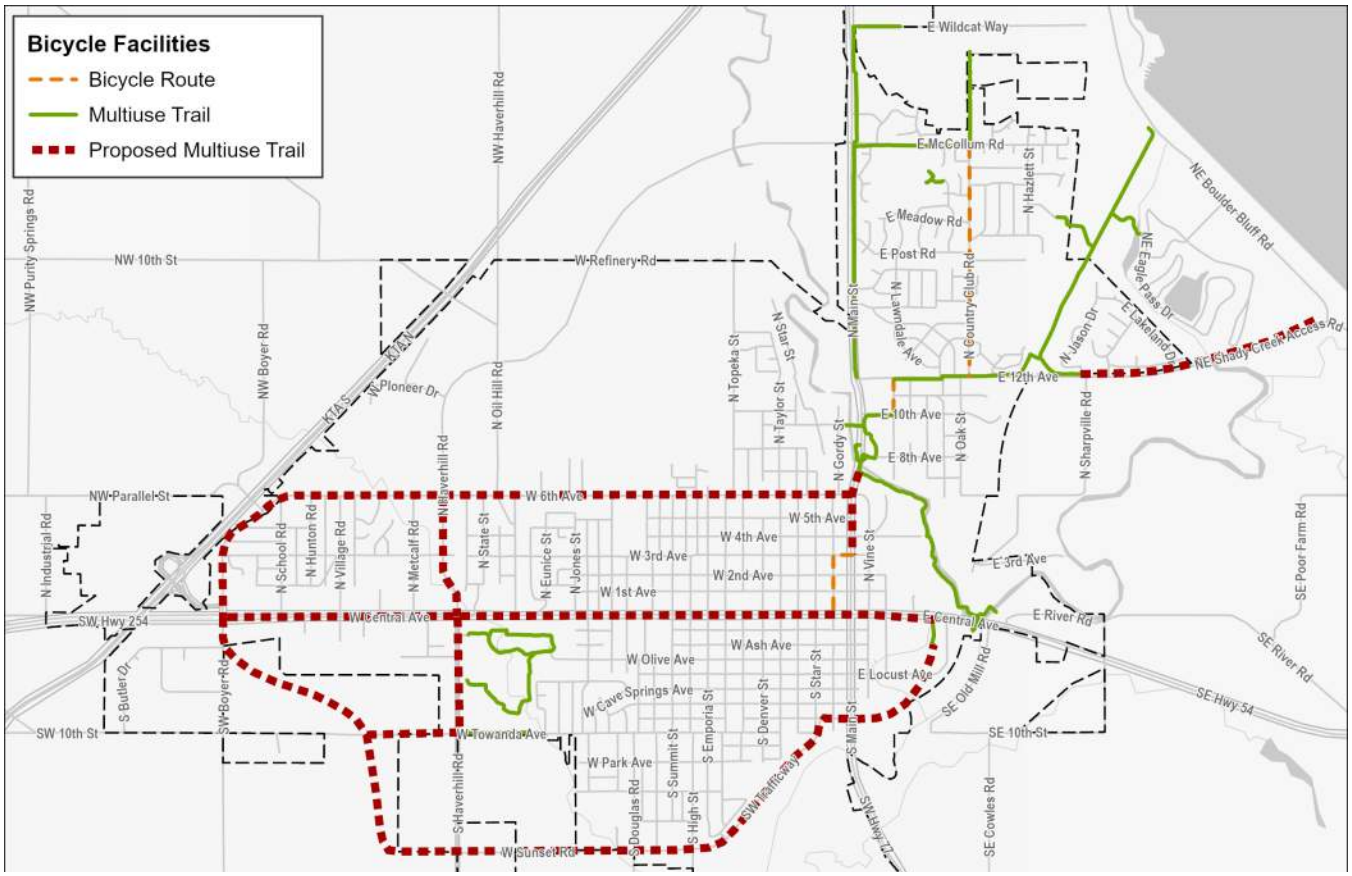


Figure 44: Existing and Proposed El Dorado Bicycle Facilities

CORRIDORS/PROJECTS

- **Central Avenue:** This corridor connects residential neighborhoods to many businesses along Central Avenue, downtown, and the trails at El Dorado Lake. Bicycle facilities should be separated from the street and could be combined with pedestrian sidewalks in a multiuse trail. Concepts are shown in Figures 39 and 40 as part of the Central Avenue roadway improvement section.
- **Haverhill Road:** This corridor would be a north-south route and connect Butler Community College to Central Avenue and to 6th Avenue. Separate bicycle trails are recommended.
- **6th Avenue:** This east-west corridor would provide a route serving two elementary schools as well as a connection to the El Dorado Lake trails. Separate multiuse trail on the south side of 6th Avenue is recommended.
- **Southwest Trafficway:** This corridor would be more of a recreational route that would connect hotels on the west end of the corridor to the trails at El Dorado Lake. The western segment should be a separate trail, while the segment east of Haverhill Road may be bicycle lanes at the edge of the street.
- **12th Avenue:** This corridor connects the existing bike/pedestrian facilities from US-77/North Main Street which currently end at North Jason Drive east to the Walnut Creek Athletic Complex and to El Dorado Lake State Park. This connection was identified as an important project in public engagement meetings with KDOT for a proposed bridge crossing. This project will require coordination between the city of El Dorado, the State Park, and perhaps Butler County.

PROTECTED INTERSECTIONS

Future projects to construct bicycle facilities should consider including "protected intersections" in the design as part of a network of protected bikeways. This has been previously discussed in the Central Avenue corridor list of projects.

Figure 45: Protected Intersection Graphic from the City of San Luis Obispo

- The National Association of City Transportation Officials (NACTO) provides guidance regarding protected intersections.
- The design keeps bicycles physically separated from motor vehicles until they reach designated crossings at an intersection. The design can reduce the speed of turning vehicles that may conflict with cyclists or pedestrians, improve sightlines making cyclists and pedestrians more visible to motorists, and can shorten the crossing distance for those walking or biking.

Project Prioritization

Prioritizing transportation projects considers improving safety, supporting economic development, reducing congestion, and providing modal options. Projects have been identified in the El Dorado network in Near-Term (ideally, constructed in the next 1-5 years), Mid-Term (6-10 years) and Long-Term (10+ years or when changing circumstances dictate). All dollars below are 2024 (not inflated) and are for budgeting purposes only.

NEAR-TERM

- **Time Frame:** 1 to 5 years
- **Characteristics:**
  - Focuses on projects that can be quickly designed, approved, and implemented.
  - Often includes maintenance and rehabilitation projects, minor roadway improvements, safety enhancements, and operational improvements.
  - Typically involves projects that have already secured funding or are relatively low-cost and high-impact.

Table 4: Near-Term (1-5 year) Potential Projects

ID#	Project	Improvement Type	Roadway	Right-of-Way	Contingency (30%)	TOTAL
	N Main Street & 6th Avenue	Intersection & Traffic Signal	$654,000	$56,000	$197,000	**$851,000**
	N Main Street & McCollum Road	Roundabout	$1,294,000	$53,000	$389,000	**$1,683,000**
	Country Club Road, E 29th Street to E 30th Street	New 3-lane Roadway	$3,493,000	$650,000	$1,243,000	**$5,386,000**
	E 30th Street, El Dorado Middle School to Country Club Road	New 3-lane Roadway	$1,912,000	$200,000	$643,000	**$2,746,000**
	W 6th Avenue, Metcalf Road to Oil Hill Road	4-lane Convert to 3-lane	$2,602,000	$0	$781,000	**$ 3,383,000**
	Main Street, Central Avenue to 3rd Avenue	4-lane Convert to 3-lane	$1,678,000	$0	$504,000	**$2,182,000**
	W Central Avenue (K-254) & N Topeka Street	RRFB or PHB	RRFB: $18,000 PHB: $270,000	$0	RRFB: $5,400 PHB: $81,000	**RRFB: $23,400** **PHB: $351,000**

MEDIUM-TERM

- **Time Frame:** 5 to 10 years
- **Characteristics:**
  - Encompasses projects that require more extensive planning, design, and coordination.
  - May include larger infrastructure projects, such as new roadways, major expansions, significant public transit improvements, and multimodal facilities.
  - These projects often require a more detailed environmental review and public consultation process.
  - A few of these projects are low cost with significant impacts.

Table 5: Medium-Term (5-10 year) Potential Projects

ID#	Project	Improvement Type	Roadway	Right-of-Way	Contingency (30%)	TOTAL
	W Kansas Avenue & SW Trafficway	Intersection Improvements	$150,000	$0	$45,000	**$195,000**
	W 6th Avenue School Road to Hunton Road	Remove Median Islands	$222,000	$0	$67,000	**$289,000**
	N Haverhill Road, South of 6th Avenue	Remove Median Island	$75,000	$0	$23,000	**$98,000**
	S Main Street & Olive - Main Street Intersections	Bulb Outs	$273,000	$0	$82,000	**$355,000**
	W 4th Avenue, West Approach to N Main Street (U.S. 77)	Remove Approach	$185,000	$0	$56,000	**$241,000**

LONG-TERM

- **Time Frame:** 10 to 20+ years
- **Characteristics:**
  - Involves large-scale and complex projects that require substantial planning, design, and funding.
  - Includes major new infrastructure developments, such as new highways, rail systems, airport expansions, and major transit corridors.
  - Projects at this stage typically align with long-range transportation plans and may depend on evolving technologies and demographic trends.

Table 6: Long-Term (10-20 year) Potential Projects

ID#	Project	Improvement Type	Roadway	Right-of-Way	Contingency (30%)	TOTAL
	KTA & K-254	Reconstruct Interchange	*	*	*	*
	KTA & NW Rock Road	New Interchange	*	*	*	*
	SW Trafficway, K-196/K-254 to Haverhill Road	New 3-lane Roadway	$15,543,000	$4,500,000	$6,013,000	**$26,056,000**
	NW Trafficway, Oil Hill Road to McCollum Road	New 3-lane Roadway	$19,878,000	$5,500,000	$7,614,000	**$32,992,000**
	Central Avenue, Boyer Road to East of Haverhill Road	5-lane Roadway + Bikeway	$9,120,000	$0	$2,736,000	**$11,856,000**
	S Vine Street, W Kansas Avenue to E Central Avenue (K-254)	New 3-lane Roadway	$1,358,000	$1,010,000	$711,000	**$3,079,000**
	Oil Hill Road, W Refinery Road to NW Rocky Road	3-lane Roadway	$2,123,000	$250,000	$712,000	**$3,085,000**
	W Refinery Road, K-196 to NW Rocky Road	3-lane Roadway	$17,500,000	$1,900,000	$5,820,000	**$25,220,000**
	NW Rocky Road, W Refinery Road to Oil Hill Road	3-lane Roadway	$3,807,000	$150,000	$1,188,000	**$5,145,000**
	Country Club Road, E 30th Street to Myers Road	New 3-lane Roadway	$5,310,000	$2,000,000	$2,193,000	**$9,503,000**

** Costs are being determined in a separate report by others, currently in draft format*

ACTIVE TRANSPORTATION PROJECTS

- **Characteristics:**
  - Involves new bicycle and pedestrian accommodations.
  - These projects are sometimes stand-alone and sometimes constructed with other adjacent transportation projects.

Table 7: Active Transportation Projects

ID#	Project	Improvement Type	Roadway	Right-of-Way	Contingency (30%)	TOTAL
	Central Avenue Multiuse Path	Multiuse Path	$872,000	$0	$262,000	**$1,134,000**
	6th Avenue Multiuse Path	Multiuse Path	$1,057,000	$0	$318,000	**$1,375,000**
	Haverhill Road Multiuse Path	Multiuse Path	$499,000	$0	$150,000	**$649,000**
	Southwest Trafficway Multiuse Path	Multiuse Path	$1,730,000	$0	$519,000	**$2,249,000**
	Country Club Road	Sidewalks	$332,000	$0	$100,000	**$432,000**
	Summit Park	Sidewalks	$79,000	$0	$24,000	**$103,000**
	Graham Park	Sidewalks	$116,000	$0	$35,000	**$151,000**
	12th Avenue, N Jason Street to the Walnut Creek Athletic Complex	Multiuse Path	$460,000	$0	$138,000	**$598,000**

SECTION 9

Funding

FUNDING

INTRODUCTION

The transportation system of El Dorado has many needs and opportunities for improvement. Many of these proposed long-term improvements carry a substantial cost to the city. However, the current climate for transportation funding has expanded greatly in recent years with the passing of the Bipartisan Infrastructure Law, and there are more opportunities than ever to obtain state and federal grants for transportation infrastructure. With such massive growth in this industry, being aware of new funding opportunities and programs as they are announced is critical. In addition, identifying the most relevant grants and creating compelling applications will be a key part of achieving the city's long term transportation goals.

INVOLVEMENT

Participating in regional transportation organizations, specifically the South-Central Kansas Transportation Coalition (SCKTC), a committee of the Wichita Regional Chamber of Commerce, can provide many benefits to the city. The city will be able to advocate for important regional projects as part of the IKE infrastructure program. The City will understand competing interests regionally and will be able to leverage relationships for cooperative infrastructure pursuits, particularly as it pertains to state highway infrastructure, and the IKE Local Consult process. KDOT values the input of regional entities like SCKTC, and projects that show cooperation and support from multiple agencies typically scores well with KDOT project selection. This demonstrates the need for El Dorado involvement and partnership with SCKTC and with adjacent agencies like the City of Towanda and Butler County.

OPPORTUNITIES

There are a variety of state and federal funding opportunities available, this section will briefly cover some of the programs most relevant to the needs of the City of El Dorado:

City Connecting Link Improvement Program (CCLIP)

The CCLIP program is a KDOT funded program which aims to assist cities to fund improvements to city roads that carry a state highway designation. Three types of projects are eligible for this program: Surface Preservation, Pavement Restoration, and Geometric Improvements. This program is a part of KDOT's Eisenhower Legacy Transportation Program (IKE). Local funding match percentage varies from 0 to 25 percent. Applications for this program are open on an irregular basis when KDOT issues a "call for projects."

Community Development Block Grant (CBDG)

The CDBG program is a federally funded program that operates under the United States Department of Housing and Urban Development (HUD). In Kansas, it is managed by the Kansas Department of Commerce. This program covers a wide range of projects and seeks to support community development activities to build stronger and more resilient communities. To support community development, activities are identified through an ongoing process. Activities may address needs such as water and sewer infrastructure, sidewalks, trails, and ADA improvements, as well as housing rehabilitation and neighborhood development.

Cost Share Program

The Cost Share Program is a KDOT funded program which provides financial assistance to local entities for transportation projects. It is a flexible program and can be used for a wide range of projects, including road, highway, rail, and pedestrian infrastructure improvements. This program is a part of KDOT's Eisenhower Legacy Transportation Program (IKE) Program. This program requires a 15% local funding match and operates in a fall and spring round of funding each year.

Eisenhower Legacy Transportation Program (IKE)

The IKE program is a long-term, ten-year program that is funded by the state of Kansas. This program is meant to address highways, bridges, public transit, aviation, short-line rail and bike/pedestrian needs across Kansas. The program and associated projects are focused on making roads safer, supporting economic growth and creating more options and resources for Kansans and their communities. Many of the other state funded grants listed below are funded through the IKE program. Additionally, major state highway projects are selected every two years based on input from KDOT's local consult process. This grant relies heavily on having large public support, and working with other organizations and communities to obtain funding is critical.

High Risk Rural Roads Program (HRRR)

HRRR is a Federally funded program, administered by KDOT, which provides financial assistance to local entities for projects that improve rural roads with a history of crashes. Projects are required to target roads with a crash rate higher than the statewide average. This program is a part of KDOT's Eisenhower Legacy Transportation Program (IKE). This program requires a 10% local funding match and operates on an irregular basis determined by the Bureau of Local Projects.

Highway Safety Improvement Program (HSIP)

HSIP is a Federally funded program, administered by KDOT, which provides financial assistance to local entities for highway safety improvement projects. The project must target a public roadway that is consistent with the State Strategic Highway Safety Plan with the goal of correcting hazardous roadway elements. This program requires a 10% local funding match.

Infrastructure for rebuilding America (INFRA)

The INFRA program is a federally funded program that awards competitive grants for multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas. Funding will be made available under the Multimodal Project Discretionary Grants (MPDG) combined Notice of Funding Opportunity.

Kansas Local Bridge Improvement Program (KLBIP)

The KLBIP program is a KDOT funded program that provides funding to replace or rehabilitate locally owned, deficient bridges. Local funding match percentage varies from 0 to 25 percent. This program is a part of KDOT's Eisenhower Legacy Transportation Program (IKE). Applications for this program are open on an irregular basis when KDOT issues a "call for projects."

Rebuilding American Infrastructure with Sustainability and Equity (RAISE)

The RAISE program is a federally funded program that seeks to invest in road, rail, transit and port projects that promise to achieve national objectives. Specifically, the program seeks to build and repair critical pieces of our freight and passenger transportation networks. The eligibility requirements of RAISE allow project sponsors at the State and local levels to obtain funding for large, multi-modal, multi-jurisdictional projects that are more difficult to support through traditional programs. RAISE can provide funding directly to any public entity. Local funding matches vary depending on the income of the entity receiving the grant.

Rural Surface Transportation Grant

The Rural Surface Transportation Grant Program supports projects that improve and expand the surface transportation infrastructure in rural areas to increase connectivity, improve the safety and reliability of the movement of people and freight, and generate regional economic growth and improve quality of life. Rural Surface Transportation grant program funding will be made available under the Multimodal Project Discretionary Grants (MPDG) combined Notice of Funding Opportunity.

Safe Routes To School

This is a smaller program than SS4A but prioritizes pedestrian access projects from residences to schools. Monies can fund studies, but are typically not geared toward construction projects.

Safe Streets and Roads for All (SS4A)

The SS4A program is a 5-year, $5-billion federal discretionary program intended to reduce transportation fatalities and serious injuries on our roadways. This program can apply to planning, roadway, sidewalk, speed management, and various safety improvement projects. This program requires a 20% local funding match and operates in irregular cycles determined by the United States Department of Transportation.

Surface Transportation Block Grant (STBG)

STBG is a Federally funded program which provides financial assistance for the construction and construction engineering of projects. Eligible projects include projects that preserve and improve the conditions and performance of any Federal-aid eligible highway; construction or rehabilitation of a bridge or tunnel on any public road; pedestrian and bicycle infrastructure. This program requires a 20% local funding match and is administered by the Bureau of Local Projects.

Transportation Alternatives (TA)

The TA program is a Federally funded program, administered by KDOT which targets improvements to pedestrian and bicycle facilities. Projects can focus on safety, accessibility, and recreational improvements. This program is a part of KDOT's Eisenhower Legacy Transportation Program (IKE). Applications for this program must be sponsored by a local unit of government. This program requires a 20% local funding match.

APPENDIX A

Community Engagement

Public Participation Plan

Public Participation Plan

City of El Dorado, KS

Transportation Master Plan (R212145.00)
Last revised: July 9, 2024

The following public participation and outreach activities are based on the scope of work agreed upon by the City of El Dorado, KS, and JEO Consulting Group (JEO) for the Transportation Master Plan project (the Plan). This document will serve as the project's Public Participation (P2) Plan and is considered a working document to be updated throughout the project. This plan will also guide how input from the community and key stakeholders is obtained and incorporated into the Plan.

Project Overview

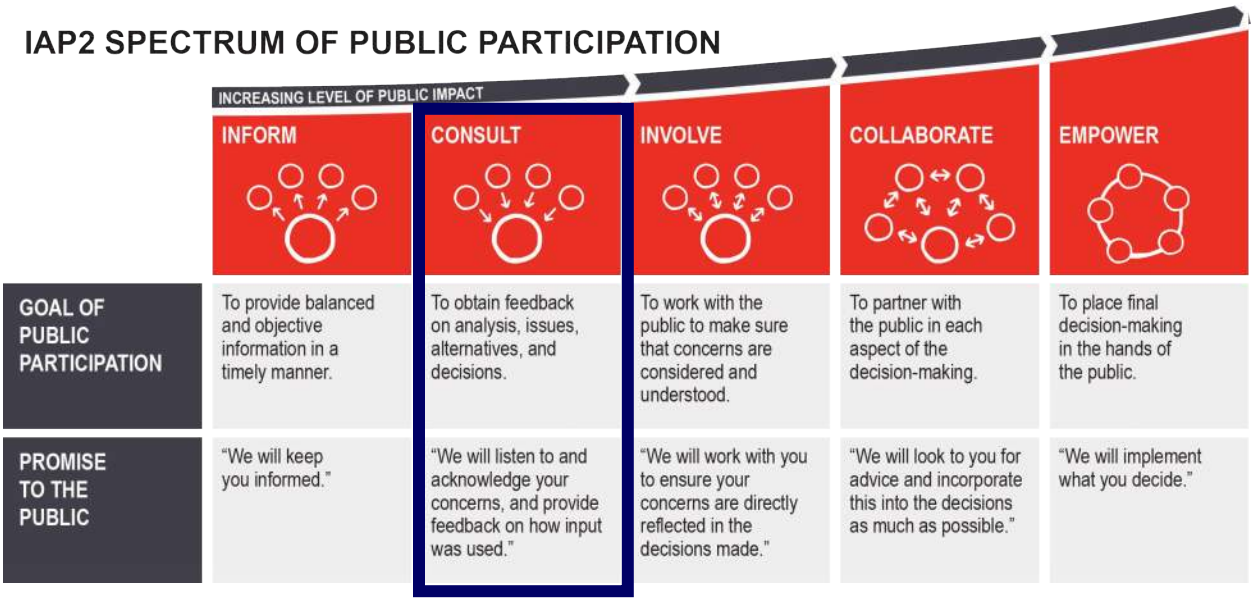
The City of El Dorado's Transportation Master Plan project will result in a comprehensive Transportation Master Plan that aligns with the City's Comprehensive Plan. The Plan will convey the transportation-related needs in El Dorado including a narrative explaining why the investments and strategic actions are important for a desirable transportation future in El Dorado. In addition, the Plan will include an action plan to achieve the recommendations included in the Plan. The Transportation Master Plan will strive to accomplish the following goals:

- ***A safe multimodal transportation system for everyone***
- ***An efficient, reliable, and well-connected transportation system***
- ***A comprehensive pedestrian and bicycle network to support trips for work and pleasure***
- ***A well-maintained and sustainable transportation system***
- ***An accessible system that promotes transportation choices for all citizens while also supporting economic vitality***

The combination of these elements will culminate in a Transportation Master Plan designed to align with the City's Comprehensive Plan and the City's overall vision for future growth and development.

Participation Level

The targeted level of participation, as described in the International Association of Public Participation's (IAP2) Public Participation Spectrum, is ***consult***. At this level, the project team will strive to balance the priorities of the City and project stakeholders; however, final decision-making authority resides with the City.



Potential Project Stakeholders

Project stakeholders can be separated into three categories:

1. City:
    a. Departments & Staff
    b. City Commission & Planning Commission
2. General Public
3. Key Stakeholders:
    a. El Dorado Inc.
    b. Business community/El Dorado Chamber of Commerce
    c. HF Sinclair El Dorado Refining LLC
    d. Groendyke Transport Inc.
    e. Other trucking/logistics companies?
    f. El Dorado Industrial Park tenants
    g. USD 490
    h. USD 375
    i. Butler Community College
    j. Susan B. Allen Memorial Hospital
    k. Butler County Government
    l. KS Dept. of Wildlife & Parks – El Dorado State Lake
    m. Others?

Risk Assessment

Understanding the broader environmental, social, and political context of an infrastructure-based project is an important component of selecting effective public participation tactics and informing the project messaging. The project team should consider the following when engaging with the public on behalf of this project:

- Ensuring technical decisions are made by subject matter experts and not influenced by members of the public without technical expertise
- The need to create and sustain transparency throughout the planning process
- The potential impact of identified alternatives to existing businesses and residential areas
- Ensuring that economic development priorities are taken into consideration and clearly defined
- Ensuring equity and inclusion of all neighborhoods and communities within El Dorado

P2 Goals

- Facilitate values-based engagement: identify the values of the people providing input and report how input was incorporated into the project
- Maintain project teams' situational awareness of input received
- Foster community support for the Plan and forthcoming projects

P2 Approach

To support the development of the Transportation Master Plan, There will be two (2) phases of engagement. Below is a summary of the proposed approach.

	Phase 1: Transportation System	**Phase 2: Goals, Objectives, Action Steps**	**Phase 3: Alternative Development/Future Projects**	**Phase 4: Plan**
Time frame	August 2023 – December 2023	October 2023 – June 2024	December 2023 – July 2024	May 2024 – July 2024
Information sharing focus	• Project overview, including purpose, background information, and engagement opportunities	• Project overview • Share preliminary draft of potential alternatives • Receive public and stakeholder input	• Provide project information to public and community members	• Project update • Share draft Plan • Outline what to expect next
Anticipated goal of engagement activity	• Inform City Commission and Planning Commission of project overview and timeline	• Inform public of project overview, timeline, potential alternatives & project website	• Provide a central, publicly accessible location for project information • Provide virtual alternative to public meeting for public input and feedback • Gauge level of support for potential alternatives	• Share draft Plan with Planning Commission and City Commission • Receive feedback on draft Plan and proposed alternatives/projects
Commission Meetings	• 2 meetings October 2023 (PC) November 2023 (CC)	-	-	• 2 meetings June 2024 (PC & CC)
Open House Public Meetings	-	• 1 (one) open house **January 2024**	-	-
Arc GIS StoryMap	-	• Project website	• Project website	• Project website

Public Awareness and Education

City Commission and Planning Commission Updates

The JEO team will assist city staff to keep the City Commission and Planning Commission apprised of project progress. This includes JEO attending up to four (4) board meeting updates, as identified throughout the project scope of work. JEO will develop presentation materials for Commission updates for review by city staff in advance of Commission presentations.

Public Open House Meetings

One (1) public meeting will be held, with the in-person meeting held in a community location that will be most conducive to public attendance. The public will have the opportunity to engage with members of the study team, view meeting materials, ask questions, and provide feedback.

Meeting notifications include but are not limited to, postcards, press releases in local papers, community fliers, and social media. Notifications will invite comments on the plan, specify any deadlines, and briefly describe the project with the date, time, and location of the meeting. JEO will assist as requested with the creation of meeting notifications and the City will be responsible for the dissemination of meeting notifications and/or invitations.

Meeting materials will be created and provided by JEO, with approval of final drafts from the City. These include, but are not limited to, sign-in sheets, display boards with welcome sign, fact sheets, comment forms, and name tags. A standalone meeting plan will be developed prior to each meeting with more detailed information. All meeting materials can also be made available online via the city's website.

A summary reflecting the substance of the public meeting and an attendance list will be kept with the reviewable record. All comment forms received will also be made a part of the meeting record.

Project Website

The project team will develop a draft project website utilizing Arc GIS StoryMap. The project website will be maintained throughout the life of the project and will include the following features:

- Latest Project News
- Project Overview
- Project Need & Goals
- Existing Conditions
- Community Survey
- Pin-A-Map interactive feature
- Proposed Recommendations (hidden until draft recommendations/draft plan is completed)
- Project Contact Info

A summary of the public engagement received via the project webpage will be created and provided to the City once the public comment period has closed. The summary will reflect public comments received, areas of concern noted by the community on the Pin-A-Map feature, a summary of the history of visits and traffic to the webpage.

Public Information Contacts

- Sasha Haehn | JEO Consulting Group
  shaehn@jeo.com , 316.204.8975
- Julie Clements | City of El Dorado
  jclements@eldoks.com, 316.321.9100

Fact Sheet

CITY OF EL DORADO
Transportation Study

Project Overview

The City of El Dorado is developing a comprehensive Transportation Study for the City. The purpose of the study is to address current and future needs of roadways, bicycle facilities, and pedestrian infrastructure, and to convey the transportation-related needs in El Dorado, including a narrative explaining why the investments and strategic actions are important for a desirable transportation future.

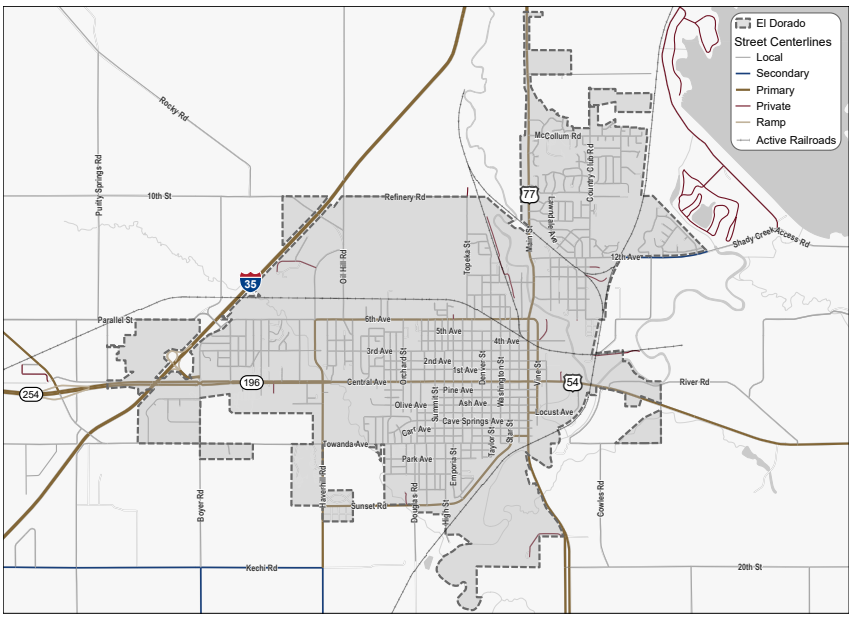
Start Date: August 2023

Completion Date: July 2024

The Study Will:

- Create a vision for transportation and multi-modal mobility (bike, pedestrian, ADA accessible, trail networks, streets and highways... etc.) over the next 25 years.
- Provide a framework and strategies for implementing a sustainable multi-modal transportation system.
- Identify projects to improve safety for travelers, and future projects to improve development opportunities within El Dorado.

El Dorado Transportation Network



We Need Your Input!

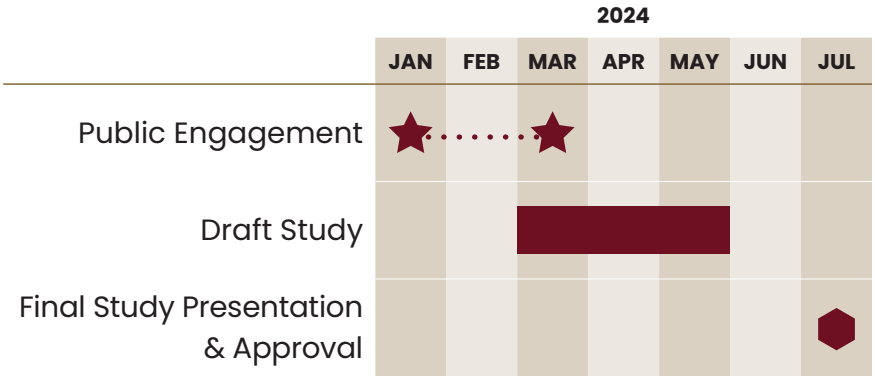
Public input is a critical part of the study process, and all residents of El Dorado and users of the transportation network are encouraged to participate in the public survey for this project.

Scan the QR code at left with your phone's camera or visit **https://arcg.is/jqyOC** *to view the project website and complete the survey.*

Key Goals

1. **Enhance Mobility**
2. **Improve Safety**
3. **Support Economic Development**
4. **Create a Sustainable Transportation System**

Public Involvement Schedule



What's Next?

The next steps will be to develop performance measures, alternative evaluations, project recommendations and funding opportunities.

- **December 2023-February 2024**
  Anticipated data analysis and forecasting
- **January-March 2024**
  Anticipated public/stakeholder engagement
- **March - May, 2024**
  Anticipated draft study development
- **July 2024**
  Anticipated final study presentation and approval

Contact Information

Scott Rickard, *Engineering Department*

316.321.9100 ext. 151 ◆ srickard@eldoks.com
220 E. First ◆ El Dorado, KS 67042

Open House Display Boards

EL DORADOS

WELCOME

We are pleased you are here to learn more about and provide feedback on the City of El Dorado Transportation Study.

How to get the most out of this meeting:

Review each display and talk with project team members to learn more and share your ideas.

Spend as much or as little time with us as you like.

Complete a comment form and drop it in the box.

PROJECT OVERVIEW

El Dorado Transportation Study

The City of El Dorado has initiated a comprehensive Transportation Study for the city. The purpose of the study is to address current and future needs of roadways, bicycle facilities, and pedestrian infrastructure. The study will convey the transportation-related needs in El Dorado, and will include a narrative explaining why the investments and strategic actions are important for a desirable transportation future.

Start Date: August 2023

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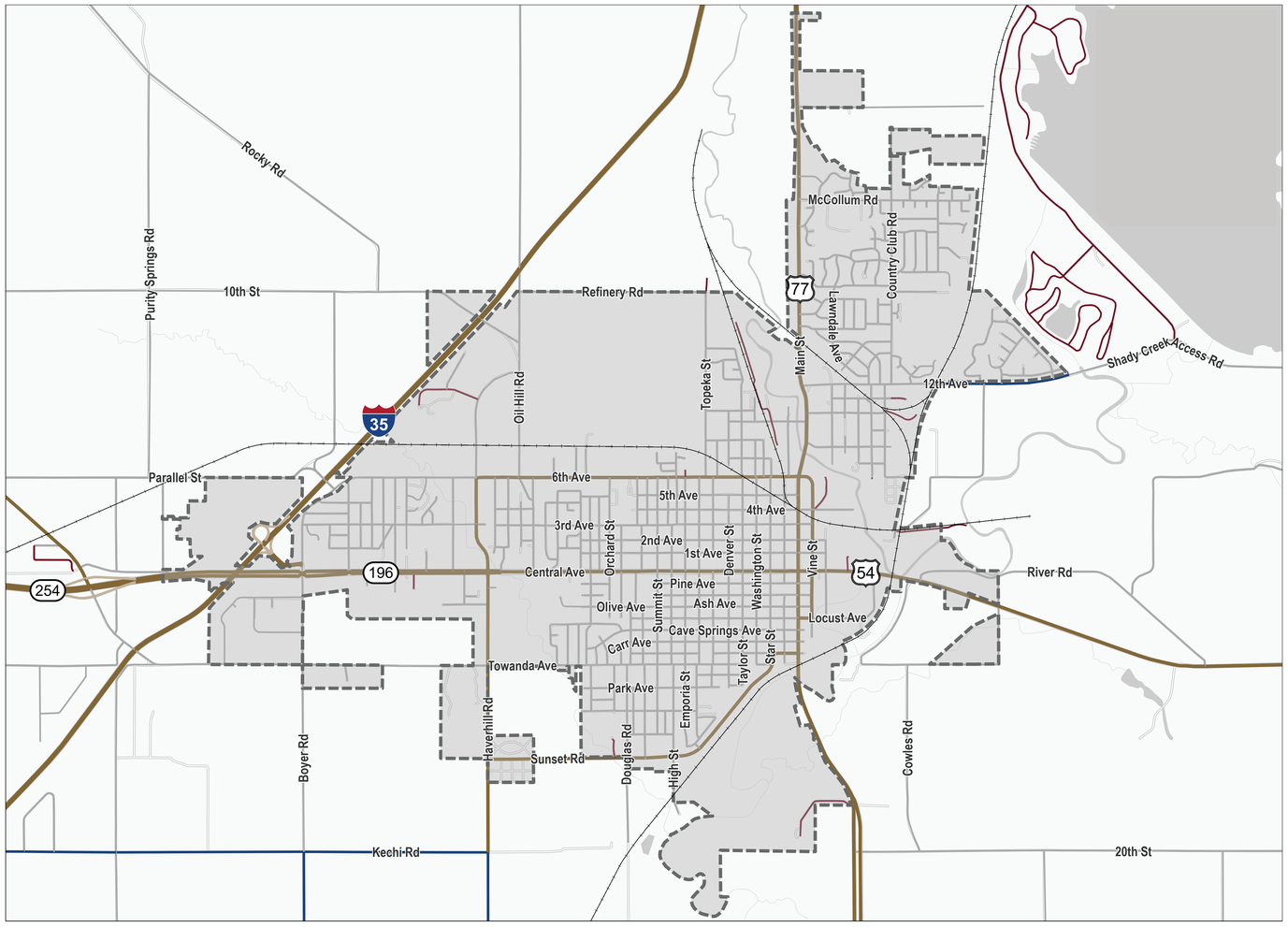

The Transportation Study Will:

- Create a vision for transportation and multi-modal mobility (pedestrian, bike, ADA accessible, trail networks, streets and highways...etc.) over the next 25 years.
- Provide a framework and strategies for implementing a sustainable multi-modal transportation system.
- Identify projects to improve safety and mobility for travelers, and future project to support development opportunities within El Dorado.

We Need Your Input!

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KEY GOALS & OBJECTIVES

Key Goals

1. **Enhance Mobility**
2. **Improve Safety**
3. **Support Economic Development**
4. **Create a Sustainable Transportation System**

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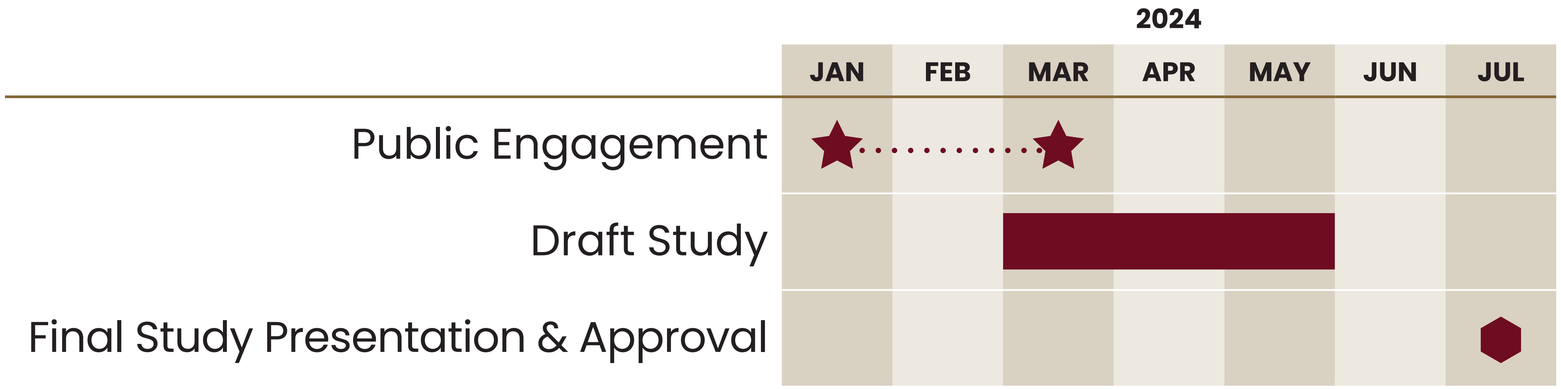

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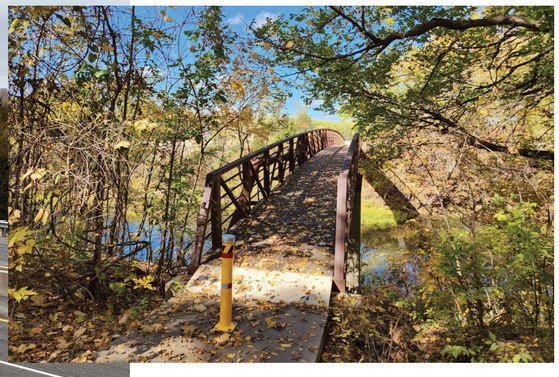
- **July 2024**
  Anticipated final study presentation and approval

WHAT WILL THE PLAN DO?

The Study will Benefit the City of El Dorado by:

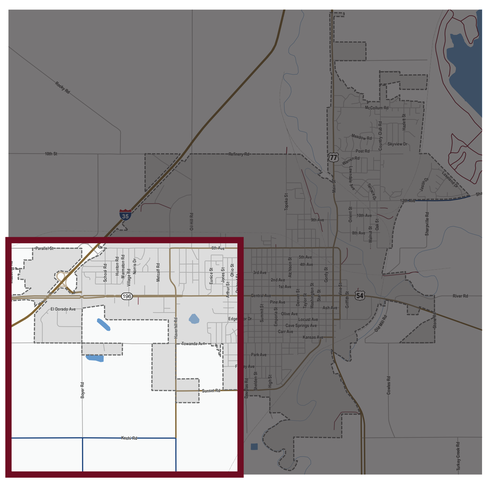
- Helping identify current and future transportation needs.
- Assisting with selecting and planning for multi-modal projects to support future growth and development.
- Positioning El Dorado for large industrial investment.
- Helping create a budgeting plan for the future.
- Assisting with the pursuit of current and future funding sources.

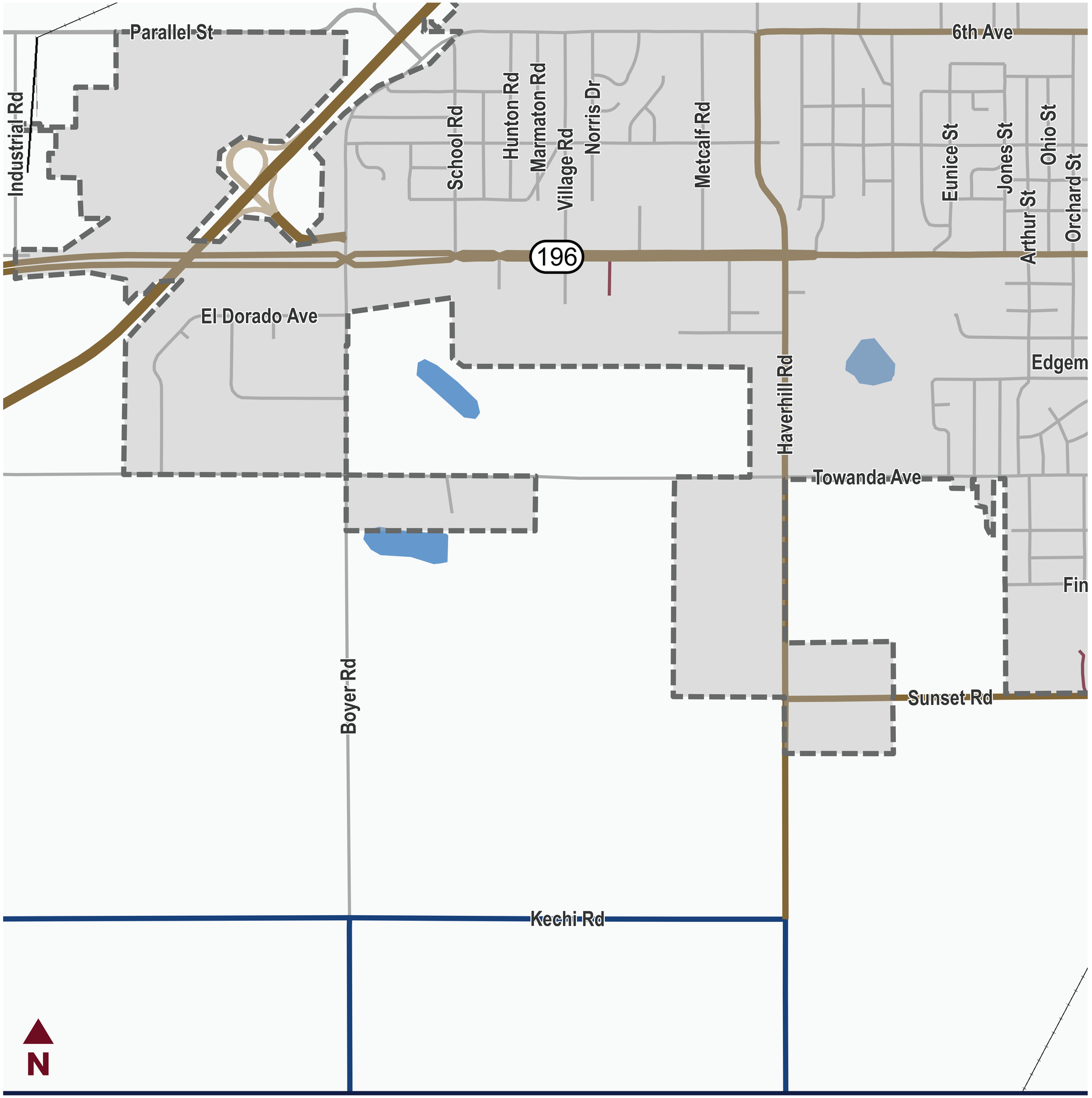


VEHICLE TRAFFIC, BICYCLE, AND PEDESTRIAN COMMENTS

INSTRUCTIONS:

1. Place a numbered dot at the location you would like to leave feedback on.
2. Label a post-it note with the number and provide your comment on the post-it note.
3. Place your numbered post-it note on the 'Parking Lot' board.





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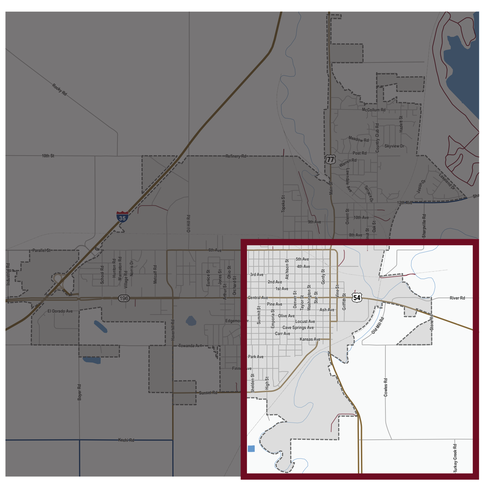

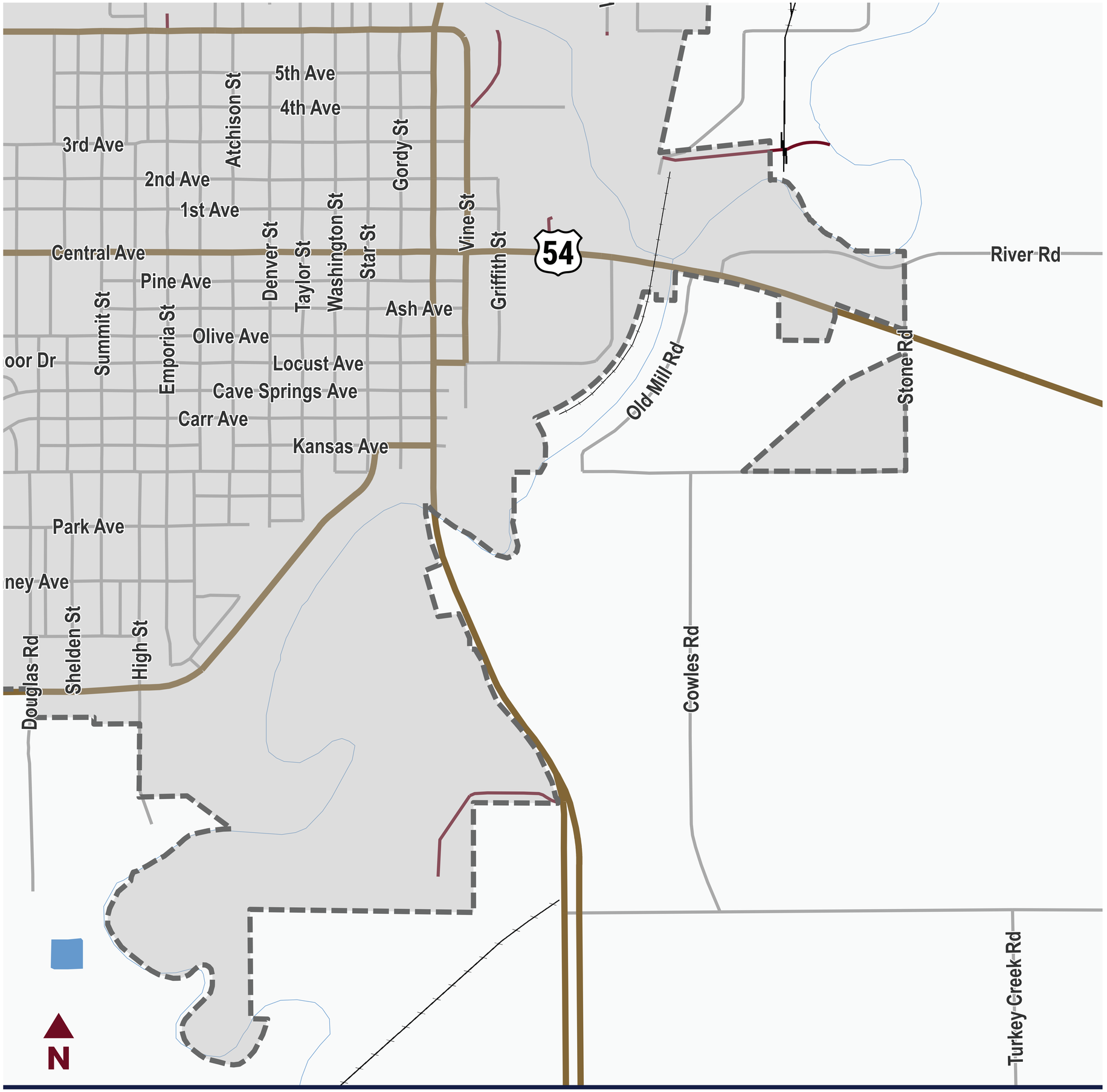

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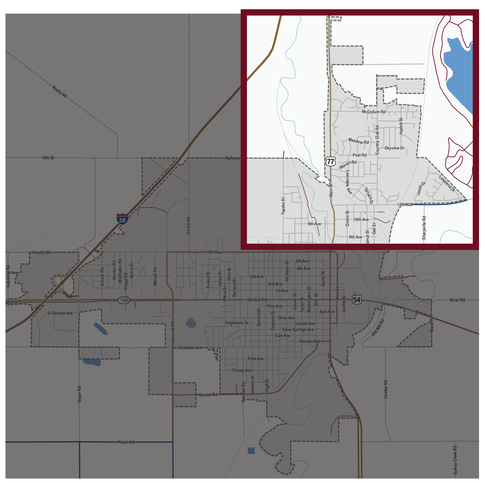

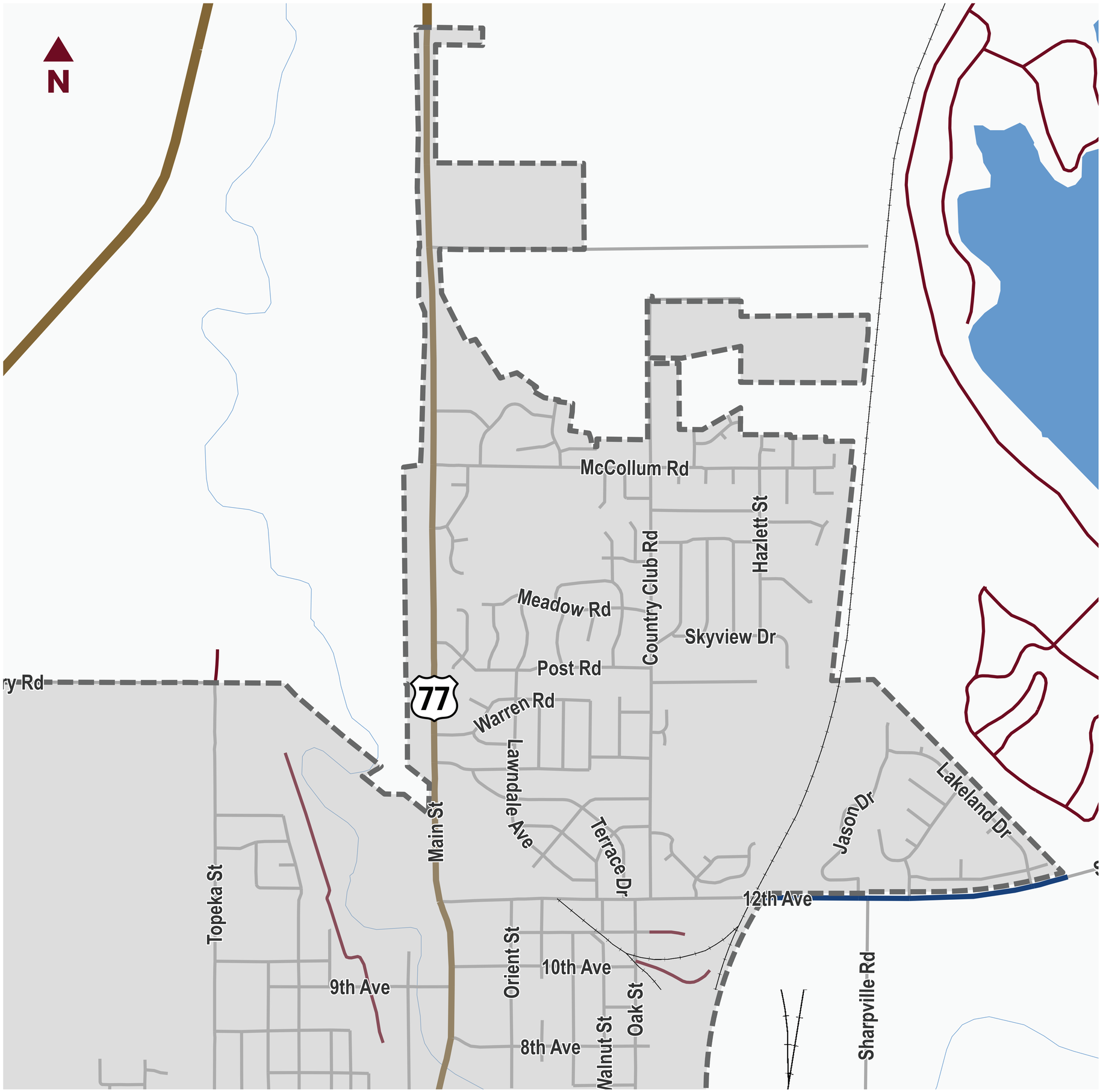

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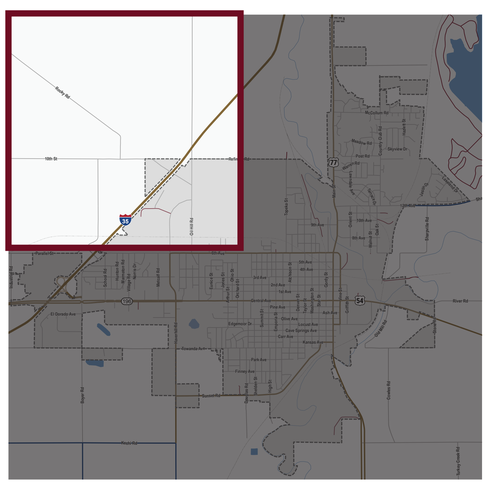


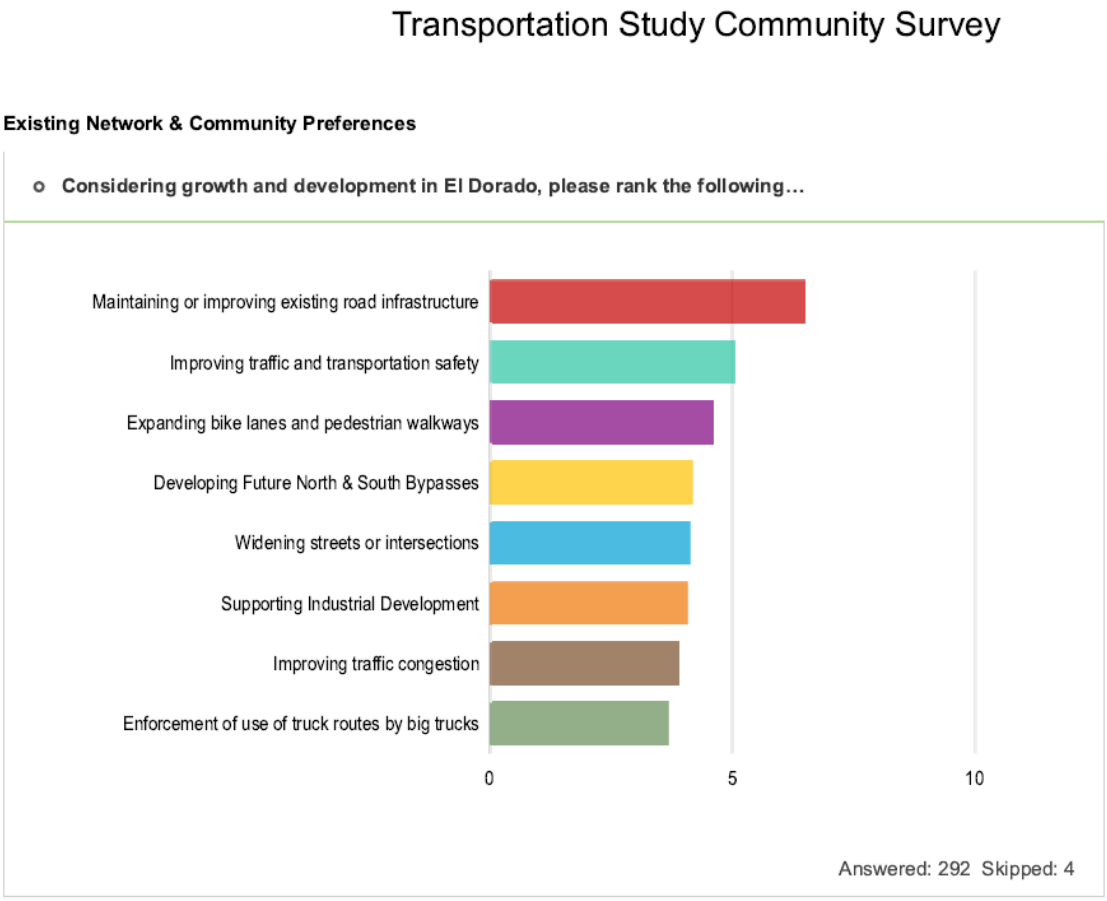
Public Survey Responses

El Dorado Transportation Study- Public Outreach Q&A Data

1. Considering growth and development in El Dorado, please rank the following transportation priorities ;
   (Rank from 1 to 8, with 1 being the highest priority)

   a. Maintaining or improving existing road infrastructure
   b. Expanding bike lanes and pedestrian walkways
   c. Widening streets or intersections
   d. Enforcement of use of truck routes by big trucks
   e. Developing Future North & South Bypasses
   f. Supporting Industrial Development
   g. Improving traffic congestion
   h. Improving traffic and transportation safety

Answer:

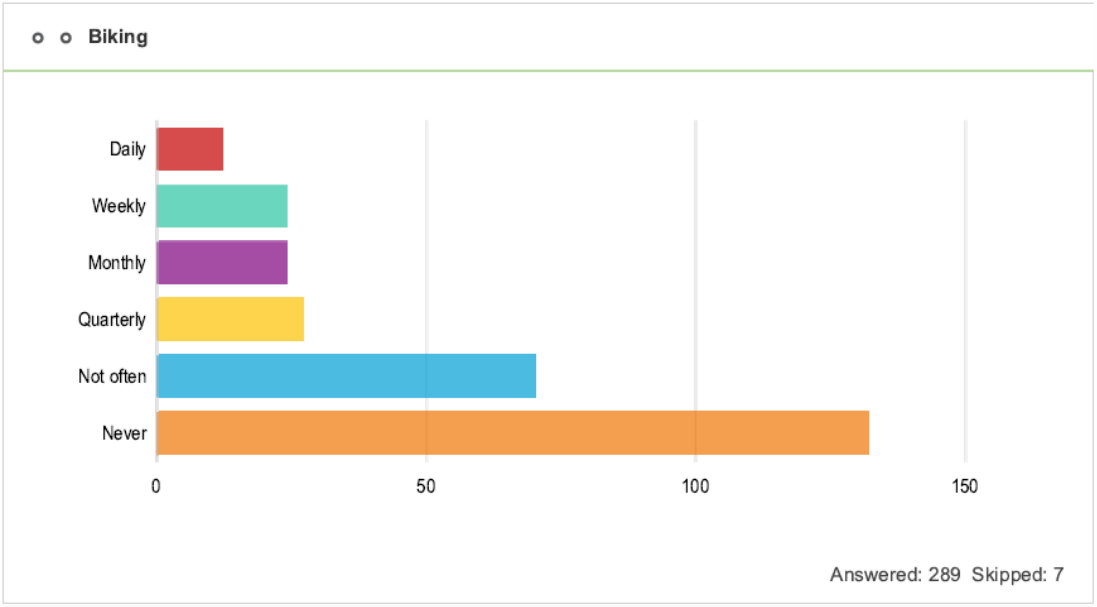


2. What types of transportation do you use and how often? Select all that apply and provide your usage over a [timeframe]. For example: daily, weekly, monthly, quarterly etc.
    a. Biking
    b. Carshare
    c. Personal car
    d. Scooter
    e. Skateboard
    f. Butler County Transit
    g. Uber/Lyft/Etc
    h. Walking
    i. Other: ____

Answer:

Existing Network & Community Preferences

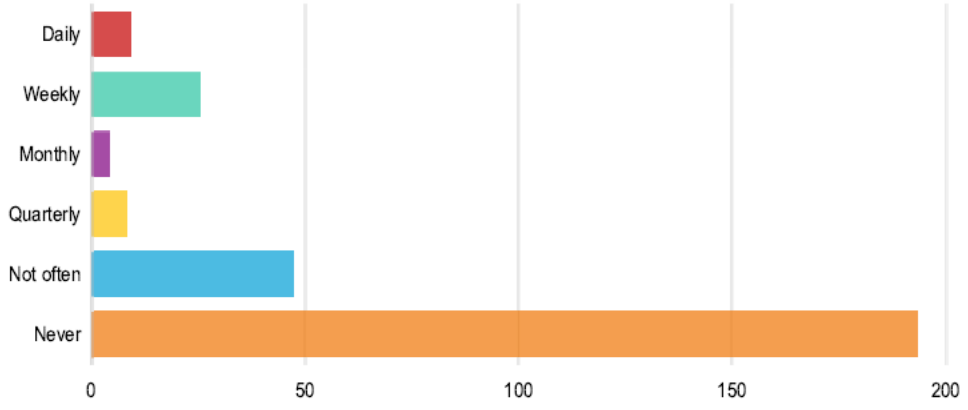
Existing Network & Community Preferences > How often do you use the following types of transportation?



Existing Network & Community Preferences

Existing Network & Community Preferences > How often do you use the following types of transportation?

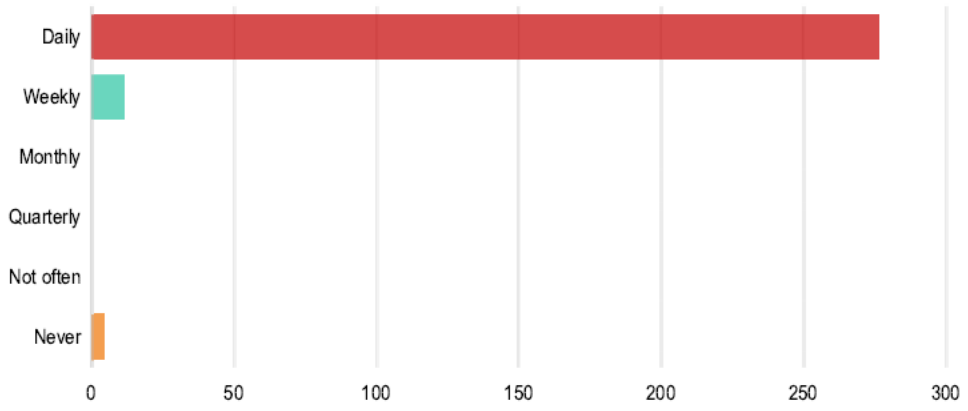
Carshare



Answered: 286 Skipped: 10

Existing Network & Community Preferences > How often do you use the following types of transportation?

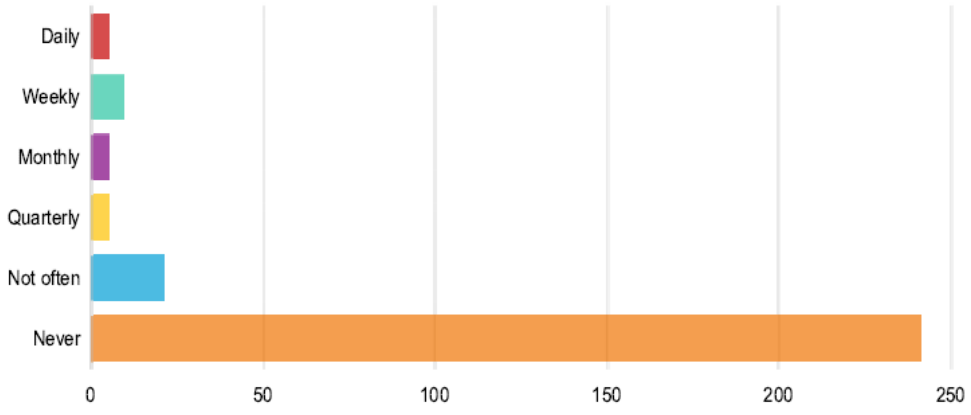
Personal car



Answered: 291 Skipped: 5

Existing Network & Community Preferences > How often do you use the following types of transportation?

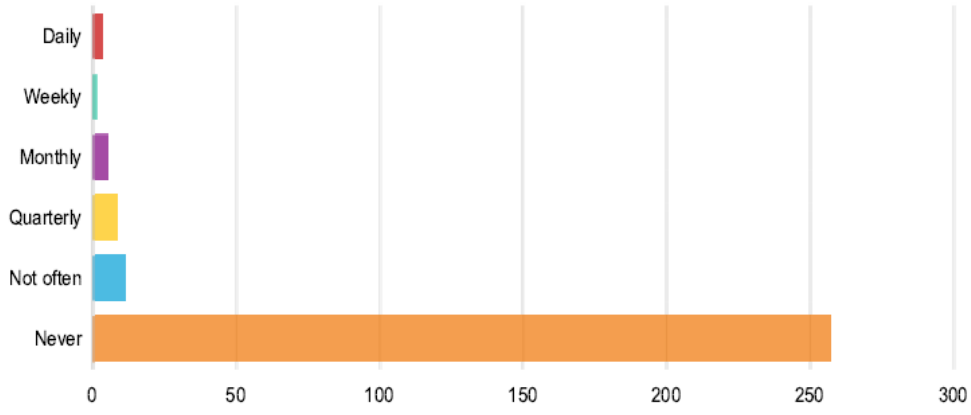
Scooter



Answered: 286 Skipped: 10

Existing Network & Community Preferences > How often do you use the following types of transportation?

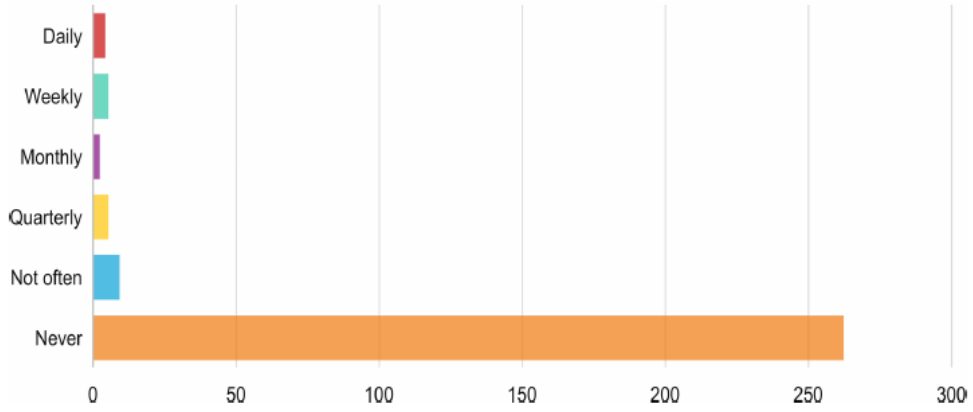
Skateboard



Answered: 285 Skipped: 11

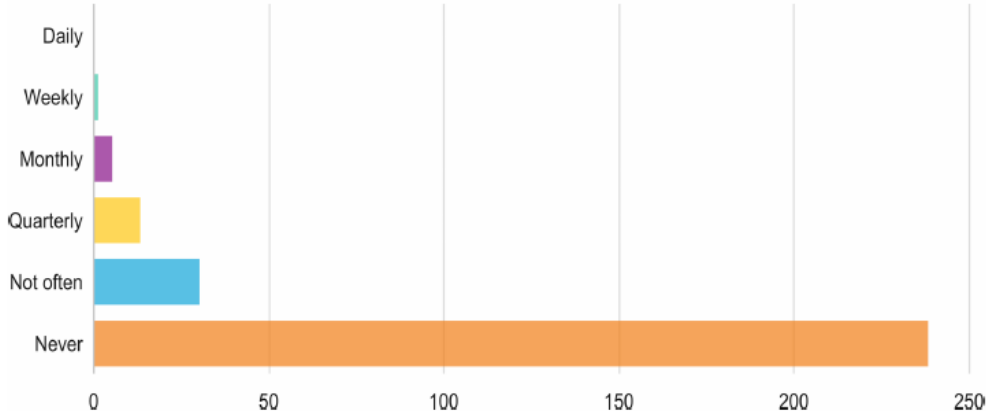
Existing Network & Community Preferences > How often do you use the following types of transportation?

Butler County Transit



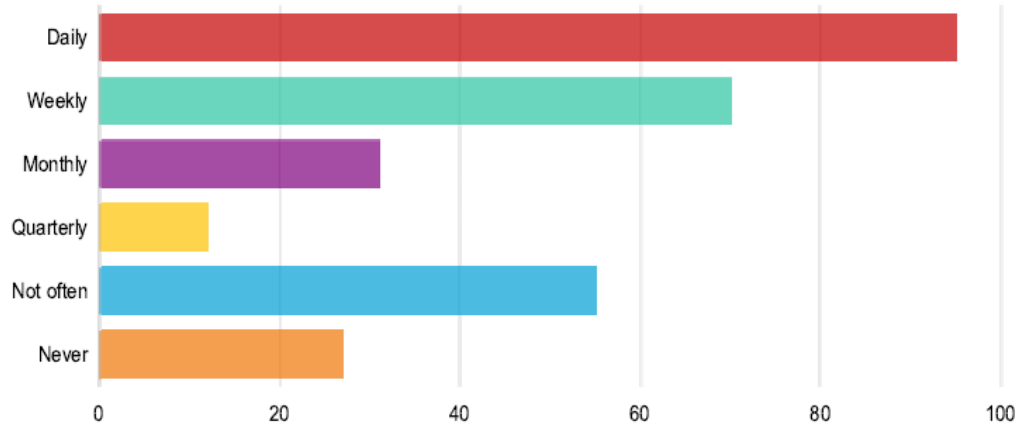
Answered: 287 Skipped: 9

Uber, Lyft, or other ride-hailing service



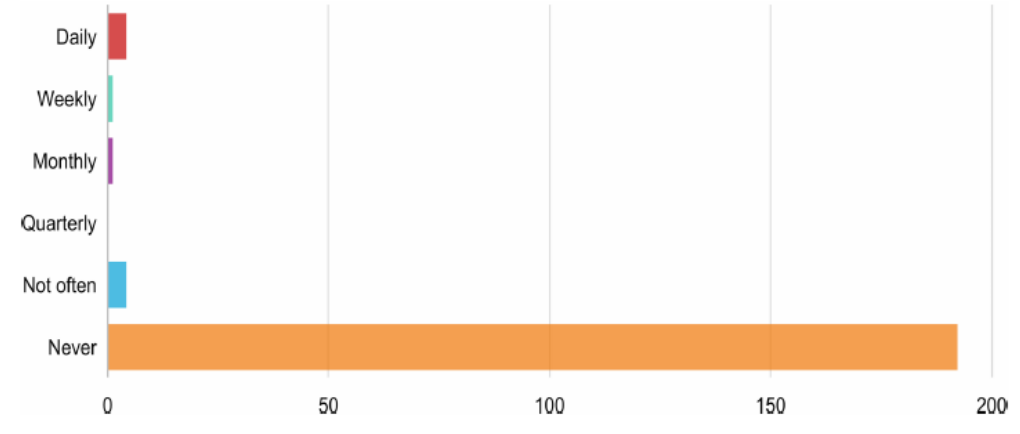
Answered: 287 Skipped: 9

Walking



Answered: 290 Skipped: 6

Other



Answered: 202 Skipped: 94

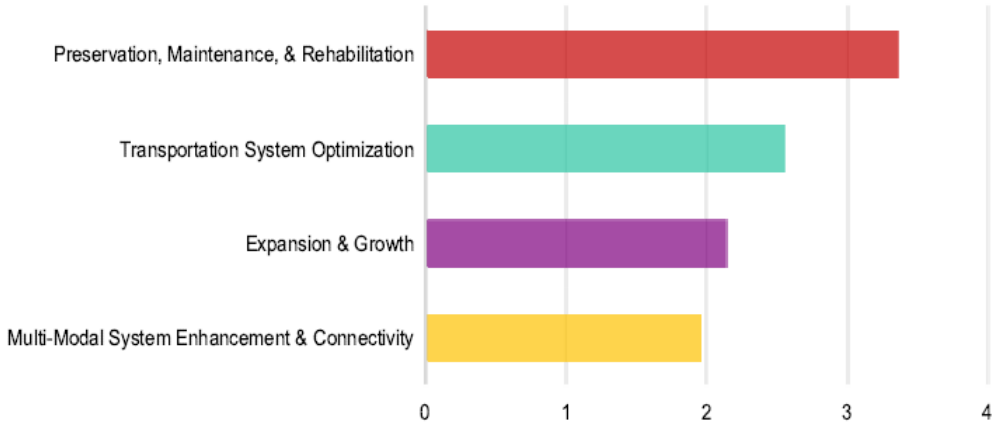
3. Rank the following criteria based on importance to you during your typical daily commute, with one (1) being most important and four (4) being least important
    a. Travel time (my commute takes the least amount of time)
    b. Safety
    c. Travel reliability (my commute is always consistent)
    d. Alternative modes of transportation (car, bike, walk, etc)

4. Based on the types of program and project focus areas provided below, please rank the following from 1 (Most Important) to 4 (Least Important) to help determine what types of transportation projects the City should prioritize investments on.

    1. _____
    2. _____
    3. _____
    4. _____

PRESERVATION, MAINTENANCE, & REHABILITATION	This focus area includes programs and projects aimed at preserving and repairing existing transportation system infrastructure. Work efforts such as expanding and improving upon pothole patching operations, milling and overlay of streets to provide smooth travel surfaces, fixing damaged pavement locations, and rehabilitation of streets and bridges are all examples of activities in this category. This category is characterized by "keeping the good streets good", and maintaining all assets proactively to take care of what we have.
TRANSPORTATION SYSTEM OPTIMIZATION	This focus area includes programs and projects that are geared towards improving operations and safety on the existing transportation network. Work efforts could include capacity improvements such as adding through lanes to street segments and addition of turn lanes and traffic control such as roundabouts or signals at existing intersections. Other examples of work can include programs to improve traffic flow through traffic signal timing updates on heavily traveled corridors and access management enhancements to improve safety on existing streets. This category is characterized by making strategic, spot improvements to existing streets and intersections to get the very best operations out of them.
MULTI-MODAL SYSTEM ENHANCEMENT & CONNECTIVITY	This focus area includes programs and projects that are implemented with the goal of improving pedestrian walkability, bicycle network connections, and transit access across the City. Types of work can include sidewalk gap infill or rehab projects, recreational trails enhancements and connectivity, and continued improvements to local transit routes and service. This category is characterized by focused investments on pedestrian and bicycle infrastructure, safe street crossings, and public transportation service for those who need it.
EXPANSION & GROWTH	This focus area includes projects to add new streets and connections in development areas and projects to reconstruct and widen rural streets and intersections to modern urban standards accommodating growing areas of the City. Typical work efforts can include reconstructing two lane rural streets to urban four lane arterial streets with new curb and gutter, and major intersection reconstruction with traffic control. These types of projects are typically focused on the new and expanding heavily traveled arterial and collector street network. This category is characterized by major construction of new infrastructure and typically requires large investments for each project.

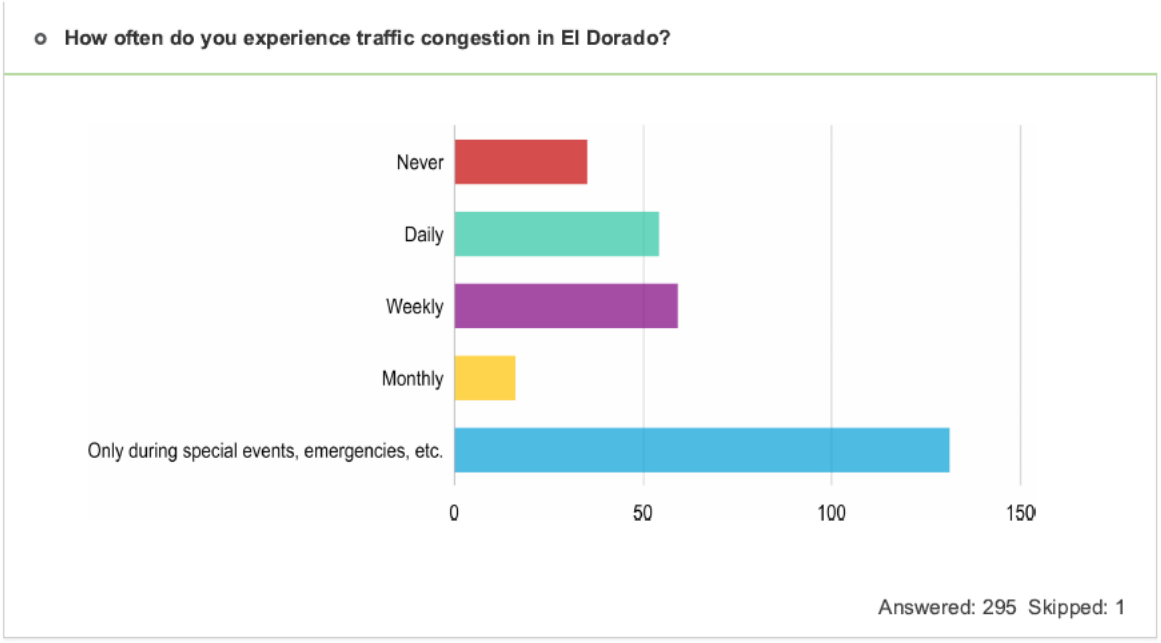
- **Based on the types of program and project focus areas provided below, please ra...**



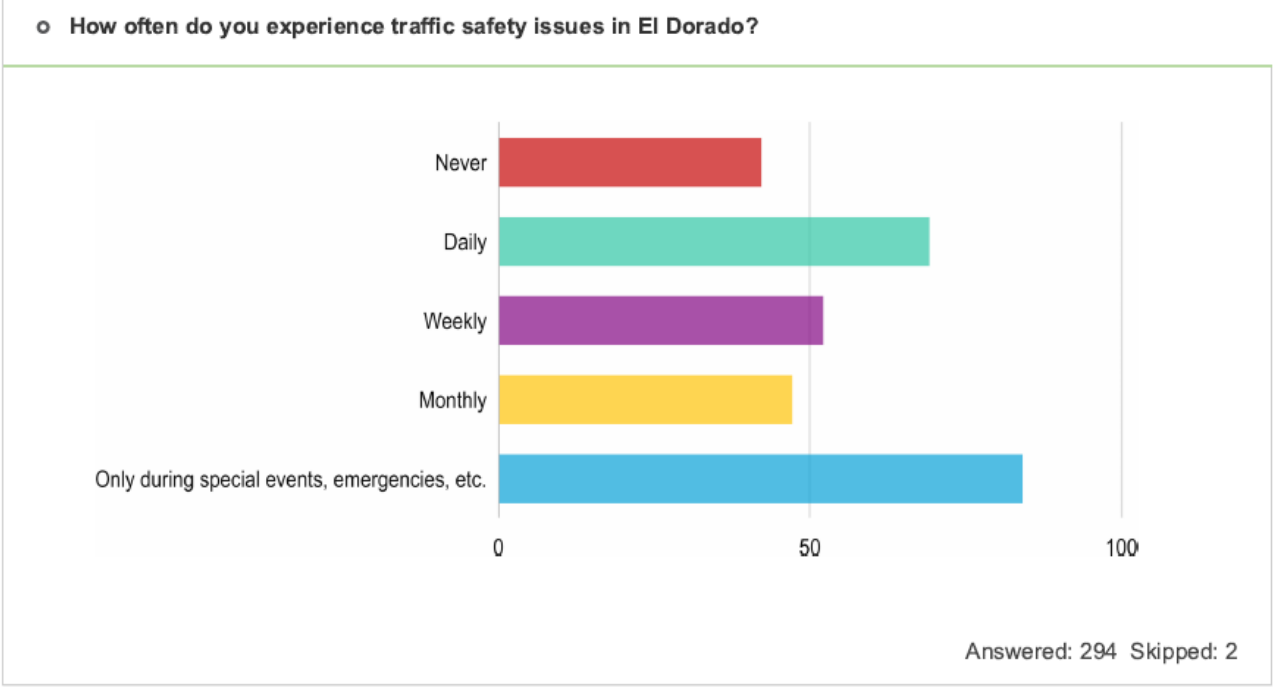
Answered: 281 Skipped: 15

Congestion/Safety

1. How often do you experience traffic congestion in El Dorado?
    a. Never
    b. Daily
    c. Weekly
    d. Monthly
    e. Only during special events, emergencies, etc.



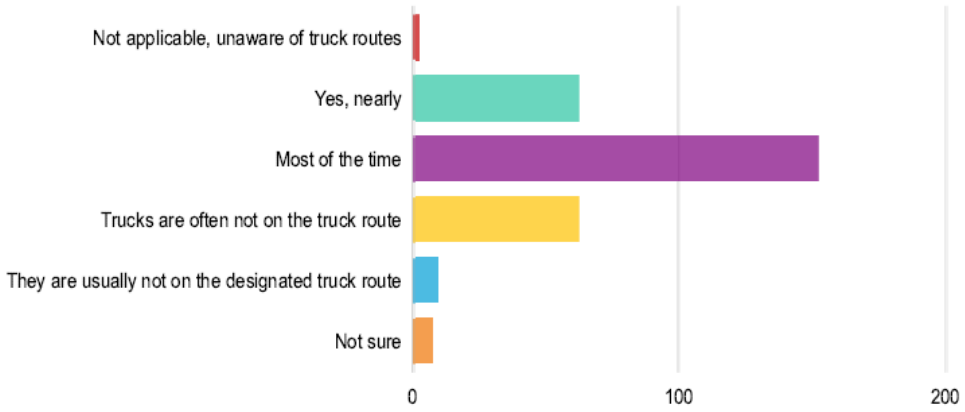
1. How often do you experience traffic safety issues in El Dorado?
    a. Never
    b. Daily
    c. Weekly
    d. Monthly
    e. Only during special events, emergencies, etc.



Trucking/Distribution Network – Truck Routes

1. In general, do you believe trucks primarily use the designated truck routes in El Dorado?
    a. Not applicable, unaware of truck routes
    b. Yes, nearly always
    c. Most of the time
    d. Trucks are often not on the truck route
    e. They are usually not on the designated truck route
    f. Not sure

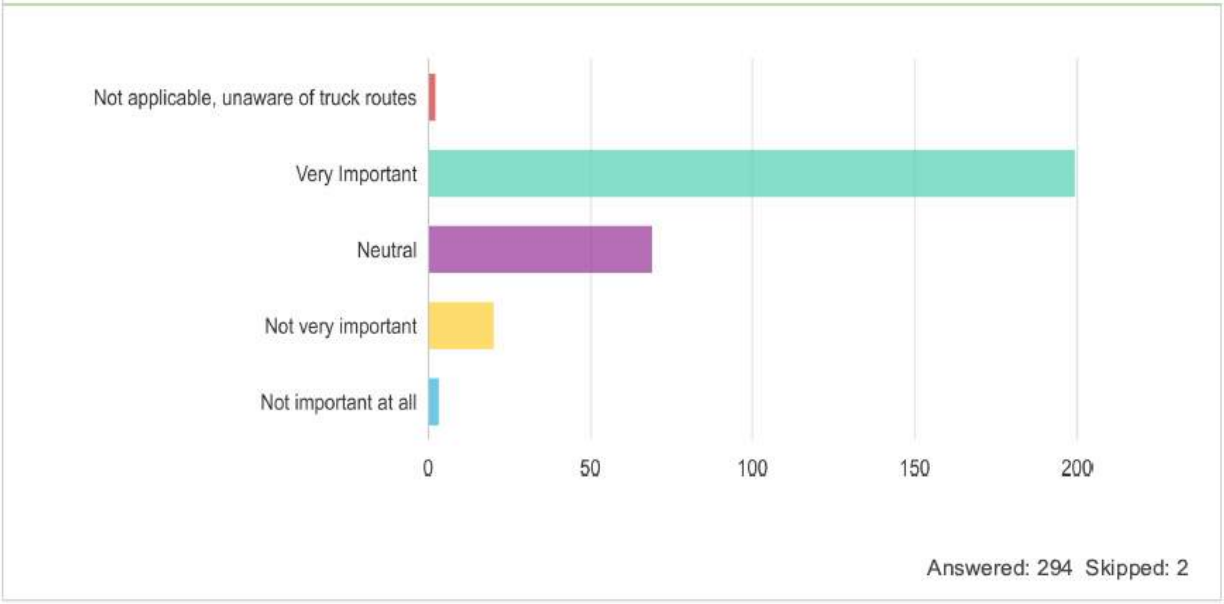
In general, do you believe trucks primarily use the designated truck routes in El…



Answered: 294 Skipped: 2

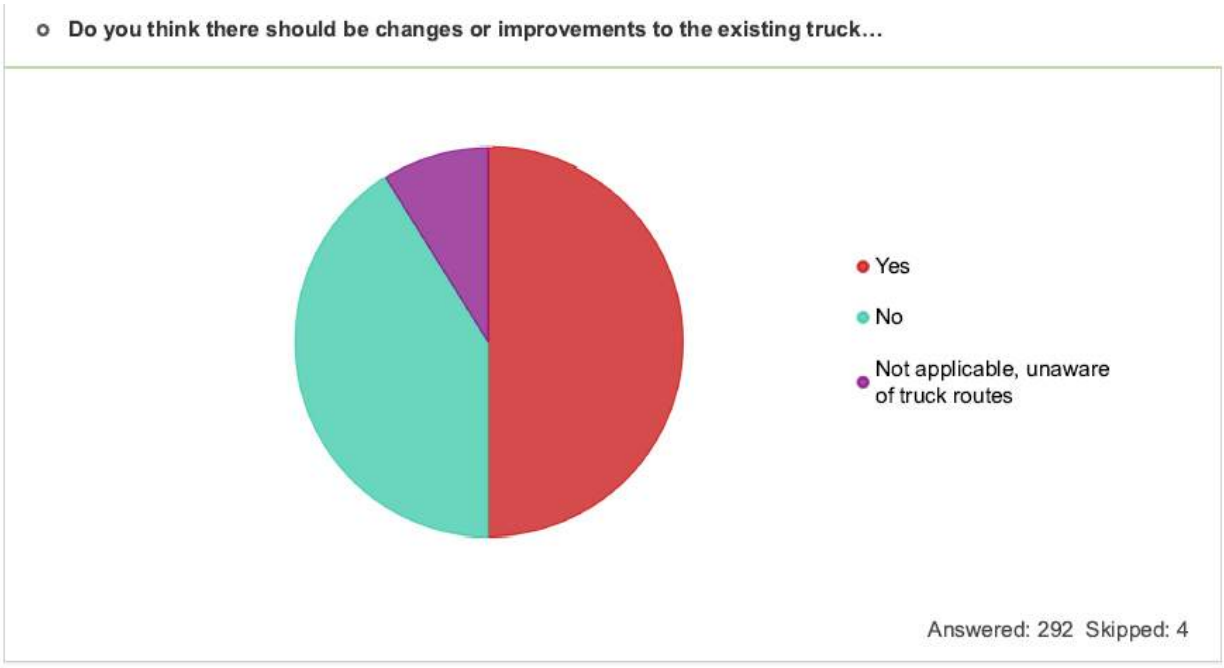
1. How important is the proper use of the truck routes by large trucks?
    a. Not applicable, unaware of truck routes
    b. Very important
    c. Somewhat important
    d. Neutral
    e. Not very important
    f. Not important at all

How important is the proper use of the truck routes by large trucks?



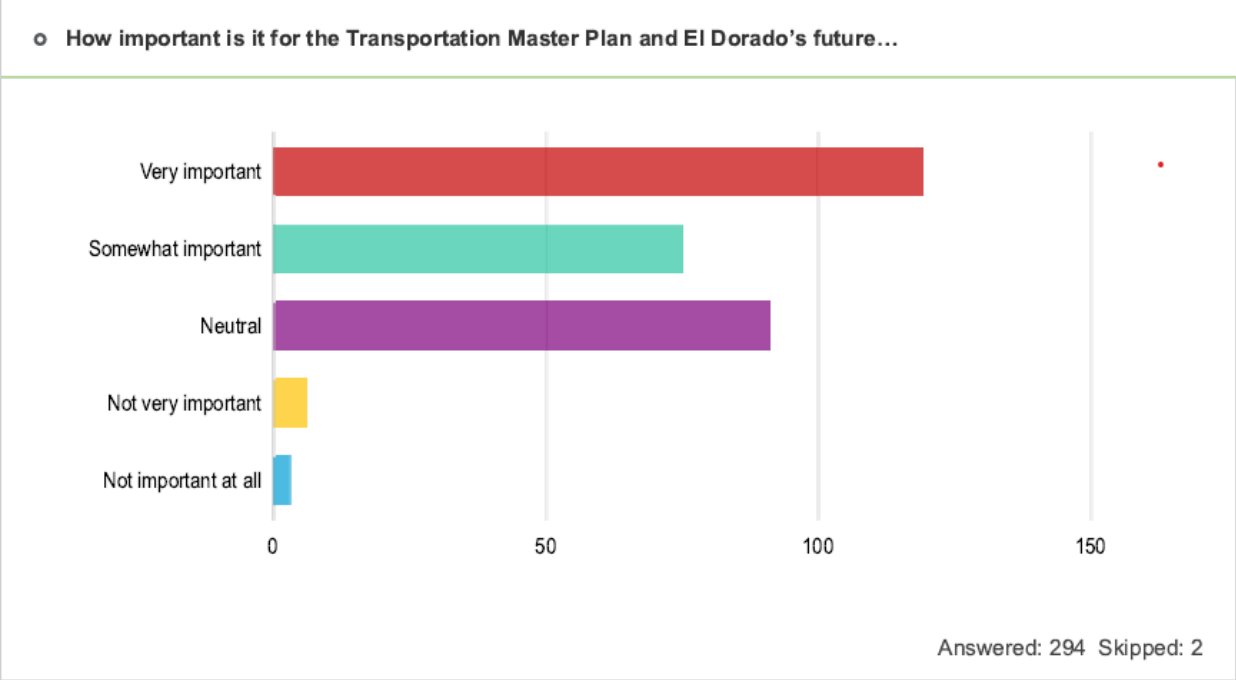
1. Do you think there should be changes or improvements to the existing truck routes in El Dorado? If yes, please specify.
    a. Not applicable, unaware of truck routes
    b. Yes
    c. No

Do you think there should be changes or improvements to the existing truck...

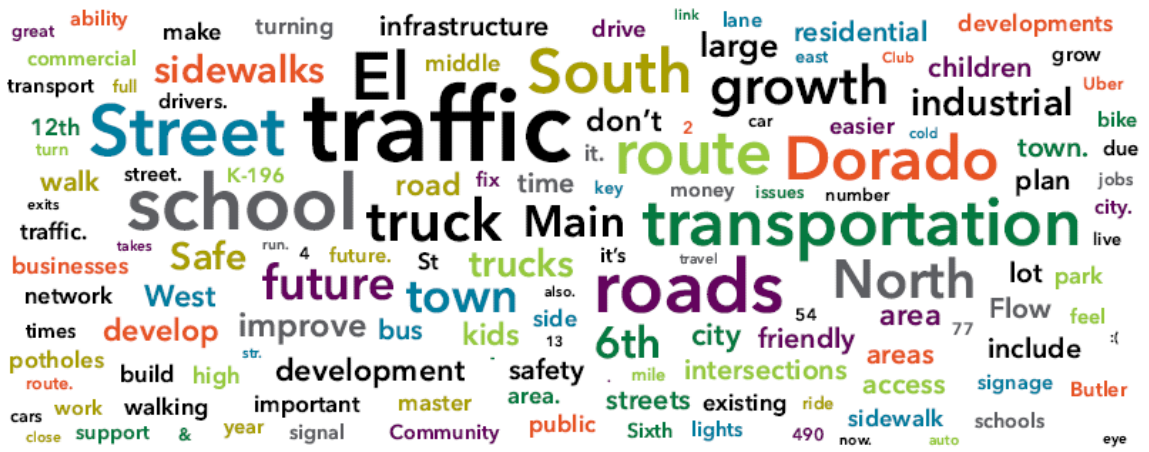


Development Friendly

1. How important is it for the Transportation Master Plan and El Dorado's future transportation system growth to be development (residential, commercial and industrial) friendly? If you answer 'Very Important' or 'Somewhat Important' please provide specific feedback on the existing transportation network, and any suggested improvements to enhance the network in support of growth and development in El Dorado.
    a. Very important
    b. Somewhat important
    c. Neutral
    d. Not very important
    e. Not important at all



Provide specific feedback on the existing transportation network and any suggested...



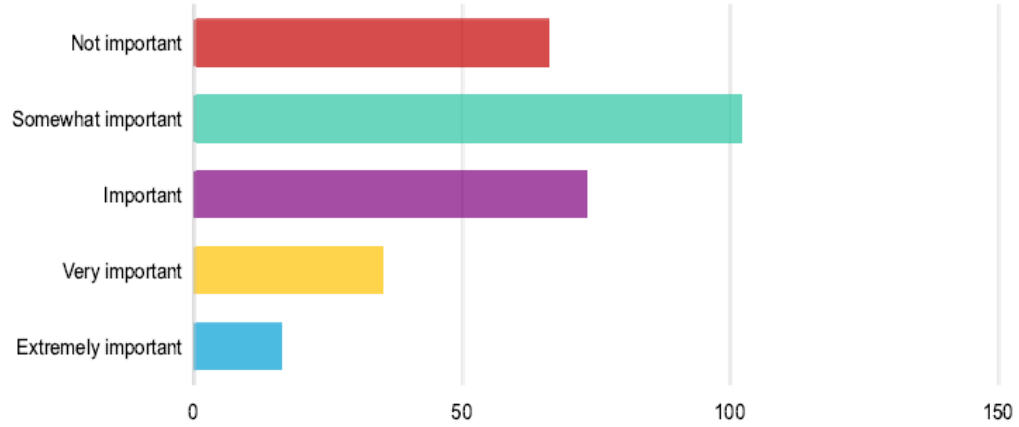
Answered: 92 Skipped: 204

Multi-Modal Transportation refers to areas in the transportation network that support the needs of all transportation network users, whether they choose to walk, bike, use public transit, or drive. Bike lanes adjacent to streets, and sidewalks adjacent to streets, are examples of multi-modal transportation

1. How important are the following improvements?
   Choices: Not important, somewhat important, important, very important, extremely important
   a. Widen major streets
   b. Maintenance of existing transportation facilities (e.g., streets, bridges, sidewalks, trails, etc.)
   c. Intersection improvements with ADA compliant pedestrian accommodations
   d. Improve timing of traffic signals
   e. More bike lanes and/or trails
   f. More sidewalks

Multi-Modal Transportation > How important are the following improvements?

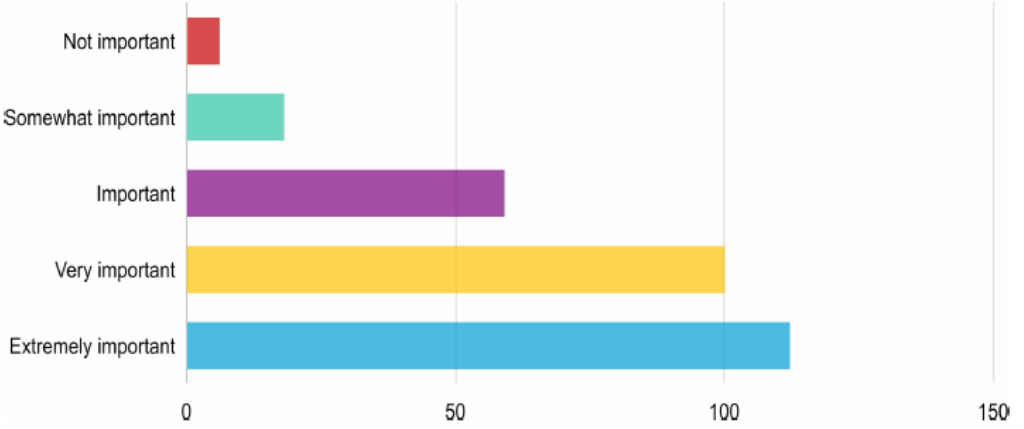
Widen major streets



Answered: 292 Skipped: 4

Multi-Modal Transportation > How important are the following improvements?

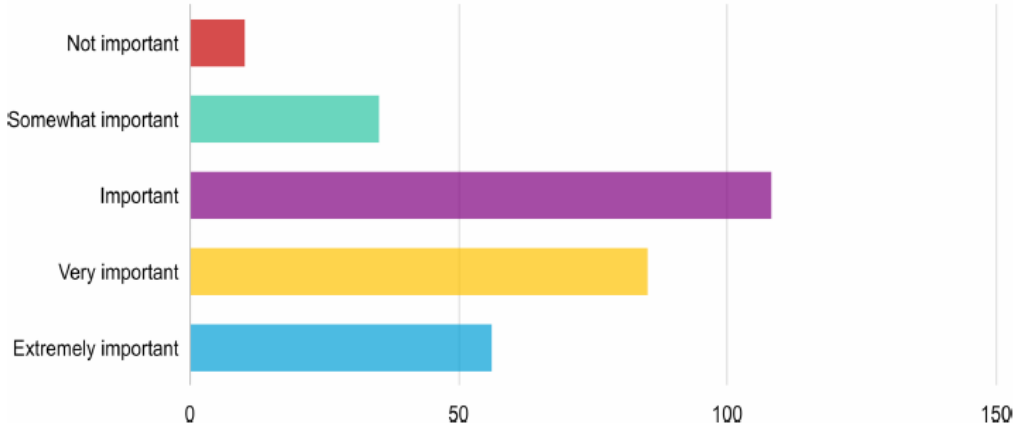
Maintenance of existing transportation facilities (e.g. streets, bridges,...



Answered: 295 Skipped: 1

Multi-Modal Transportation > How important are the following improvements?

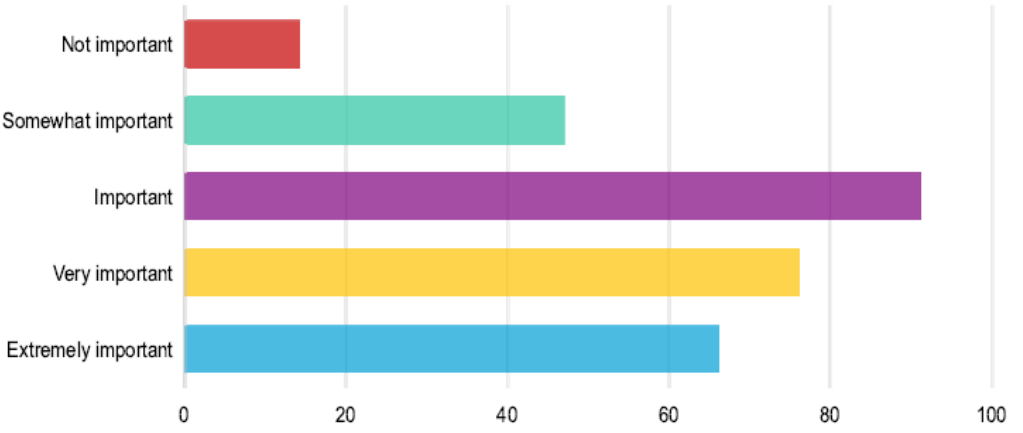
Intersection improvements with ADA compliant pedestrian accommodations



Answered: 294 Skipped: 2

Multi-Modal Transportation > How important are the following improvements?

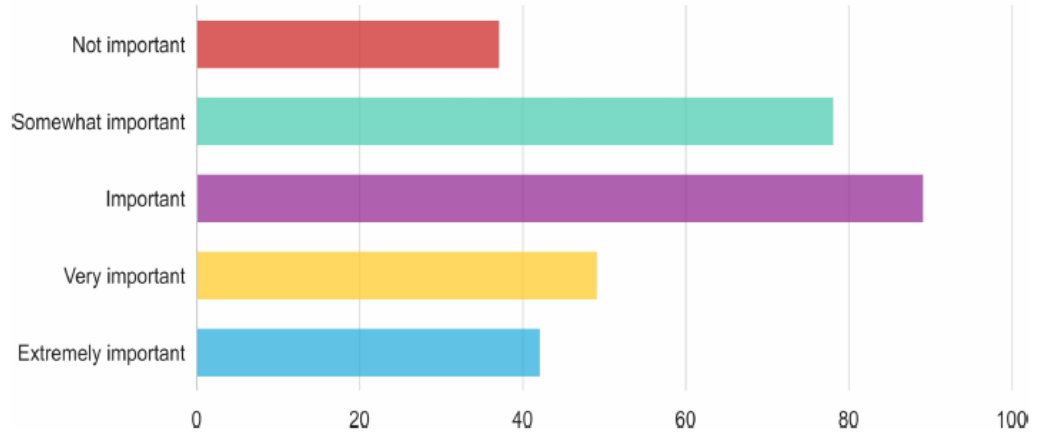
Improve timing of traffic signals



Answered: 294 Skipped: 2

Multi-Modal Transportation > How important are the following improvements?

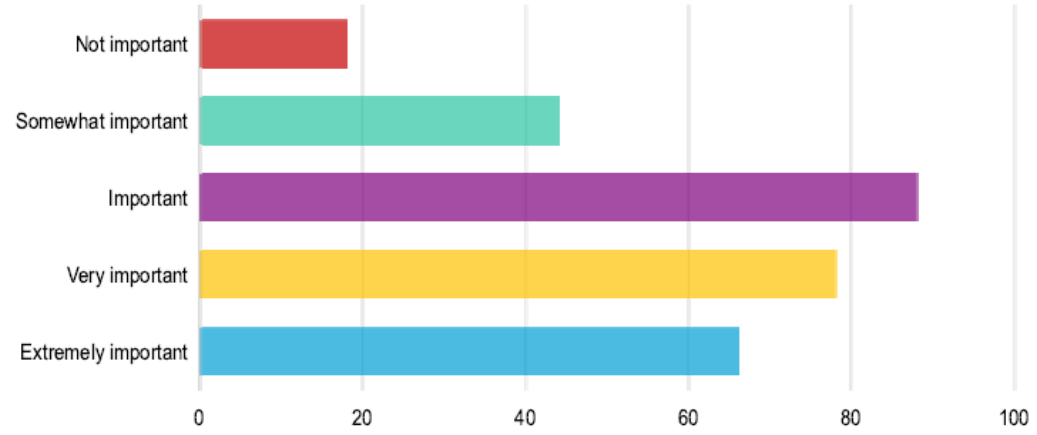
More bike lanes and/or trails



Answered: 295 Skipped: 1

Multi-Modal Transportation > How important are the following improvements?

More sidewalks

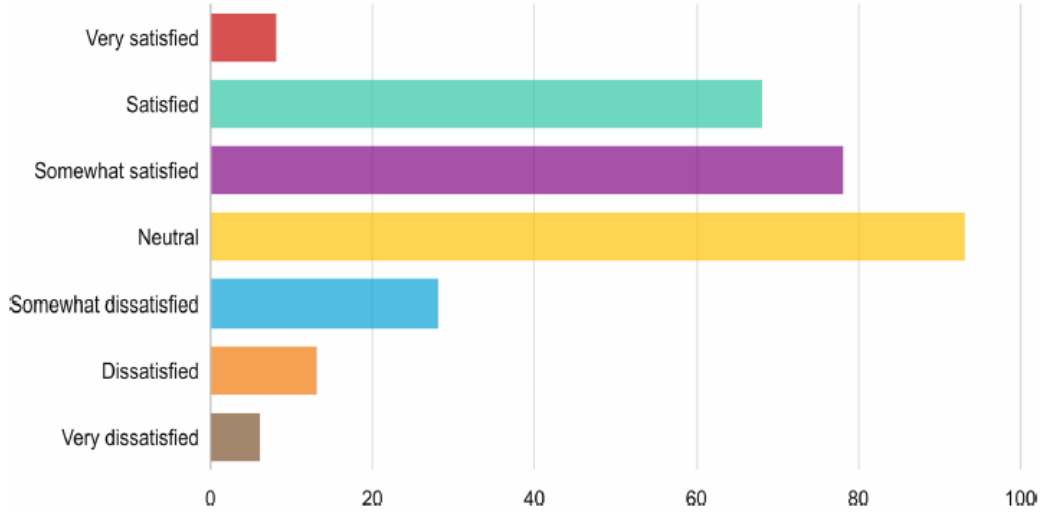


Answered: 294 Skipped: 2

1. Please rate your satisfaction with the current multi-modal transportation network offerings in El Dorado.

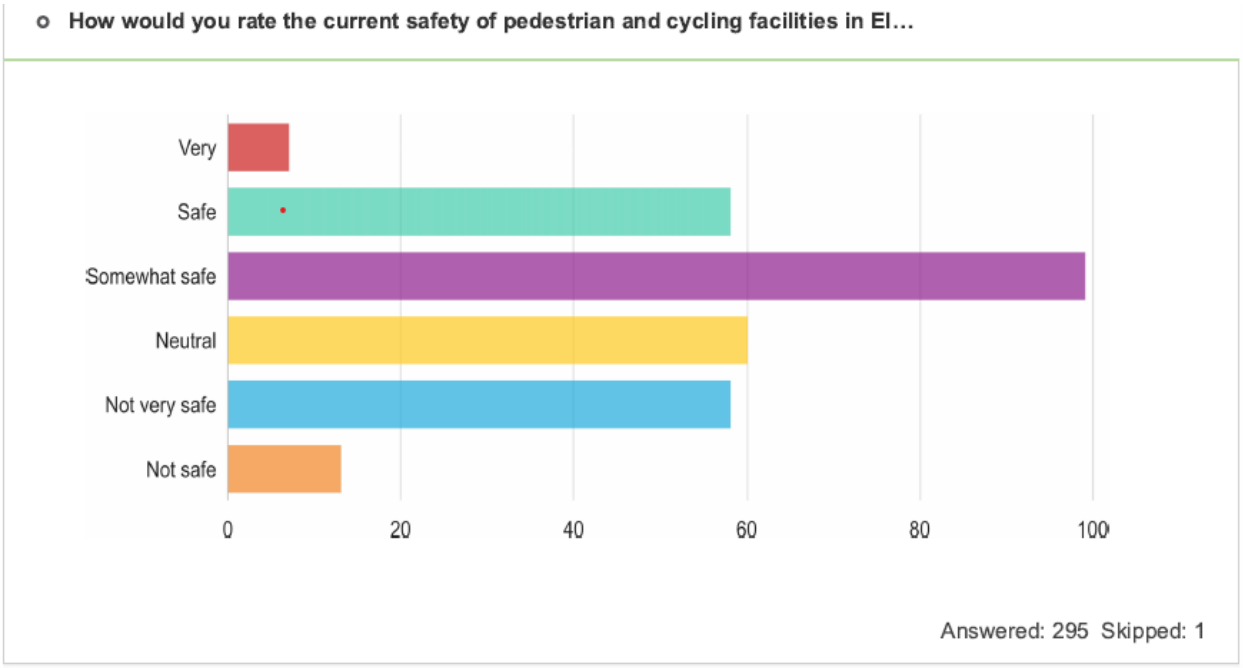
    a. Very satisfied
    b. Satisfied
    c. Somewhat satisfied
    d. Neutral
    e. Somewhat dissatisfied
    f. Dissatisfied
    g. Very Dissatisfied

Please rate your satisfaction with the current multi-modal transportation networ…

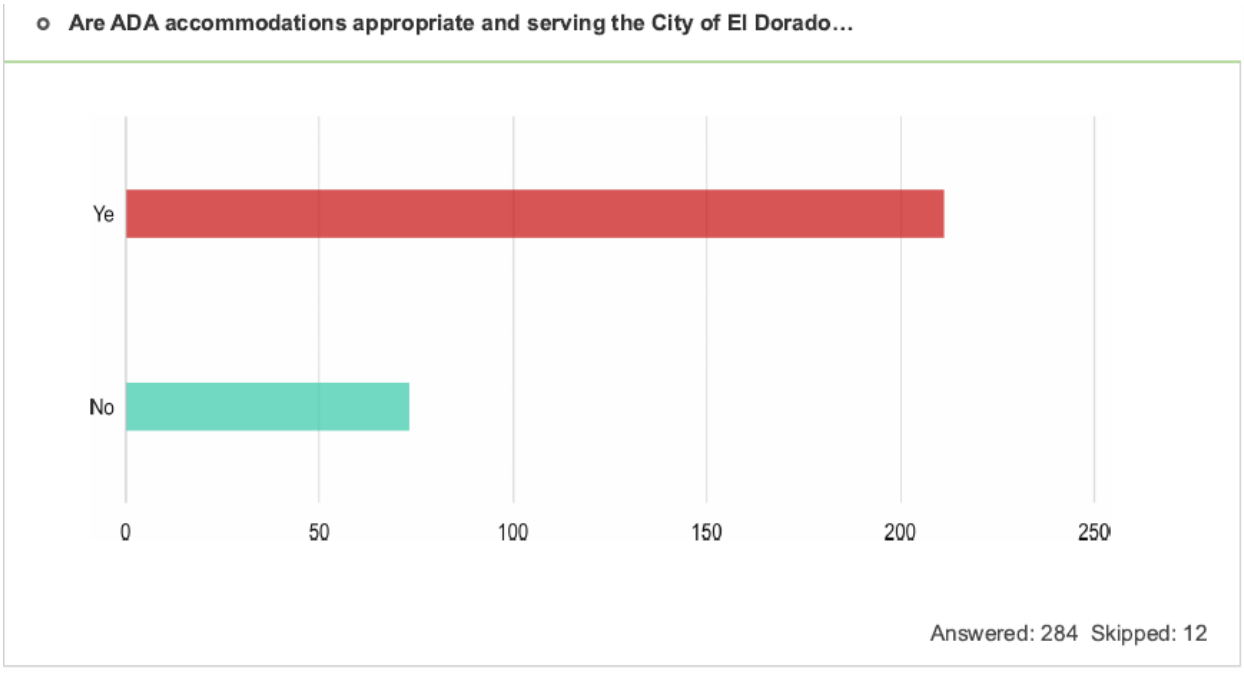


Answered: 294 Skipped: 2

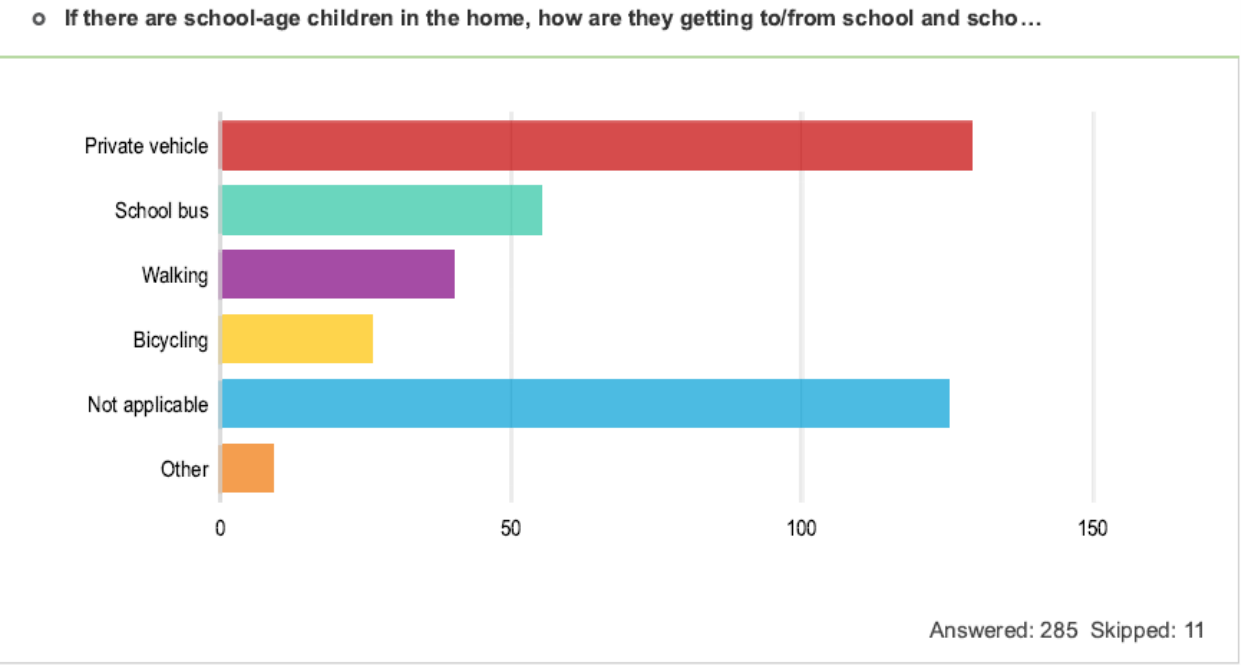
1. How would you rate the current safety of pedestrian and cycling facilities in El Dorado?
    a. Very safe
    b. Safe
    c. Somewhat safe
    d. Neutral
    e. Not very safe
    f. Not safe



1. Are ADA accommodations appropriate and serving the City of El Dorado properly? Accommodations include but are not limited to accessibility for mobility device users, the hearing or visually impaired, and parking accessibility etc. If you answer no, please provide specific feedback on needed ADA accommodation improvements in El Dorado's transportation network.
    a. Yes
    b. No



2. If there are school-age children in the home, how are they getting to/from school and/or school activities? Please check all that apply. If you selected 'Other' please specify.
    a. Private vehicle
    b. School bus
    c. Walking
    d. Bicycling
    e. Other
    f. Not applicable

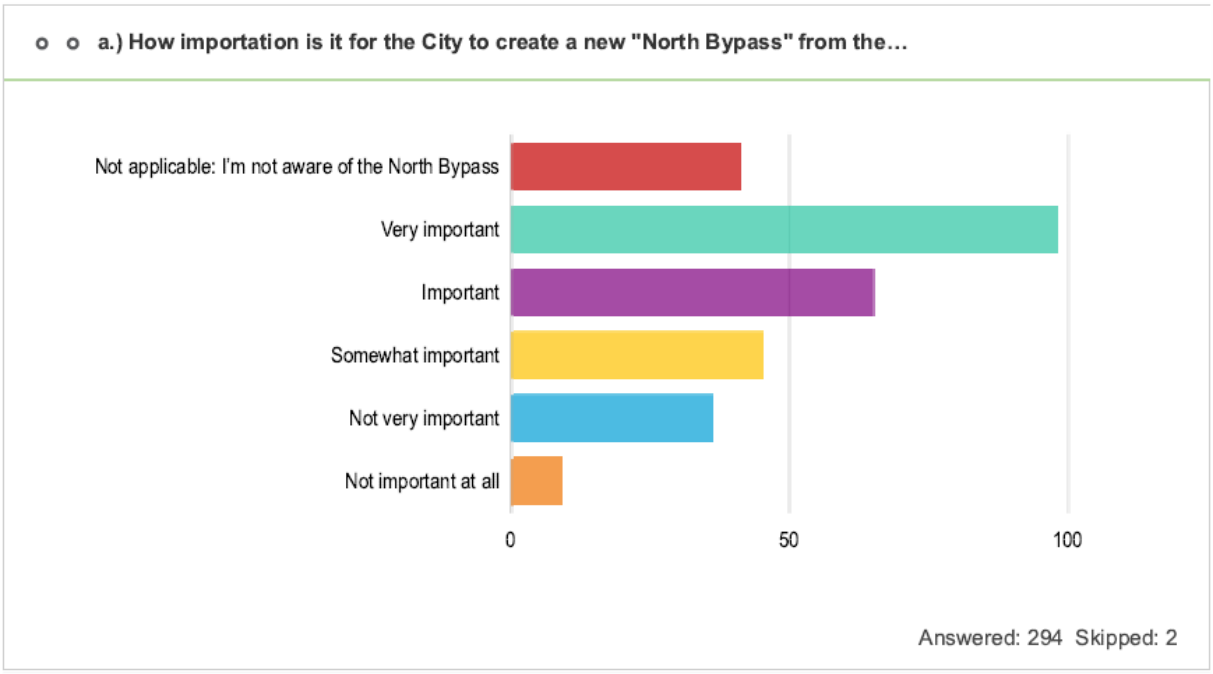


North & South Bypass

1. The purpose of the North Bypass concept/project is to facilitate heavy truck movement and large-scale industrial growth and investment in El Dorado. How importation is it for the City to create a new 'North Bypass' from the intersection of N. Haverhill Rd. and Oil Hill Rd. to the intersection of N. Main St. and McCollum Rd.? Why or why not?
    a. Not applicable: I'm not aware of the North Bypass
    b. Very important
    c. Important
    d. Somewhat important
    e. Not very important

f. Not important at all

North & South Bypass > The purpose of the North Bypass concept/project is to facilitate heavy truck movement and large-scale industrial growth and investment in El Dorado.



2. The purpose of the South Bypass is to complete the truck detour/route and facilitate moving heavy truck traffic away from Central and Main. How important is it for the City to complete the South Bypass by connecting the intersection of SW 10th St., and SW Purity Springs Dr., with the intersection of S. Haverhill Rd., and SW Traffic Way?

a. Not applicable: I'm not aware of the South Bypass

b. Very important

c. Important

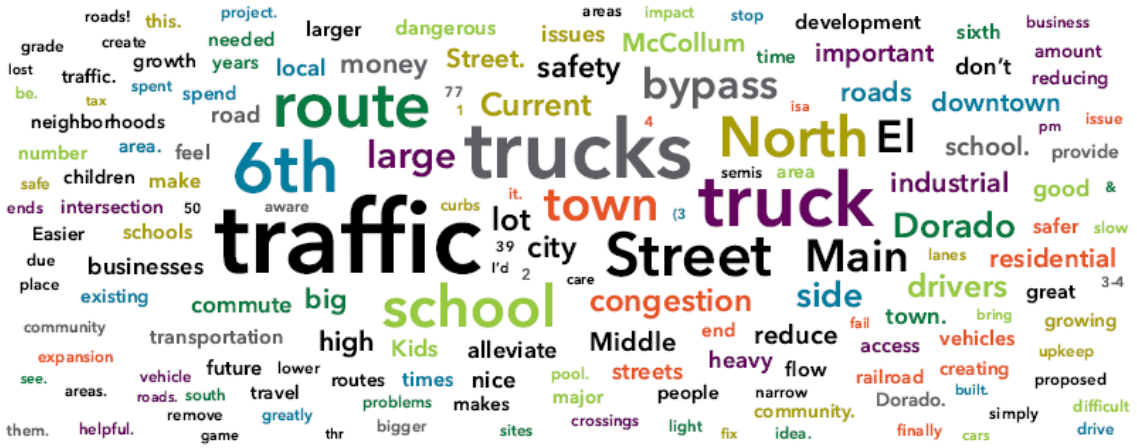
d. Somewhat important

e. Not very important

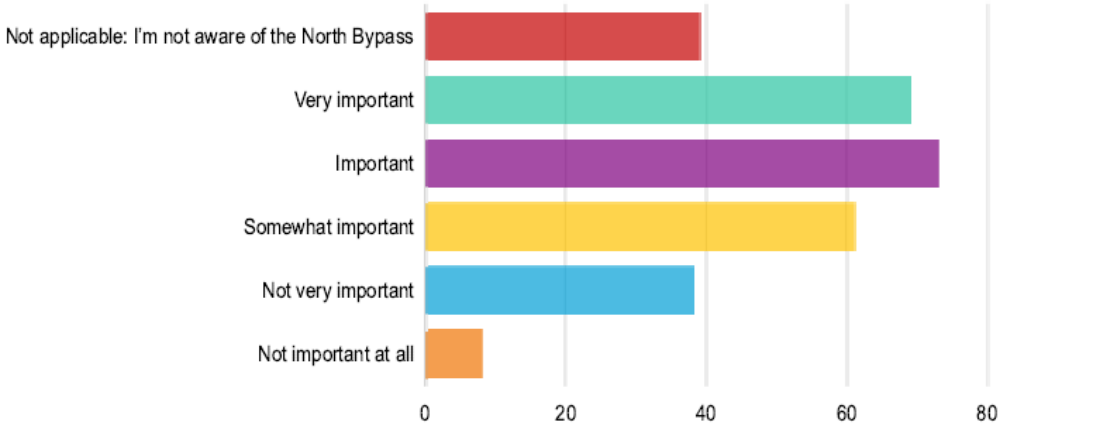
f. Not important at all

North & South Bypass > The purpose of the North Bypass concept/project is to facilitate heavy truck movement and large-scale industrial growth and investment in El Dorado.

o o b.) Why or why not?



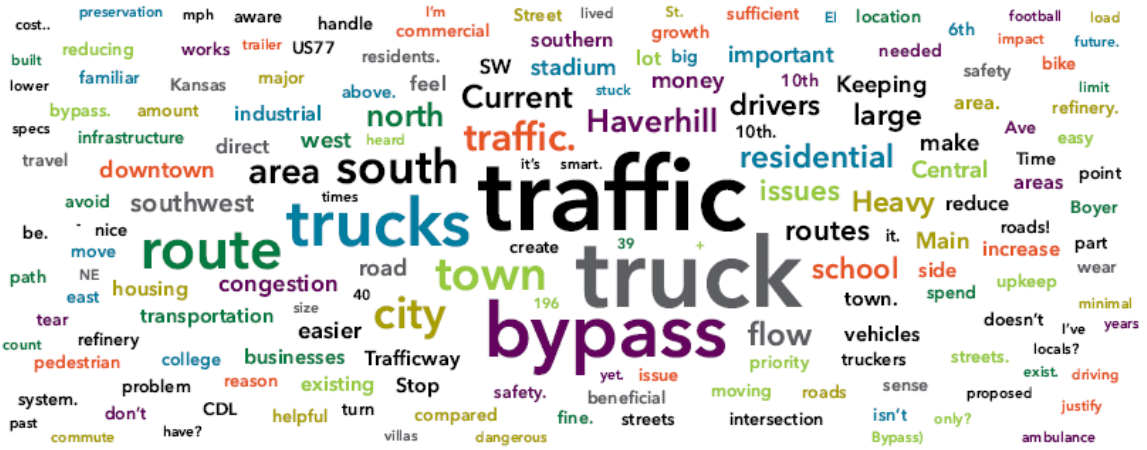
o o a.) How importation is it for the City to complete the South Bypass by…



Answered: 288 Skipped: 8

North & South Bypass > The purpose of the South Bypass is to complete the truck detour/route and facilitate moving heavy truck traffic away from Central and Main.

o o b.) Why or why not?



APPENDIX B

Traffic Analysis

STREETLIGHT DATA

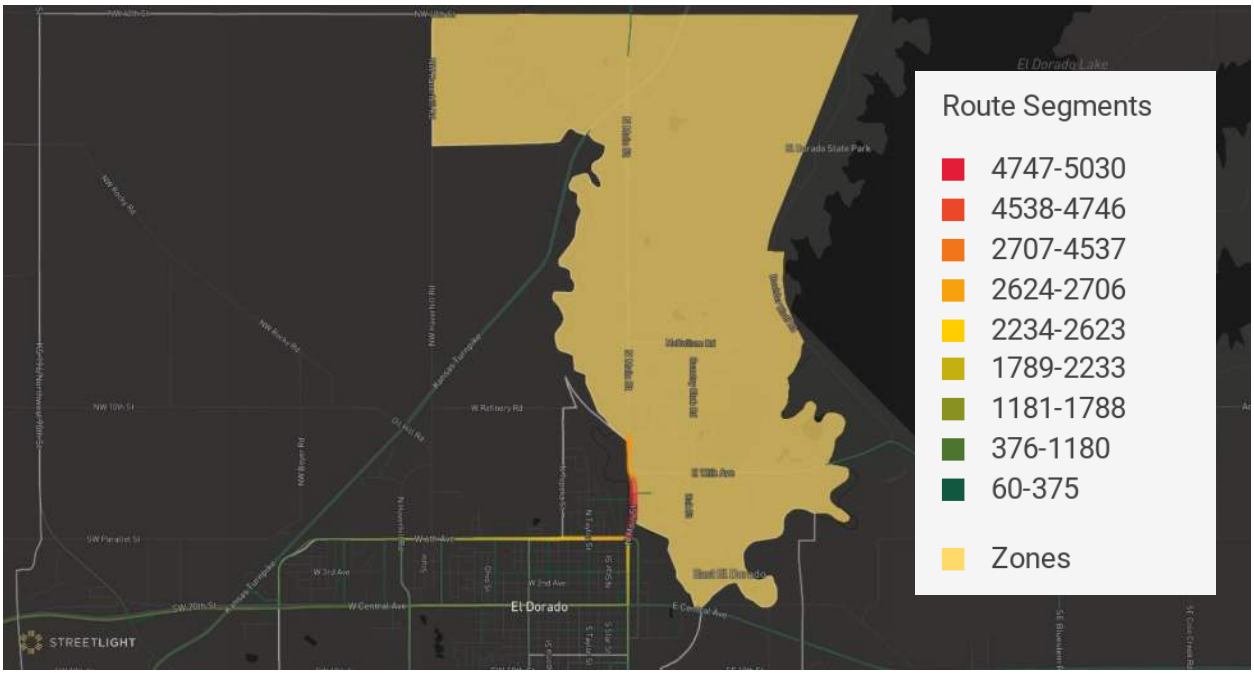
StreetLight Data leverages various sources, including anonymized location data from mobile devices, GPS units, and other sensors, to gather and analyze traffic volume on roads and streets. This data is aggregated and can be dissected into different time intervals—hourly, daily, or monthly—allowing for an in-depth examination of traffic patterns and trends.

The area in and around the City of El Dorado was divided into 12 zones. The following pages display the daily traffic flows entering and exiting each zone, along with the primary streets utilized by most vehicles.

Daily Inbound Traffic to Zone 1 (ADT Levels)

Daily Outbound Traffic from Zone 1 (ADT Levels)

Daily Inbound Traffic to Zone 2 (ADT Levels)

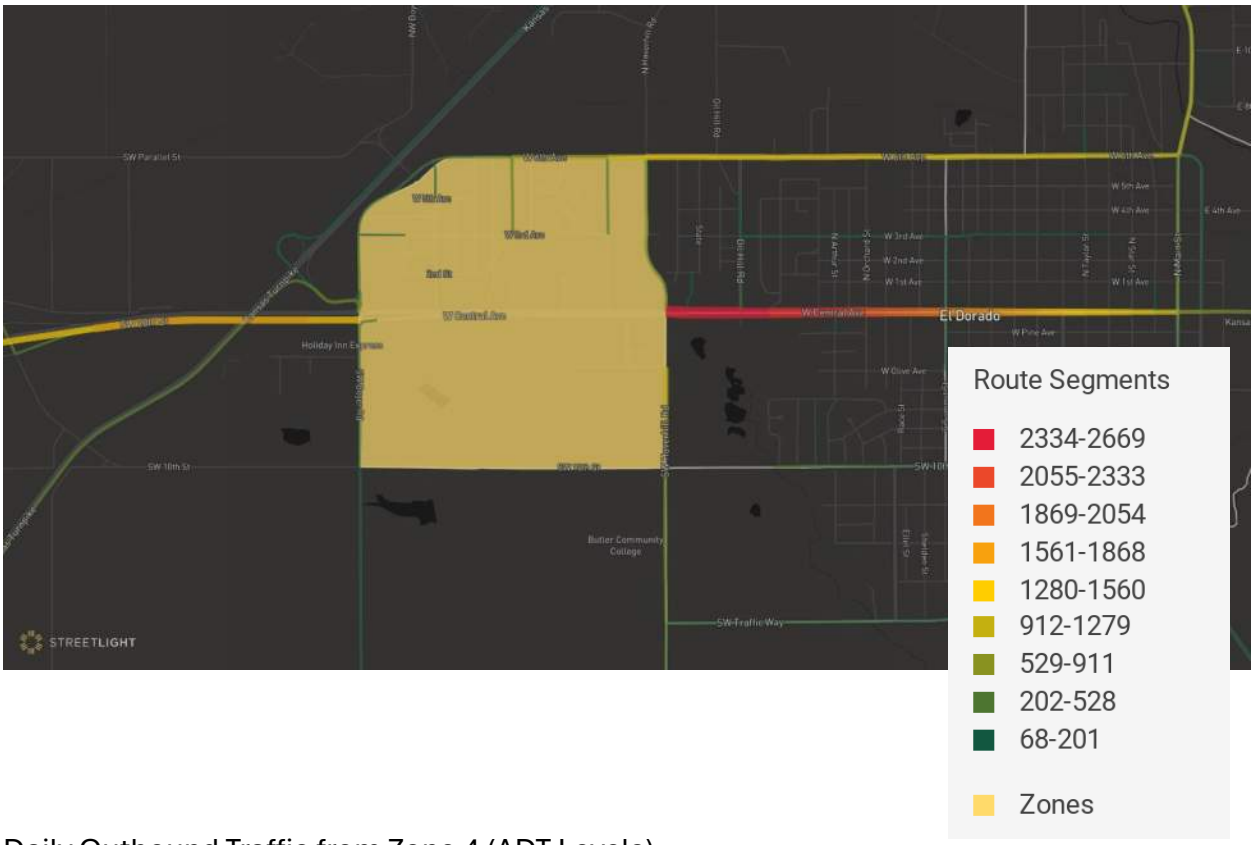


Daily Outbound Traffic from Zone 2 (ADT Levels)

Daily Inbound Traffic to Zone 3 (ADT Levels)

Daily Outbound Traffic from Zone 3 (ADT Levels)

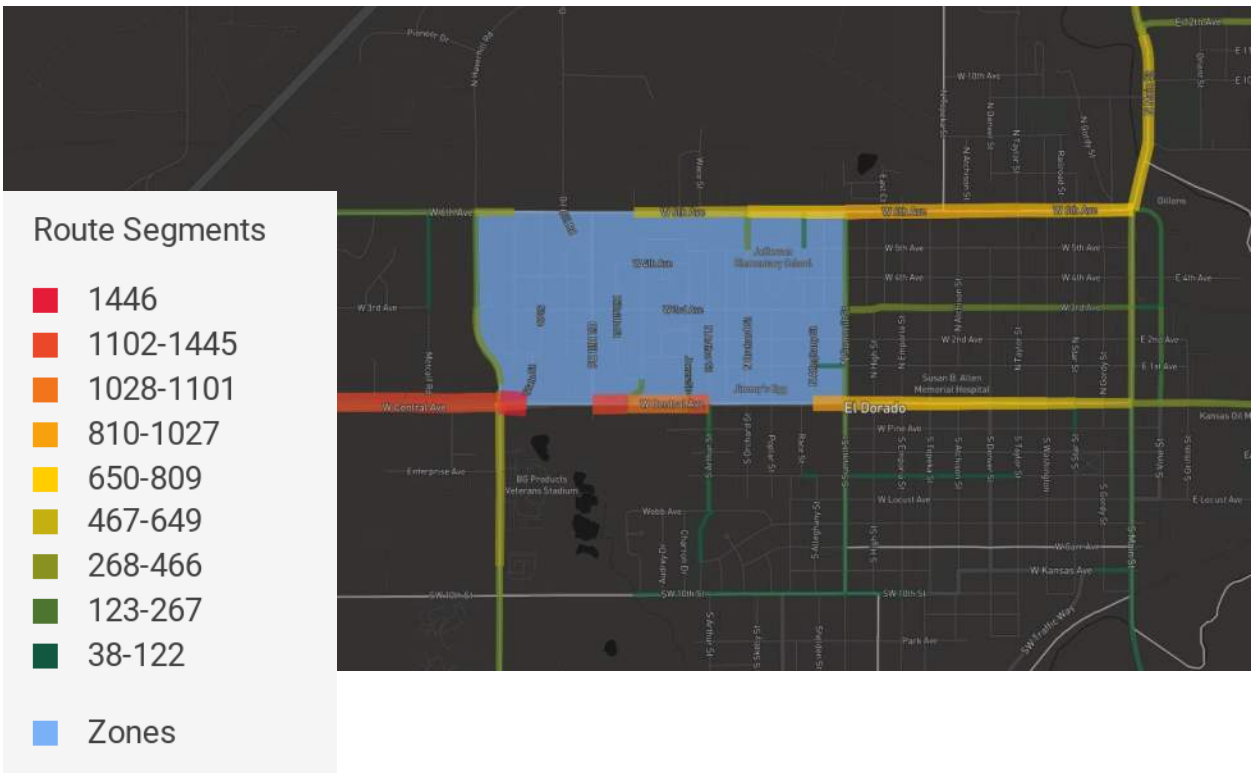
Daily Inbound Traffic to Zone 4 (ADT Levels)



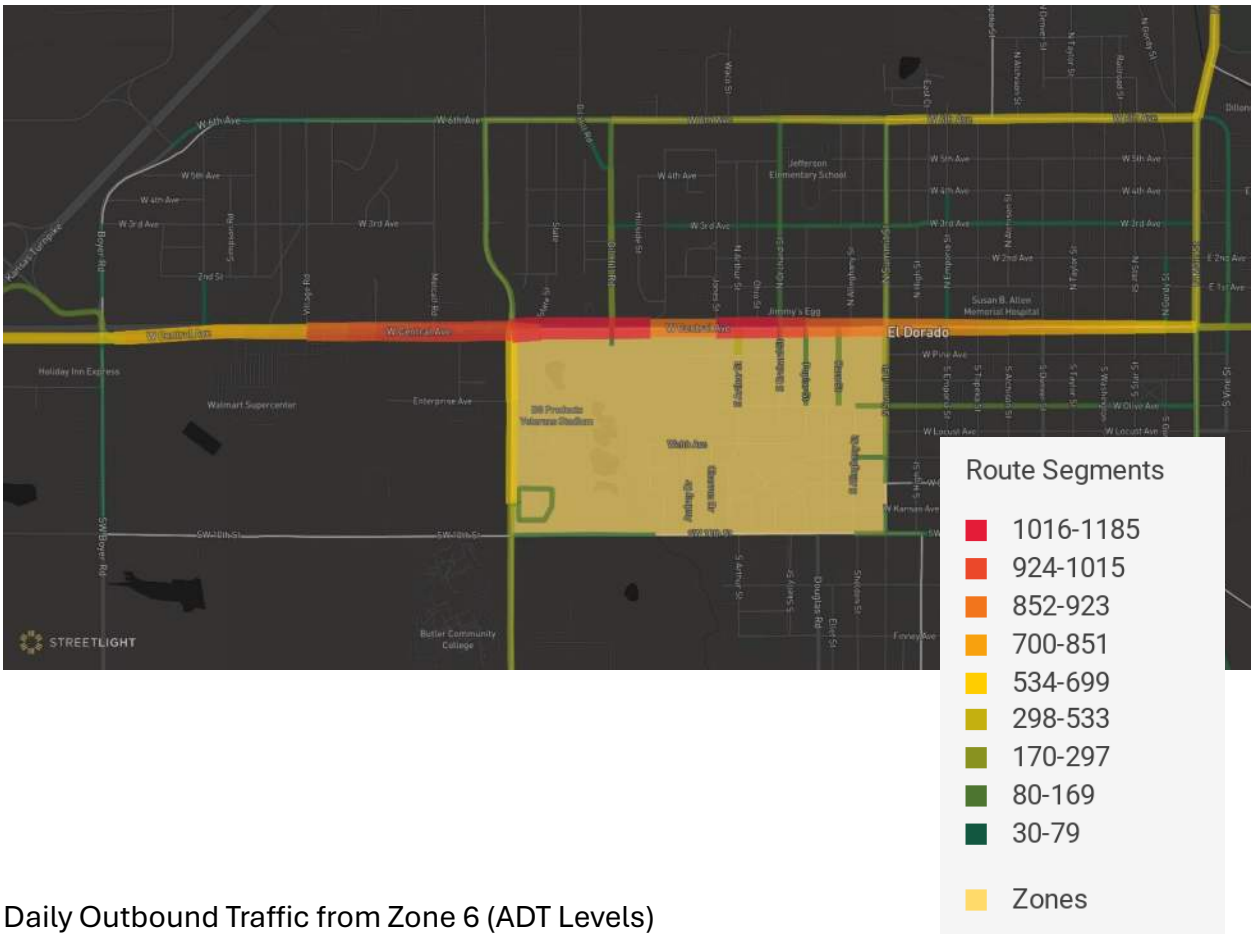
Daily Outbound Traffic from Zone 4 (ADT Levels)

Daily Inbound Traffic to Zone 5 (ADT Levels)

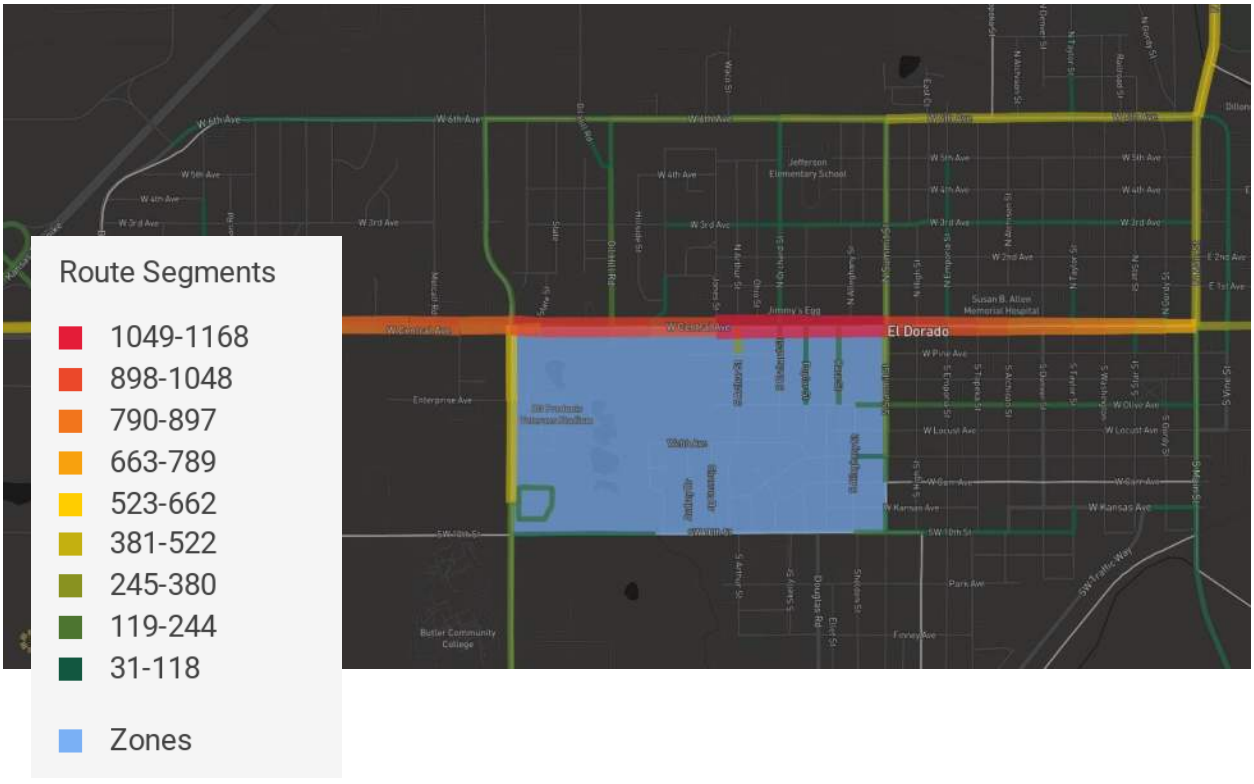
Daily Outbound Traffic from Zone 5 (ADT Levels)



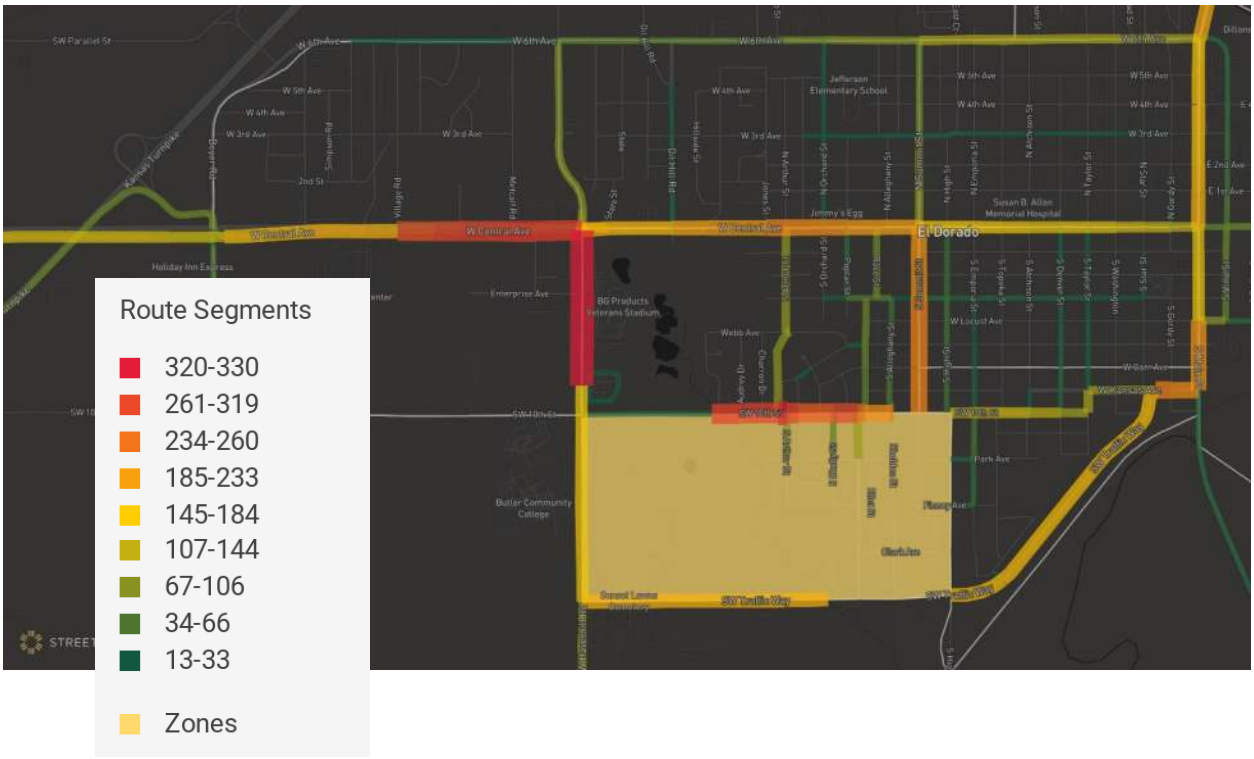
Daily Inbound Traffic to Zone 6 (ADT Levels)



Daily Outbound Traffic from Zone 6 (ADT Levels)

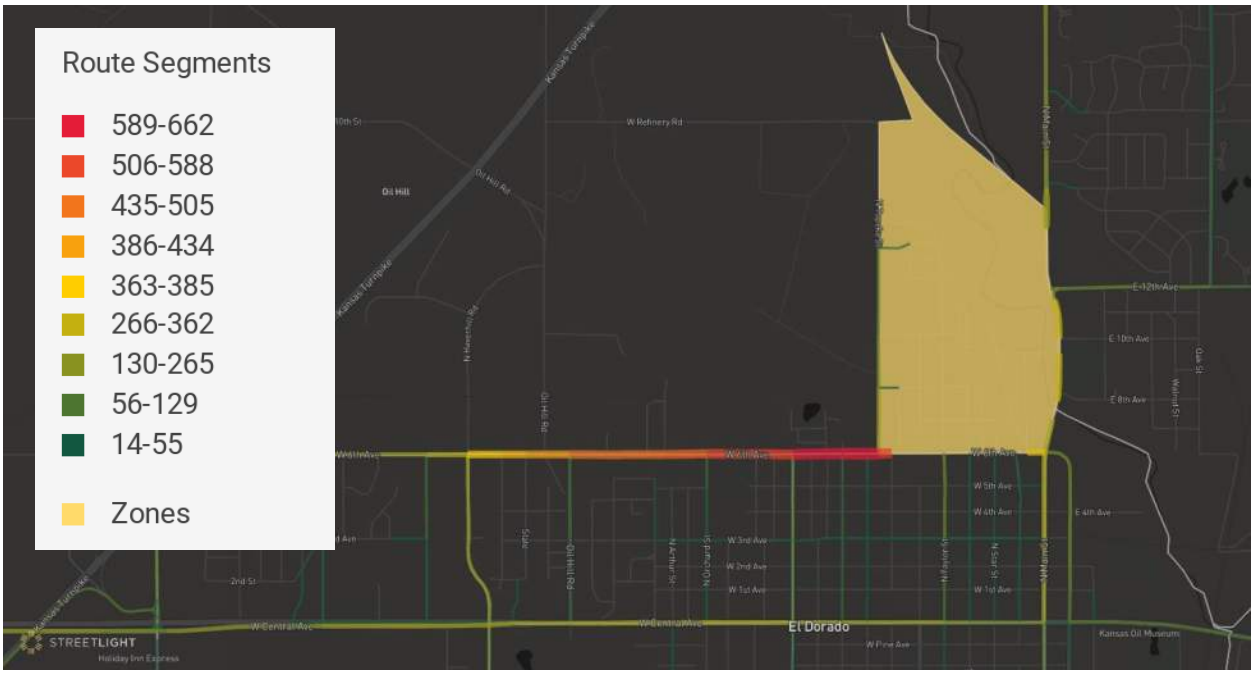


Daily Inbound Traffic to Zone 7 (ADT Levels)

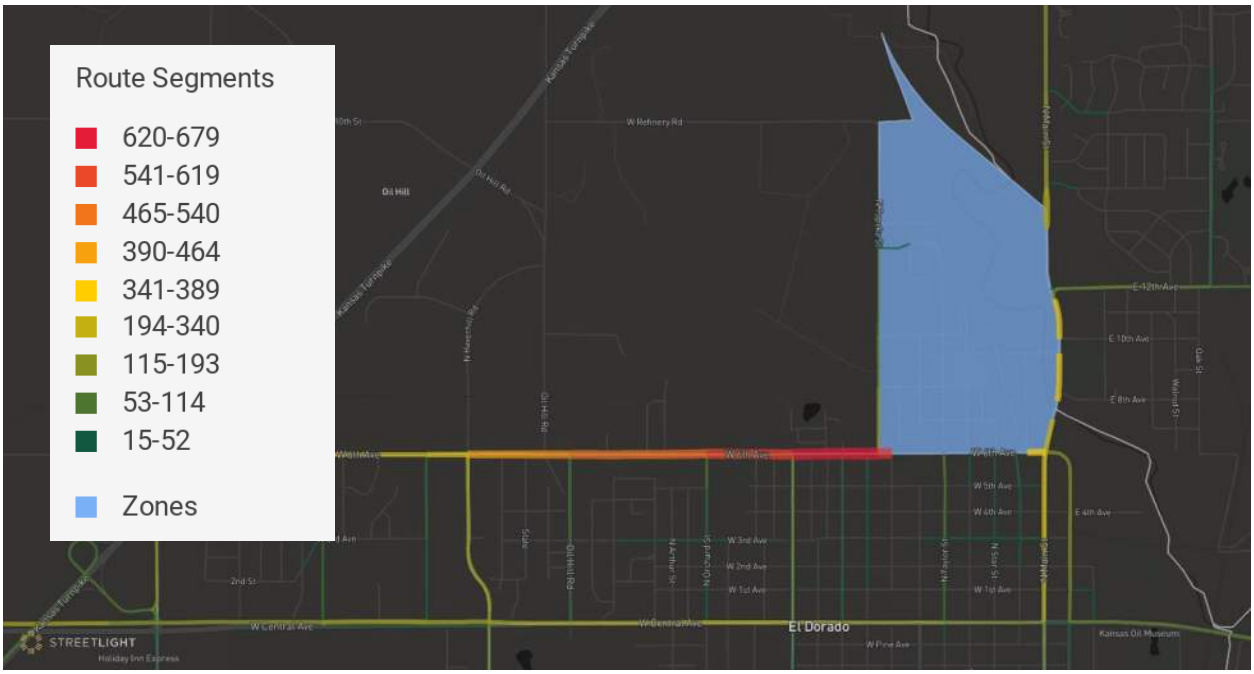


Daily Outbound Traffic from Zone 7 (ADT Levels)

Daily Inbound Traffic to Zone 8 (ADT Levels)

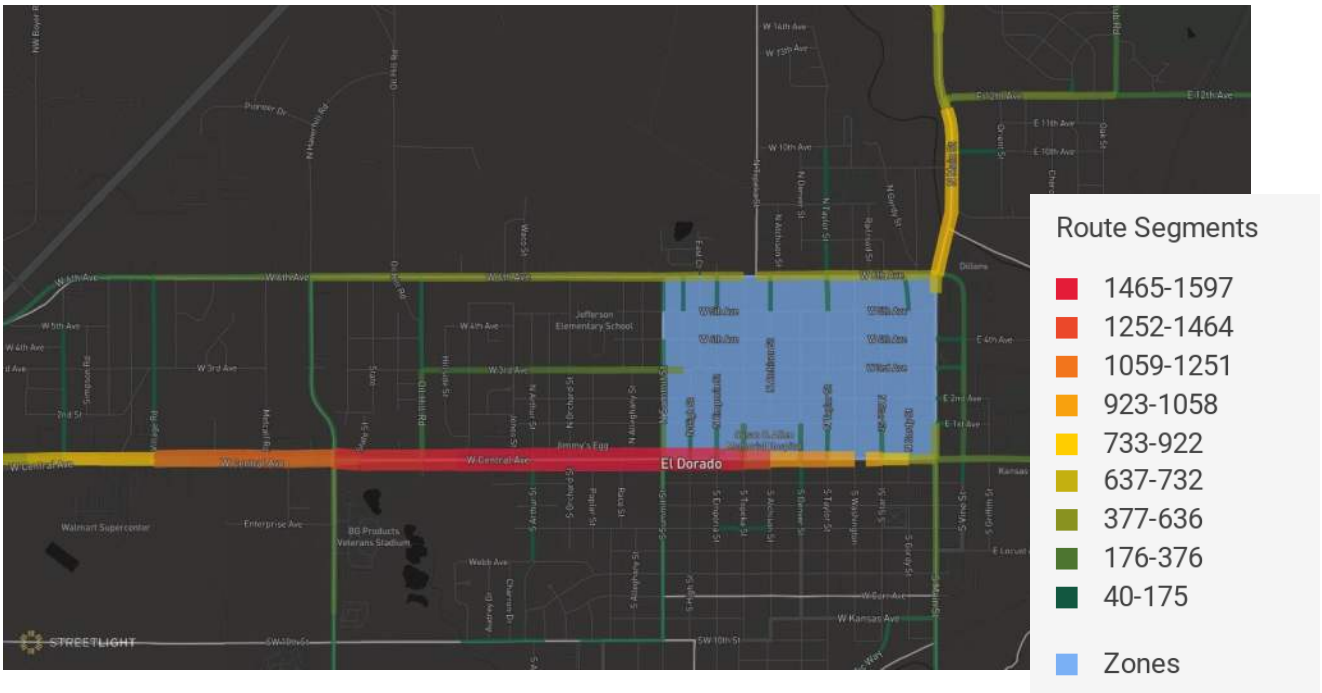


Daily Outbound Traffic from Zone 8 (ADT Levels)

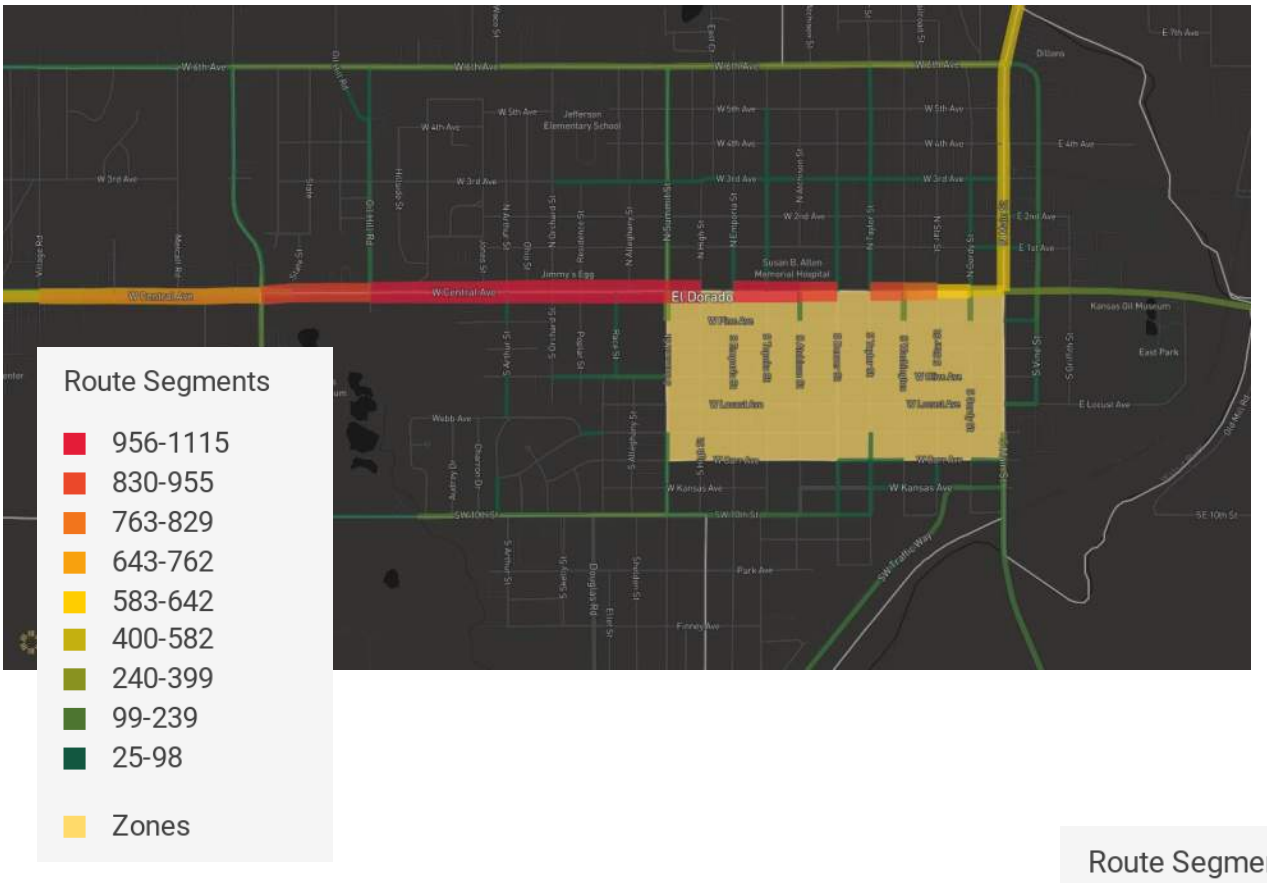


Daily Inbound Traffic to Zone 9 (ADT Levels)

Daily Outbound Traffic from Zone 9 (ADT Levels)



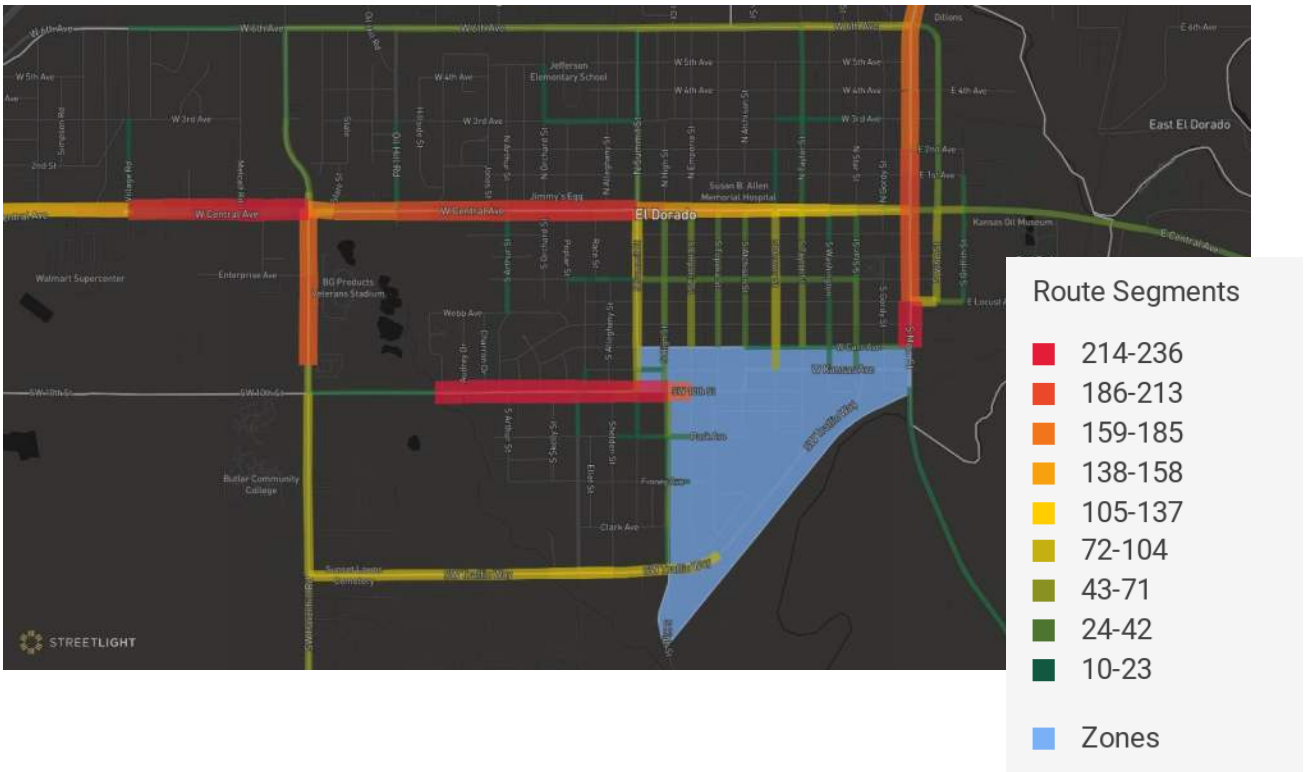
Daily Inbound Traffic to Zone 10 (ADT Levels)



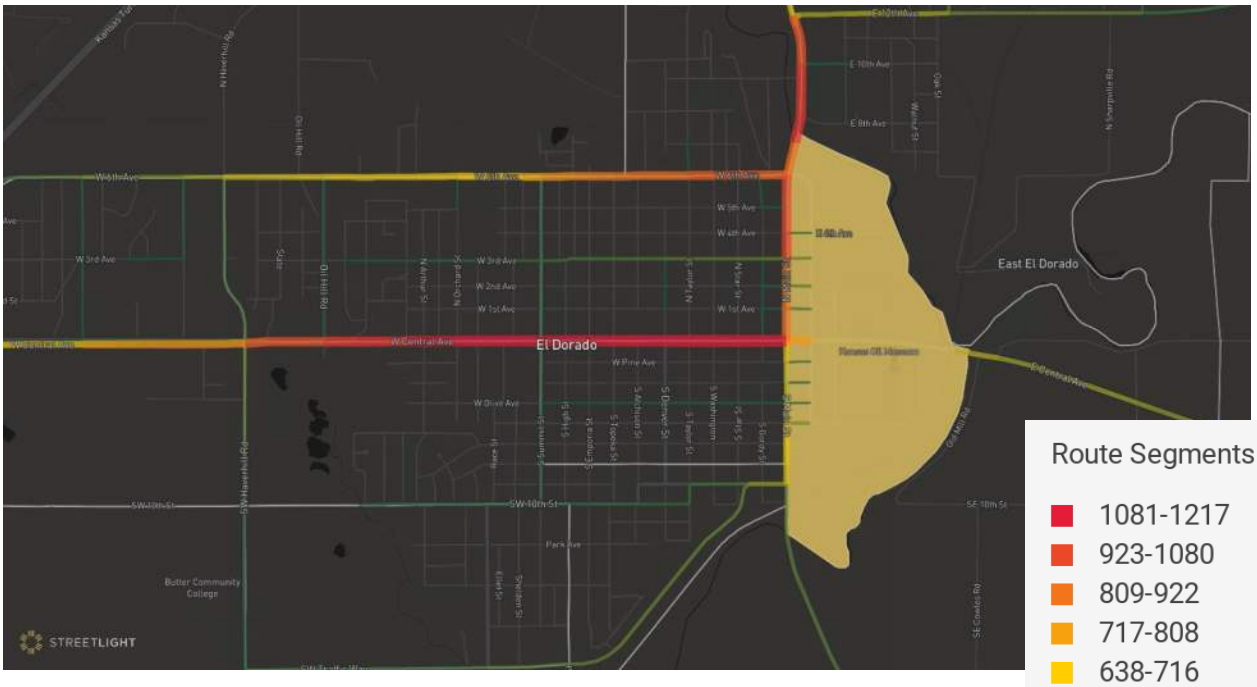
Daily Outbound Traffic from Zone 10 (ADT Levels)

Daily Inbound Traffic to Zone 11 (ADT Levels)

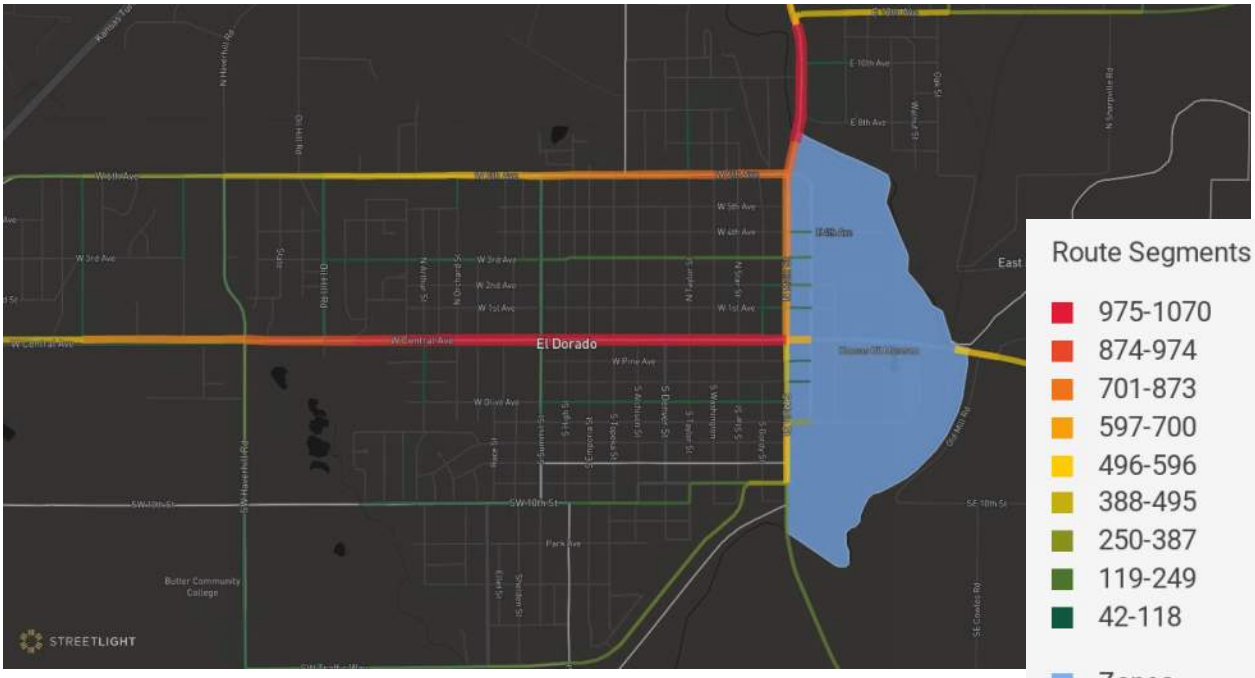
Daily Outbound Traffic from Zone 11 (ADT Levels)



Daily Inbound Traffic to Zone 12 (ADT Levels)



Daily Outbound Traffic from Zone 12 (ADT Levels)



Road Geometry

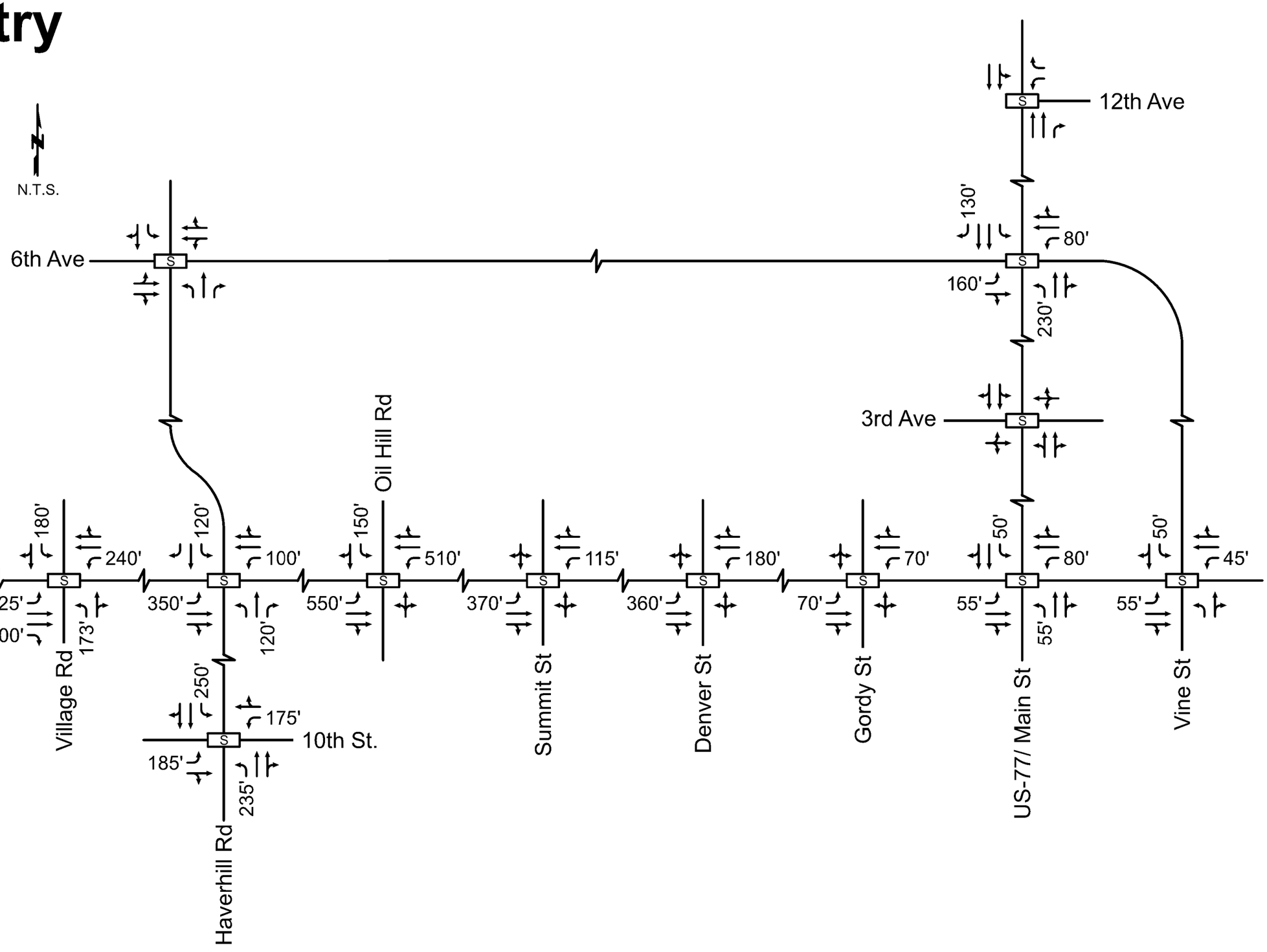
Legend:

XX' Approach Movements, Storage Length

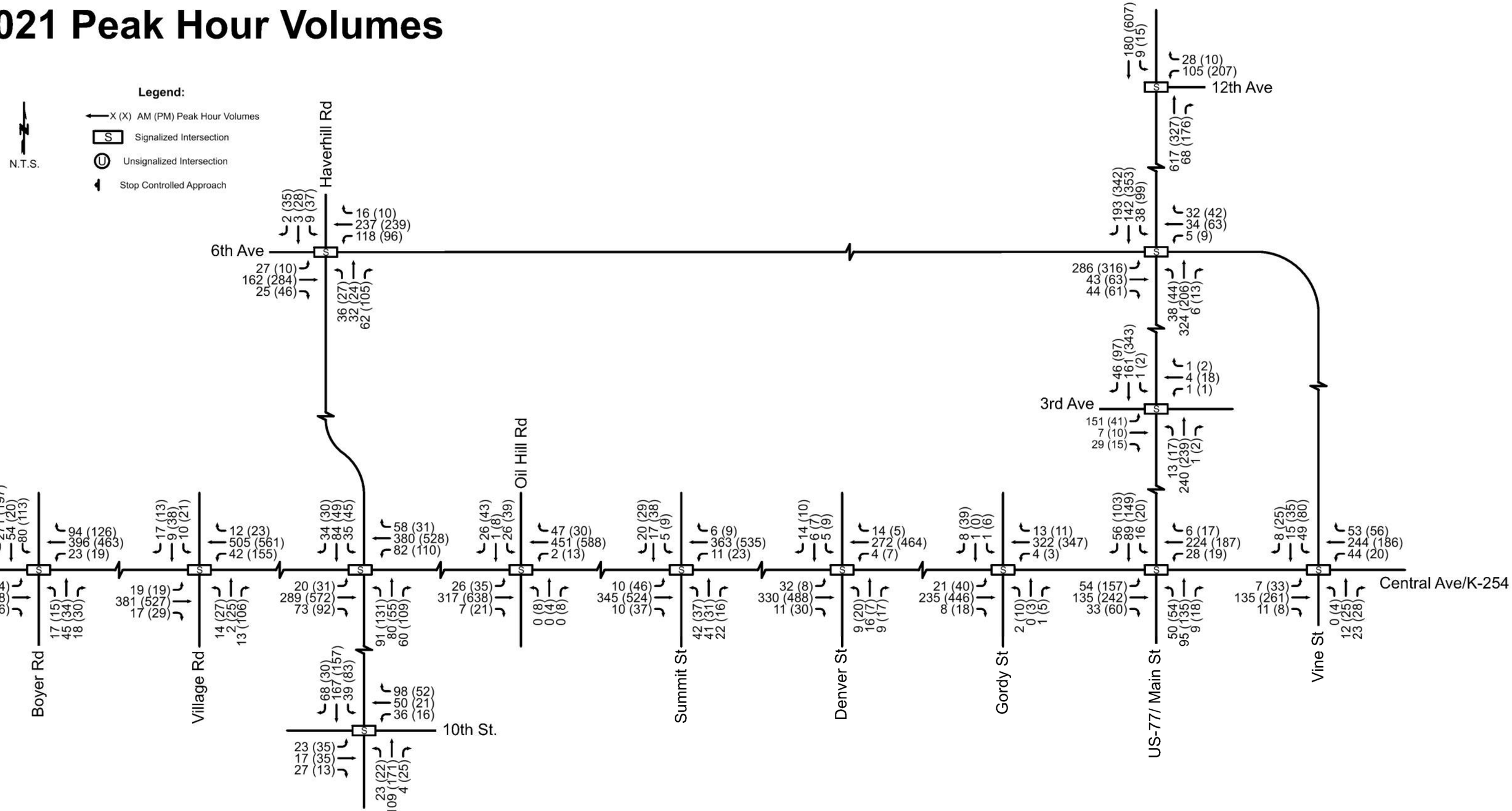
S Signalized Intersection

U Unsignalized Intersection

Stop Controlled Approach



2021 Peak Hour Volumes

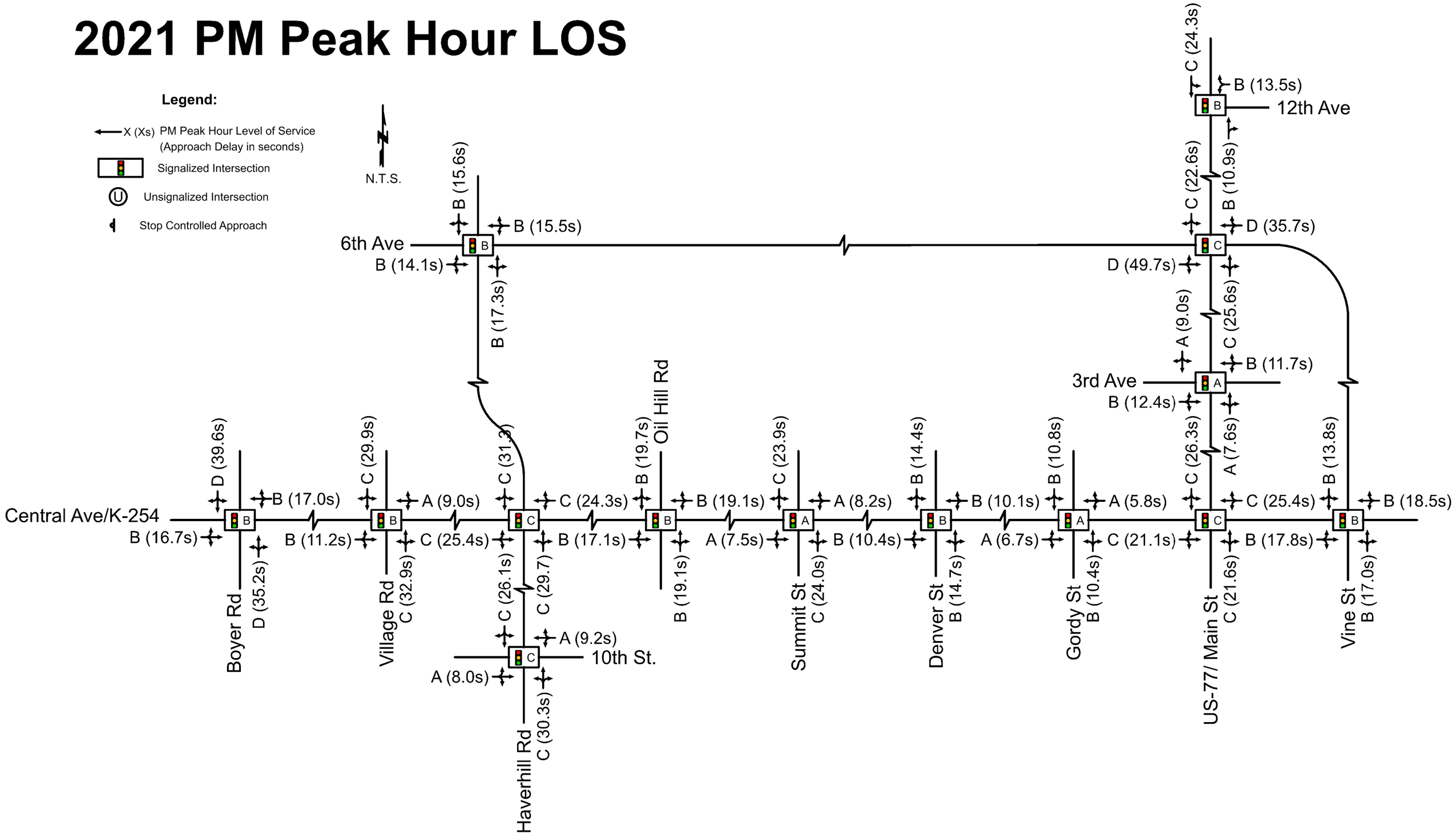


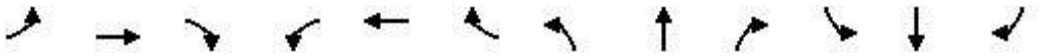
2021 PM Peak Hour LOS

Legend:

- X (Xs) PM Peak Hour Level of Service (Approach Delay in seconds)
- Signalized Intersection
- Unsignalized Intersection
- Stop Controlled Approach

N.T.S.

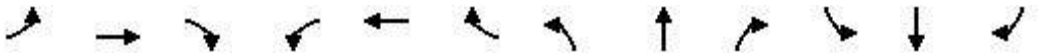




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	572	92	110	528	31	131	55	109	45	49	30
Future Volume (veh/h)	31	572	92	110	528	31	131	55	109	45	49	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	650	105	125	600	35	149	62	124	51	56	34
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	1238	200	154	1503	88	450	439	372	393	368	312
Arrive On Green	0.05	0.40	0.40	0.09	0.44	0.44	0.08	0.23	0.23	0.05	0.20	0.20
Sat Flow, veh/h	1781	3064	494	1781	3413	199	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	35	377	378	125	312	323	149	62	124	51	56	34
Grp Sat Flow(s),veh/h/ln	1781	1777	1781	1781	1777	1835	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.8	15.5	15.5	6.7	11.5	11.5	6.3	2.5	6.3	2.2	2.4	1.7
Cycle Q Clear(g_c), s	1.8	15.5	15.5	6.7	11.5	11.5	6.3	2.5	6.3	2.2	2.4	1.7
Prop In Lane	1.00		0.28	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	90	718	720	154	782	808	450	439	372	393	368	312
V/C Ratio(X)	0.39	0.52	0.53	0.81	0.40	0.40	0.33	0.14	0.33	0.13	0.15	0.11
Avail Cap(c_a), veh/h	277	718	720	277	782	808	576	439	372	587	368	312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	21.7	21.8	43.3	18.3	18.3	26.7	29.2	30.6	28.5	32.1	31.8
Incr Delay (d2), s/veh	1.0	2.7	2.7	3.8	1.5	1.5	0.2	0.7	2.4	0.1	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.6	6.6	3.0	4.7	4.9	2.6	1.2	2.6	0.9	1.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	24.5	24.5	47.1	19.9	19.8	26.9	29.9	33.0	28.6	33.0	32.5
LnGrp LOS	D	C	C	D	B	B	C	C	C	C	C	C
Approach Vol, veh/h		790			760			335			141	
Approach Delay, s/veh		25.4			24.3			29.7			31.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	45.0	13.1	25.0	9.9	48.5	9.5	28.7
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	15.0	39.0	15.0	19.0	15.0	39.0	15.0	19.0
Max Q Clear Time (g_c+I1), s	8.7	17.5	8.3	4.4	3.8	13.5	4.2	8.3
Green Ext Time (p_c), s	0.0	3.6	0.0	0.2	0.0	3.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C



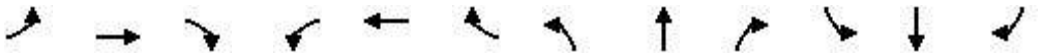
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	638	21	13	588	30	8	4	8	39	8	43
Future Volume (veh/h)	35	638	21	13	588	30	8	4	8	39	8	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	725	24	15	668	34	9	5	9	44	9	49
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	1624	54	38	1512	77	225	132	189	529	78	425
Arrive On Green	0.04	0.46	0.46	0.02	0.44	0.44	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1781	3510	116	1781	3441	175	522	426	609	1400	252	1372
Grp Volume(v), veh/h	40	367	382	15	345	357	23	0	0	44	0	58
Grp Sat Flow(s),veh/h/ln	1781	1777	1849	1781	1777	1839	1557	0	0	1400	0	1623
Q Serve(g_s), s	1.7	11.0	11.0	0.7	10.6	10.6	0.0	0.0	0.0	0.8	0.0	2.0
Cycle Q Clear(g_c), s	1.7	11.0	11.0	0.7	10.6	10.6	0.7	0.0	0.0	1.6	0.0	2.0
Prop In Lane	1.00		0.06	1.00		0.10	0.39		0.39	1.00		0.84
Lane Grp Cap(c), veh/h	79	822	856	38	781	808	546	0	0	529	0	503
V/C Ratio(X)	0.50	0.45	0.45	0.39	0.44	0.44	0.04	0.00	0.00	0.08	0.00	0.12
Avail Cap(c_a), veh/h	227	822	856	227	781	808	546	0	0	529	0	503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.7	14.3	14.3	37.9	15.3	15.3	19.0	0.0	0.0	19.2	0.0	19.4
Incr Delay (d2), s/veh	1.8	1.8	1.7	2.5	1.8	1.8	0.1	0.0	0.0	0.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	4.4	4.5	0.3	4.3	4.4	0.3	0.0	0.0	0.6	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	16.0	16.0	40.4	17.1	17.1	19.1	0.0	0.0	19.5	0.0	19.9
LnGrp LOS	D	B	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		789			717			23			102	
Approach Delay, s/veh		17.1			17.6			19.1			19.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	41.8		30.0	8.5	40.0		30.0				
Change Period (Y+Rc), s	5.0	* 5.5		* 5.7	5.0	* 5.5		* 5.7				
Max Green Setting (Gmax), s	10.0	* 35		* 24	10.0	* 35		* 24				
Max Q Clear Time (g_c+I1), s	2.7	13.0		4.0	3.7	12.6		2.7				
Green Ext Time (p_c), s	0.0	1.5		0.1	0.0	1.4		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		17.5
HCM 6th LOS		B

Notes

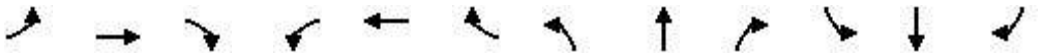
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	261	8	20	186	56	4	25	28	80	35	25
Future Volume (veh/h)	33	261	8	20	186	56	4	25	28	80	35	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	300	9	23	214	64	5	29	32	92	40	29
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	436	1080	32	417	799	233	516	239	264	583	353	256
Arrive On Green	0.04	0.31	0.31	0.03	0.29	0.29	0.01	0.29	0.29	0.06	0.35	0.35
Sat Flow, veh/h	1781	3523	105	1781	2714	791	1781	812	897	1781	1008	731
Grp Volume(v), veh/h	38	151	158	23	138	140	5	0	61	92	0	69
Grp Sat Flow(s),veh/h/ln	1781	1777	1851	1781	1777	1728	1781	0	1709	1781	0	1739
Q Serve(g_s), s	0.9	4.2	4.2	0.6	3.8	4.0	0.1	0.0	1.7	2.2	0.0	1.7
Cycle Q Clear(g_c), s	0.9	4.2	4.2	0.6	3.8	4.0	0.1	0.0	1.7	2.2	0.0	1.7
Prop In Lane	1.00		0.06	1.00		0.46	1.00		0.52	1.00		0.42
Lane Grp Cap(c), veh/h	436	545	568	417	523	509	516	0	503	583	0	609
V/C Ratio(X)	0.09	0.28	0.28	0.06	0.26	0.27	0.01	0.00	0.12	0.16	0.00	0.11
Avail Cap(c_a), veh/h	809	545	568	812	523	509	946	0	503	914	0	609
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	16.9	17.0	15.2	17.4	17.5	15.8	0.0	16.6	13.1	0.0	14.2
Incr Delay (d2), s/veh	0.1	1.3	1.2	0.1	1.2	1.3	0.0	0.0	0.5	0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.8	1.9	0.2	1.7	1.7	0.1	0.0	0.7	0.8	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.9	18.2	18.2	15.2	18.6	18.8	15.8	0.0	17.1	13.2	0.0	14.5
LnGrp LOS	B	B	B	B	B	B	B	A	B	B	A	B
Approach Vol, veh/h		347			301			66			161	
Approach Delay, s/veh		17.8			18.5			17.0			13.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.7	25.8	4.4	28.6	6.5	25.0	8.0	25.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	16.0	19.0	16.0	19.0	16.0	19.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	2.6	6.2	2.1	3.7	2.9	6.0	4.2	3.7
Green Ext Time (p_c), s	0.0	2.2	0.0	0.4	0.0	2.0	0.1	0.3

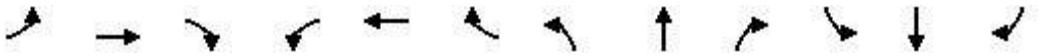
Intersection Summary	
HCM 6th Ctrl Delay	17.2
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	242	60	19	187	17	54	135	18	20	149	103
Future Volume (veh/h)	157	242	60	19	187	17	54	135	18	20	149	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	167	257	64	20	199	18	57	144	19	21	159	110
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	559	1034	253	468	1012	91	489	1084	141	528	633	412
Arrive On Green	0.10	0.37	0.37	0.04	0.31	0.31	0.08	0.34	0.34	0.04	0.31	0.31
Sat Flow, veh/h	1781	2831	692	1781	3298	296	1781	3162	411	1781	2062	1343
Grp Volume(v), veh/h	167	159	162	20	106	111	57	80	83	21	136	133
Grp Sat Flow(s),veh/h/ln	1781	1777	1746	1781	1777	1817	1781	1777	1796	1781	1777	1629
Q Serve(g_s), s	5.8	6.1	6.3	0.7	4.3	4.4	2.0	3.0	3.1	0.8	5.6	6.0
Cycle Q Clear(g_c), s	5.8	6.1	6.3	0.7	4.3	4.4	2.0	3.0	3.1	0.8	5.6	6.0
Prop In Lane	1.00		0.40	1.00		0.16	1.00		0.23	1.00		0.82
Lane Grp Cap(c), veh/h	559	649	638	468	545	558	489	609	616	528	545	500
V/C Ratio(X)	0.30	0.25	0.25	0.04	0.20	0.20	0.12	0.13	0.13	0.04	0.25	0.27
Avail Cap(c_a), veh/h	743	649	638	756	545	558	710	609	616	813	545	500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	21.6	21.7	20.9	25.0	25.0	18.9	22.1	22.1	20.8	25.4	25.6
Incr Delay (d2), s/veh	0.4	0.9	1.0	0.1	0.8	0.8	0.1	0.4	0.5	0.0	1.1	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.7	2.8	0.3	1.9	2.0	0.8	1.3	1.4	0.3	2.5	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	22.5	22.7	21.0	25.8	25.8	19.0	22.5	22.6	20.9	26.5	26.9
LnGrp LOS	B	C	C	C	C	C	B	C	C	C	C	C
Approach Vol, veh/h		488			237			220			290	
Approach Delay, s/veh		21.1			25.4			21.6			26.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	40.7	12.9	35.0	14.9	35.0	9.3	38.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.7	8.3	4.0	8.0	7.8	6.4	2.8	5.1
Green Ext Time (p_c), s	0.0	3.5	0.1	2.9	0.5	2.3	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C



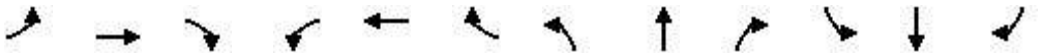
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	446	18	3	347	11	10	3	5	6	0	39
Future Volume (veh/h)	40	446	18	3	347	11	10	3	5	6	0	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	44	490	20	3	381	12	11	3	5	7	0	43
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	602	1580	64	542	1597	50	319	95	86	144	28	292
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.21	0.21	0.21	0.21	0.00	0.21
Sat Flow, veh/h	991	3480	142	890	3517	111	689	447	406	93	130	1370
Grp Volume(v), veh/h	44	250	260	3	192	201	19	0	0	50	0	0
Grp Sat Flow(s),veh/h/ln	991	1777	1845	890	1777	1850	1541	0	0	1593	0	0
Q Serve(g_s), s	0.9	3.0	3.0	0.1	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.1	3.0	3.0	3.0	2.2	2.2	0.3	0.0	0.0	0.8	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.06	0.58		0.26	0.14		0.86
Lane Grp Cap(c), veh/h	602	807	838	542	807	840	500	0	0	464	0	0
V/C Ratio(X)	0.07	0.31	0.31	0.01	0.24	0.24	0.04	0.00	0.00	0.11	0.00	0.00
Avail Cap(c_a), veh/h	602	807	838	946	1614	1681	1530	0	0	1546	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.5	5.7	5.7	6.7	5.5	5.5	10.3	0.0	0.0	10.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	1.0	1.0	0.0	0.3	0.3	0.1	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.9	0.9	0.0	0.6	0.6	0.1	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.7	6.7	6.7	6.7	5.8	5.8	10.4	0.0	0.0	10.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		554			396			19			50	
Approach Delay, s/veh		6.7			5.8			10.4			10.8	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		21.0		12.0		21.0		12.0				
Change Period (Y+Rc), s		6.0		5.0		* 6		5.0				
Max Green Setting (Gmax), s		14.0		30.0		* 30		30.0				
Max Q Clear Time (g_c+I1), s		5.1		2.8		5.0		2.3				
Green Ext Time (p_c), s		3.6		0.4		4.6		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			6.6									
HCM 6th LOS			A									

Notes

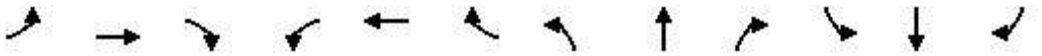
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	488	30	7	464	5	20	7	17	9	7	10
Future Volume (veh/h)	8	488	30	7	464	5	20	7	17	9	7	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	9	574	35	8	546	6	24	8	20	11	8	12
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	463	1673	102	435	1770	19	283	107	189	224	168	196
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	856	3403	207	812	3601	40	617	337	597	451	530	619
Grp Volume(v), veh/h	9	299	310	8	269	283	52	0	0	31	0	0
Grp Sat Flow(s),veh/h/ln	856	1777	1833	812	1777	1863	1551	0	0	1600	0	0
Q Serve(g_s), s	0.4	6.2	6.2	0.4	5.4	5.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.8	6.2	6.2	6.6	5.4	5.5	1.3	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.02	0.46		0.38	0.35		0.39
Lane Grp Cap(c), veh/h	463	874	901	435	874	916	579	0	0	588	0	0
V/C Ratio(X)	0.02	0.34	0.34	0.02	0.31	0.31	0.09	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	463	874	901	435	874	916	579	0	0	588	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.9	9.3	9.3	11.3	9.1	9.1	14.4	0.0	0.0	14.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.1	1.0	0.1	0.9	0.9	0.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.3	2.3	0.1	2.0	2.1	0.5	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	10.4	10.4	11.4	10.1	10.0	14.7	0.0	0.0	14.4	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		618			560			52			31	
Approach Delay, s/veh		10.4			10.1			14.7			14.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		25.0		35.0		25.0				
Change Period (Y+Rc), s		5.5		6.0		5.5		6.0				
Max Green Setting (Gmax), s		29.5		19.0		29.5		19.0				
Max Q Clear Time (g_c+I1), s		8.2		2.7		8.6		3.3				
Green Ext Time (p_c), s		6.9		0.1		6.1		0.2				

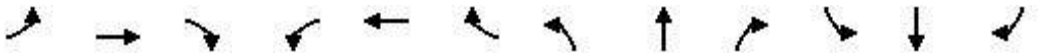
Intersection Summary												
HCM 6th Ctrl Delay			10.5									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	524	37	23	535	9	37	31	16	9	38	29
Future Volume (veh/h)	46	524	37	23	535	9	37	31	16	9	38	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	609	43	27	622	10	43	36	19	10	44	34
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	579	1856	131	549	1888	30	156	76	33	85	97	68
Arrive On Green	0.06	0.55	0.55	0.04	0.53	0.53	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1781	3367	237	1781	3579	58	603	742	323	114	945	666
Grp Volume(v), veh/h	53	321	331	27	309	323	98	0	0	88	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1828	1781	1777	1860	1668	0	0	1724	0	0
Q Serve(g_s), s	0.7	5.4	5.5	0.4	5.5	5.5	0.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	5.4	5.5	0.4	5.5	5.5	2.8	0.0	0.0	2.6	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.03	0.44		0.19	0.11		0.39
Lane Grp Cap(c), veh/h	579	979	1007	549	937	981	266	0	0	250	0	0
V/C Ratio(X)	0.09	0.33	0.33	0.05	0.33	0.33	0.37	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	1281	979	1007	1132	937	981	639	0	0	658	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.1	6.8	6.8	5.5	7.4	7.4	23.4	0.0	0.0	23.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.9	0.0	0.9	0.9	0.6	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.7	1.8	0.1	1.8	1.9	1.2	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.1	7.7	7.6	5.5	8.4	8.3	24.0	0.0	0.0	23.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	A	C	A	A
Approach Vol, veh/h		705			659			98			88	
Approach Delay, s/veh		7.5			8.2			24.0			23.9	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	36.3		11.6	8.3	35.0		11.6				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	20.0	29.0		19.0	25.0	29.0		19.0				
Max Q Clear Time (g_c+I1), s	2.4	7.5		4.6	2.7	7.5		4.8				
Green Ext Time (p_c), s	0.0	3.1		0.3	0.0	3.0		0.3				

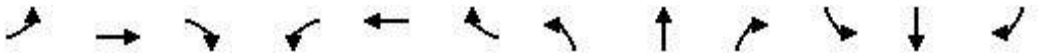
Intersection Summary			
HCM 6th Ctrl Delay		9.8	
HCM 6th LOS		A	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	527	29	155	561	23	27	25	106	21	38	13
Future Volume (veh/h)	19	527	29	155	561	23	27	25	106	21	38	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	567	31	167	603	25	29	27	114	23	41	14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	528	1812	875	591	1969	82	303	42	178	222	171	58
Arrive On Green	0.03	0.51	0.51	0.09	0.57	0.57	0.04	0.13	0.13	0.04	0.13	0.13
Sat Flow, veh/h	1781	3554	1585	1781	3477	144	1781	313	1320	1781	1333	455
Grp Volume(v), veh/h	20	567	31	167	308	320	29	0	141	23	0	55
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1844	1781	0	1633	1781	0	1788
Q Serve(g_s), s	0.4	7.2	0.7	3.0	7.0	7.1	1.1	0.0	6.3	0.8	0.0	2.1
Cycle Q Clear(g_c), s	0.4	7.2	0.7	3.0	7.0	7.1	1.1	0.0	6.3	0.8	0.0	2.1
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.81	1.00		0.25
Lane Grp Cap(c), veh/h	528	1812	875	591	1006	1044	303	0	220	222	0	229
V/C Ratio(X)	0.04	0.31	0.04	0.28	0.31	0.31	0.10	0.00	0.64	0.10	0.00	0.24
Avail Cap(c_a), veh/h	1185	1812	875	1148	1006	1044	711	0	537	642	0	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.3	11.1	7.9	6.7	8.8	8.8	27.2	0.0	31.8	27.7	0.0	30.4
Incr Delay (d2), s/veh	0.0	0.5	0.1	0.2	0.8	0.8	0.1	0.0	2.3	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.5	0.2	0.9	2.5	2.5	0.4	0.0	2.6	0.4	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.3	11.5	8.0	6.9	9.6	9.6	27.3	0.0	34.1	27.9	0.0	30.8
LnGrp LOS	A	B	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		618			795			170			78	
Approach Delay, s/veh		11.2			9.0			32.9			29.9	
Approach LOS		B			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	45.0	7.2	14.4	6.4	49.4	6.7	14.9
Change Period (Y+Rc), s	4.0	5.5	4.0	4.5	4.0	5.5	4.0	4.5
Max Green Setting (Gmax), s	31.0	39.5	21.0	25.5	31.0	39.5	21.0	25.5
Max Q Clear Time (g_c+I1), s	5.0	9.2	3.1	4.1	2.4	9.1	2.8	8.3
Green Ext Time (p_c), s	0.3	3.2	0.0	0.2	0.0	3.0	0.0	0.6

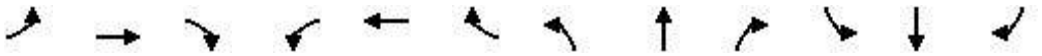
Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	284	46	96	239	10	27	24	105	37	28	35
Future Volume (veh/h)	10	284	46	96	239	10	27	24	105	37	28	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	309	50	104	260	11	29	26	114	40	30	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	1135	178	319	813	36	539	532	451	546	221	280
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.28	0.28	0.05	0.29	0.29
Sat Flow, veh/h	32	2968	466	593	2128	94	1781	1870	1585	1781	750	950
Grp Volume(v), veh/h	196	0	174	178	0	197	29	26	114	40	0	68
Grp Sat Flow(s),veh/h/ln	1848	0	1618	1129	0	1685	1781	1870	1585	1781	0	1699
Q Serve(g_s), s	0.0	0.0	4.6	4.5	0.0	5.0	0.7	0.6	3.4	0.9	0.0	1.8
Cycle Q Clear(g_c), s	4.5	0.0	4.6	9.1	0.0	5.0	0.7	0.6	3.4	0.9	0.0	1.8
Prop In Lane	0.06		0.29	0.58		0.06	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	768	0	619	525	0	644	539	532	451	546	0	501
V/C Ratio(X)	0.26	0.00	0.28	0.34	0.00	0.31	0.05	0.05	0.25	0.07	0.00	0.14
Avail Cap(c_a), veh/h	768	0	619	525	0	644	775	532	451	764	0	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.1	0.0	13.1	14.8	0.0	13.3	14.3	15.9	16.9	14.0	0.0	15.9
Incr Delay (d2), s/veh	0.8	0.0	1.1	1.8	0.0	1.2	0.0	0.2	1.3	0.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	1.6	1.9	0.0	1.9	0.2	0.3	1.3	0.3	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	0.0	14.3	16.5	0.0	14.5	14.4	16.1	18.3	14.0	0.0	16.5
LnGrp LOS	B	A	B	B	A	B	B	B	B	B	A	B
Approach Vol, veh/h		370			375			169			108	
Approach Delay, s/veh		14.1			15.5			17.3			15.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		30.0	6.8	24.6		30.0	7.5	24.0				
Change Period (Y+Rc), s		6.5	4.5	6.5		6.5	4.5	6.5				
Max Green Setting (Gmax), s		23.5	10.5	17.5		23.5	10.5	17.5				
Max Q Clear Time (g_c+I1), s		6.6	2.7	3.8		11.1	2.9	5.4				
Green Ext Time (p_c), s		1.9	0.0	0.2		1.8	0.0	0.2				

Intersection Summary												
HCM 6th Ctrl Delay			15.3									
HCM 6th LOS			B									



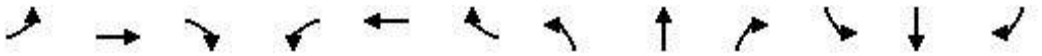
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	35	13	16	21	52	22	171	25	83	157	30
Future Volume (veh/h)	35	35	13	16	21	52	22	171	25	83	157	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	41	15	19	24	60	26	199	29	97	183	35
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	805	676	247	820	235	588	278	359	52	296	460	86
Arrive On Green	0.05	0.52	0.52	0.03	0.50	0.50	0.03	0.12	0.12	0.07	0.15	0.15
Sat Flow, veh/h	1781	1306	478	1781	474	1184	1781	3119	448	1781	2986	560
Grp Volume(v), veh/h	41	0	56	19	0	84	26	112	116	97	107	111
Grp Sat Flow(s),veh/h/ln	1781	0	1784	1781	0	1657	1781	1777	1790	1781	1777	1770
Q Serve(g_s), s	0.7	0.0	1.1	0.4	0.0	1.9	0.9	4.1	4.3	3.2	3.8	3.9
Cycle Q Clear(g_c), s	0.7	0.0	1.1	0.4	0.0	1.9	0.9	4.1	4.3	3.2	3.8	3.9
Prop In Lane	1.00		0.27	1.00		0.71	1.00		0.25	1.00		0.32
Lane Grp Cap(c), veh/h	805	0	923	820	0	823	278	205	206	296	274	273
V/C Ratio(X)	0.05	0.00	0.06	0.02	0.00	0.10	0.09	0.55	0.56	0.33	0.39	0.41
Avail Cap(c_a), veh/h	1267	0	923	1319	0	823	764	622	626	712	622	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	0.0	8.3	8.0	0.0	9.3	25.5	29.0	29.1	23.6	26.4	26.5
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.0	0.0	0.2	0.1	1.7	1.8	0.2	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.4	0.1	0.0	0.7	0.3	1.7	1.8	1.2	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.4	0.0	8.5	8.0	0.0	9.5	25.6	30.7	30.9	23.8	27.1	27.2
LnGrp LOS	A	A	A	A	A	A	C	C	C	C	C	C
Approach Vol, veh/h		97			103			254			315	
Approach Delay, s/veh		8.0			9.2			30.3			26.1	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	41.4	6.1	16.4	7.0	40.0	8.8	13.7
Change Period (Y+Rc), s	3.7	* 5.5	3.7	* 5.7	3.7	* 5.5	3.7	* 5.7
Max Green Setting (Gmax), s	21.3	* 35	21.3	* 24	21.3	* 35	21.3	* 24
Max Q Clear Time (g_c+I1), s	2.4	3.1	2.9	5.9	2.7	3.9	5.2	6.3
Green Ext Time (p_c), s	0.0	0.2	0.0	0.8	0.0	0.4	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	316	63	61	9	63	42	44	206	13	99	353	342
Future Volume (veh/h)	316	63	61	9	63	42	44	206	13	99	353	342
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	545	109	105	16	109	72	76	355	22	171	609	590
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	555	277	267	262	220	186	268	952	59	441	1103	843
Arrive On Green	0.22	0.32	0.32	0.02	0.12	0.12	0.06	0.28	0.28	0.09	0.31	0.31
Sat Flow, veh/h	1781	875	843	1781	1870	1585	1781	3400	210	1781	3554	1585
Grp Volume(v), veh/h	545	0	214	16	109	72	76	185	192	171	609	590
Grp Sat Flow(s),veh/h/ln	1781	0	1719	1781	1870	1585	1781	1777	1833	1781	1777	1585
Q Serve(g_s), s	18.8	0.0	8.3	0.7	4.6	3.6	2.5	7.1	7.2	5.7	12.1	23.6
Cycle Q Clear(g_c), s	18.8	0.0	8.3	0.7	4.6	3.6	2.5	7.1	7.2	5.7	12.1	23.6
Prop In Lane	1.00		0.49	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	555	0	544	262	220	186	268	498	513	441	1103	843
V/C Ratio(X)	0.98	0.00	0.39	0.06	0.50	0.39	0.28	0.37	0.37	0.39	0.55	0.70
Avail Cap(c_a), veh/h	555	0	544	616	524	444	557	498	513	571	1103	843
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	22.7	31.7	35.1	34.7	20.0	24.6	24.6	19.1	24.4	14.8
Incr Delay (d2), s/veh	33.6	0.0	0.3	0.0	1.3	1.0	0.2	2.1	2.1	0.2	2.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.0	3.3	0.3	2.2	1.4	1.0	3.2	3.3	2.2	5.2	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.2	0.0	23.0	31.8	36.4	35.6	20.3	26.7	26.7	19.3	26.4	19.7
LnGrp LOS	E	A	C	C	D	D	C	C	C	B	C	B
Approach Vol, veh/h		759			197			453			1370	
Approach Delay, s/veh		49.7			35.7			25.6			22.6	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	33.1	11.2	32.6	25.0	16.2	13.8	30.0
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2
Max Green Setting (Gmax), s	* 19	* 24	* 19	* 24	* 19	* 24	* 14	* 24
Max Q Clear Time (g_c+I1), s	2.7	10.3	4.5	25.6	20.8	6.6	7.7	9.2
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.0	0.5	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

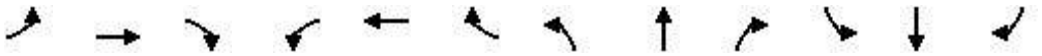
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	207	10	327	176	15	607
Future Volume (veh/h)	207	10	327	176	15	607
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	406	20	641	0	29	1190
Peak Hour Factor	0.51	0.51	0.51	0.51	0.51	0.51
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	713	634	1421		98	1361
Arrive On Green	0.40	0.40	0.40	0.00	0.40	0.40
Sat Flow, veh/h	1781	1585	3647	1585	36	3487
Grp Volume(v), veh/h	406	20	641	0	648	571
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1821	1617
Q Serve(g_s), s	8.0	0.3	5.9	0.0	5.0	14.8
Cycle Q Clear(g_c), s	8.0	0.3	5.9	0.0	14.7	14.8
Prop In Lane	1.00	1.00		1.00	0.04	
Lane Grp Cap(c), veh/h	713	634	1421		812	647
V/C Ratio(X)	0.57	0.03	0.45		0.80	0.88
Avail Cap(c_a), veh/h	713	634	1421		812	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	10.5	8.2	9.9	0.0	12.4	12.5
Incr Delay (d2), s/veh	3.3	0.1	1.0	0.0	8.0	16.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.1	1.9	0.0	6.1	6.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.8	8.3	10.9	0.0	20.5	28.6
LnGrp LOS	B	A	B		C	C
Approach Vol, veh/h	426		641			1219
Approach Delay, s/veh	13.5		10.9			24.3
Approach LOS	B		B			C

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		22.5			22.5	22.5
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		18.0			18.0	18.0
Max Q Clear Time (g_c+I1), s		7.9			16.8	10.0
Green Ext Time (p_c), s		3.0			0.9	0.9

Intersection Summary		
HCM 6th Ctrl Delay	18.5	
HCM 6th LOS	B	

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



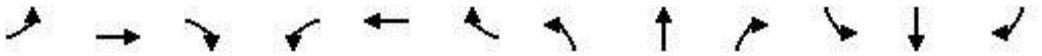
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	10	15	1	18	2	17	239	2	2	343	97
Future Volume (veh/h)	41	10	15	1	18	2	17	239	2	2	343	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	72	18	26	2	32	4	30	419	4	4	602	170
Peak Hour Factor	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	368	97	97	91	462	55	138	1526	14	83	1252	351
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	830	341	338	22	1613	192	101	3265	31	3	2679	751
Grp Volume(v), veh/h	116	0	0	38	0	0	231	0	222	421	0	355
Grp Sat Flow(s),veh/h/ln	1508	0	0	1827	0	0	1700	0	1697	1867	0	1567
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	7.0
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.7	0.0	0.0	3.4	0.0	3.6	6.9	0.0	7.0
Prop In Lane	0.62		0.22	0.05		0.11	0.13		0.02	0.01		0.48
Lane Grp Cap(c), veh/h	562	0	0	608	0	0	886	0	793	954	0	732
V/C Ratio(X)	0.21	0.00	0.00	0.06	0.00	0.00	0.26	0.00	0.28	0.44	0.00	0.48
Avail Cap(c_a), veh/h	1596	0	0	1907	0	0	1715	0	1710	1956	0	1579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.2	0.0	0.0	11.6	0.0	0.0	7.2	0.0	7.3	8.2	0.0	8.2
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.4	0.7	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.2	0.0	0.0	1.0	0.0	1.0	2.3	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	0.0	11.7	0.0	0.0	7.6	0.0	7.7	8.9	0.0	9.2
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		116			38			453			776	
Approach Delay, s/veh		12.4			11.7			7.6			9.0	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	18.8	25.9	18.8	25.9
Change Period (Y+Rc), s	6.0	5.0	* 6	5.0
Max Green Setting (Gmax), s	44.0	45.0	* 45	45.0
Max Q Clear Time (g_c+I1), s	4.4	9.0	2.7	5.6
Green Ext Time (p_c), s	0.7	11.9	0.3	6.0

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	498	16	19	463	126	15	34	30	113	20	197
Future Volume (veh/h)	194	498	16	19	463	126	15	34	30	113	20	197
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	211	541	0	21	503	0	16	37	0	123	22	0
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	2257		80	1686		108	221		268	35	
Arrive On Green	0.21	0.64	0.00	0.04	0.47	0.00	0.16	0.16	0.00	0.16	0.16	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	376	1409	1585	1261	225	1585
Grp Volume(v), veh/h	211	541	0	21	503	0	53	0	0	145	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1785	0	1585	1486	0	1585
Q Serve(g_s), s	10.1	6.2	0.0	1.1	8.2	0.0	0.0	0.0	0.0	6.0	0.0	0.0
Cycle Q Clear(g_c), s	10.1	6.2	0.0	1.1	8.2	0.0	2.3	0.0	0.0	8.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.30		1.00	0.85		1.00
Lane Grp Cap(c), veh/h	375	2257		80	1686		330	0		303	0	
V/C Ratio(X)	0.56	0.24		0.26	0.30		0.16	0.00		0.48	0.00	
Avail Cap(c_a), veh/h	375	2257		366	1686		599	0		530	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.6	7.5	0.0	43.9	15.3	0.0	34.7	0.0	0.0	37.1	0.0	0.0
Incr Delay (d2), s/veh	6.0	0.3	0.0	2.5	0.5	0.0	0.5	0.0	0.0	2.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.2	0.0	0.5	3.3	0.0	1.1	0.0	0.0	3.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.6	7.7	0.0	46.3	15.7	0.0	35.2	0.0	0.0	39.6	0.0	0.0
LnGrp LOS	D	A		D	B		D	A		D	A	
Approach Vol, veh/h		752			524			53			145	
Approach Delay, s/veh		16.7			17.0			35.2			39.6	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	65.3		19.9	25.0	50.1		19.9				
Change Period (Y+Rc), s	5.5	* 5		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	19.5	* 32		30.0	20.0	30.0		30.0				
Max Q Clear Time (g_c+I1), s	3.1	8.2		10.4	12.1	10.2		4.3				
Green Ext Time (p_c), s	0.0	6.7		1.3	0.6	5.7		0.4				

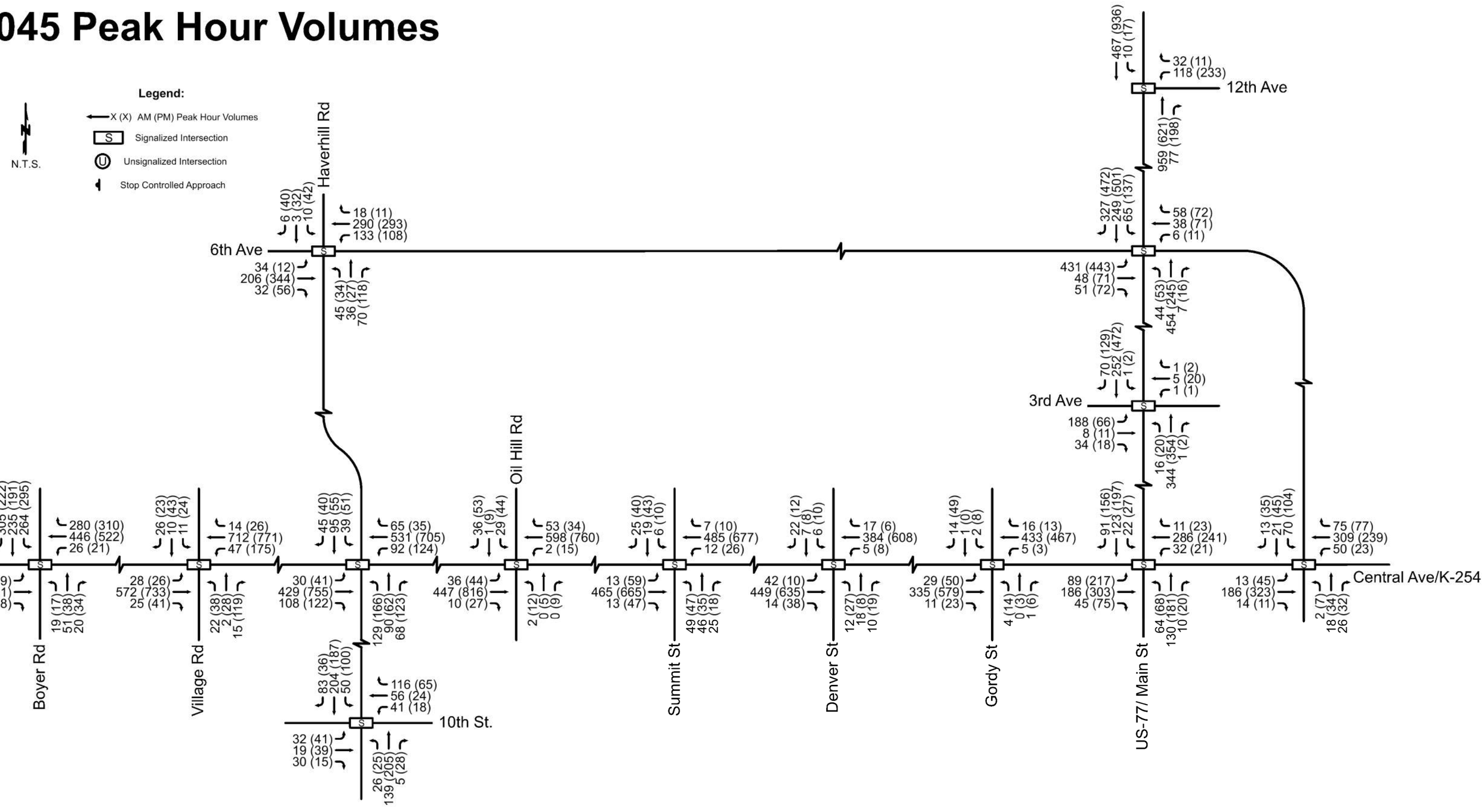
Intersection Summary		
HCM 6th Ctrl Delay		19.7
HCM 6th LOS		B

Notes

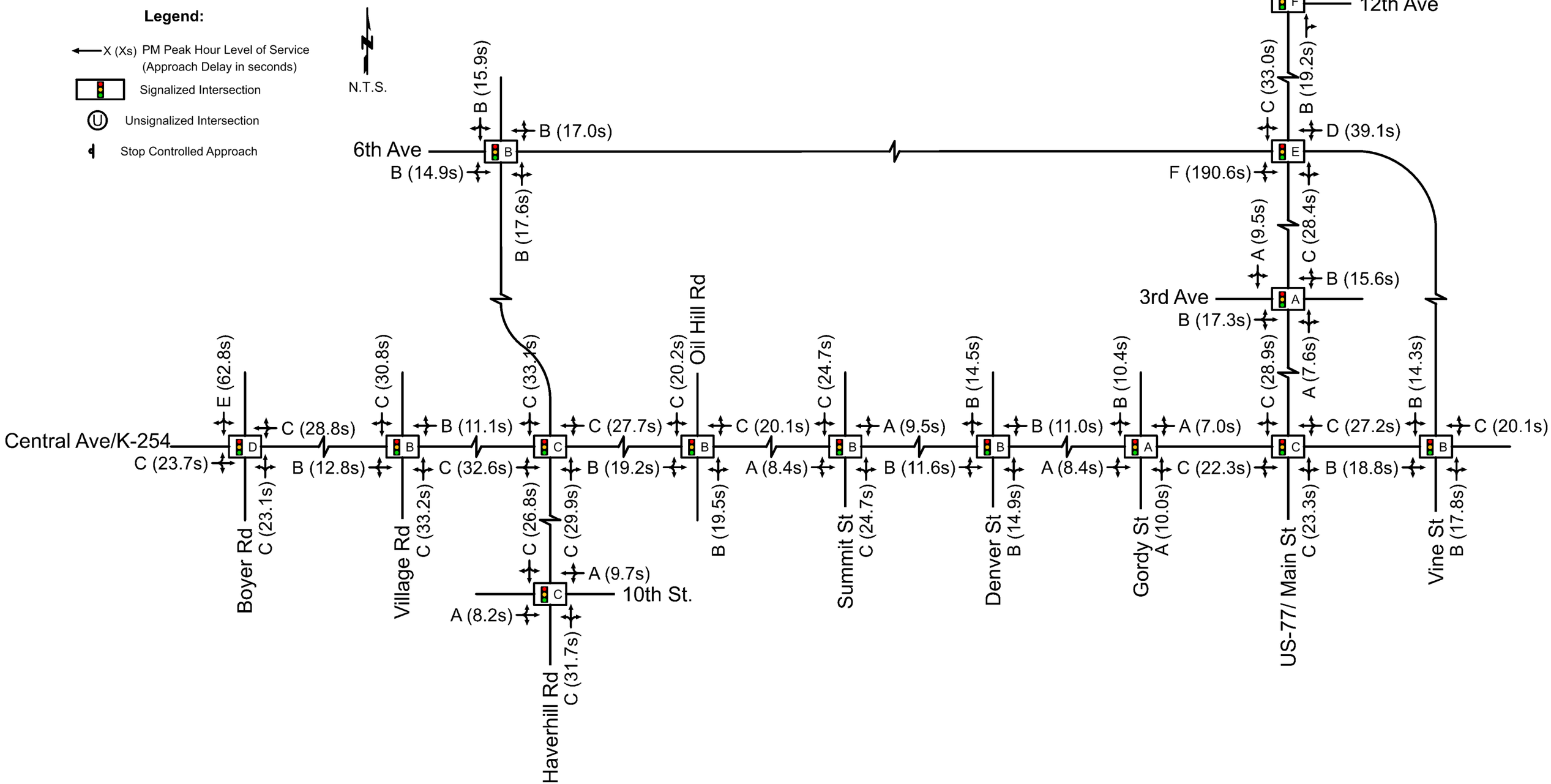
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

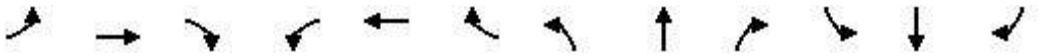
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

2045 Peak Hour Volumes



2045 PM Peak Hour LOS

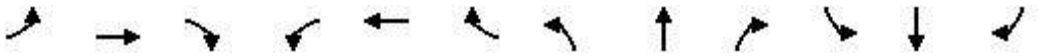




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	755	122	124	705	35	166	62	123	51	55	40
Future Volume (veh/h)	41	755	122	124	705	35	166	62	123	51	55	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	47	858	139	141	801	40	189	70	140	58	62	45
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	1198	194	171	1477	74	463	456	387	381	356	302
Arrive On Green	0.06	0.39	0.39	0.10	0.43	0.43	0.10	0.24	0.24	0.05	0.19	0.19
Sat Flow, veh/h	1781	3062	496	1781	3444	172	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	47	498	499	141	413	428	189	70	140	58	62	45
Grp Sat Flow(s),veh/h/ln	1781	1777	1781	1781	1777	1839	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.5	23.6	23.6	7.7	17.3	17.3	8.1	2.9	7.3	2.6	2.8	2.4
Cycle Q Clear(g_c), s	2.5	23.6	23.6	7.7	17.3	17.3	8.1	2.9	7.3	2.6	2.8	2.4
Prop In Lane	1.00		0.28	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	104	695	697	171	762	789	463	456	387	381	356	302
V/C Ratio(X)	0.45	0.72	0.72	0.82	0.54	0.54	0.41	0.15	0.36	0.15	0.17	0.15
Avail Cap(c_a), veh/h	268	695	697	268	762	789	550	456	387	564	356	302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.4	25.7	25.7	44.2	21.2	21.2	26.5	29.6	31.3	29.9	33.8	33.6
Incr Delay (d2), s/veh	1.1	6.2	6.2	5.9	2.8	2.7	0.2	0.7	2.6	0.1	1.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	10.6	10.6	3.6	7.3	7.5	3.3	1.4	3.0	1.1	1.3	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	31.9	31.9	50.1	24.0	23.9	26.7	30.3	33.9	30.0	34.8	34.7
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		1044			982			399			165	
Approach Delay, s/veh		32.6			27.7			29.9			33.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	45.0	15.1	25.0	10.8	48.8	9.8	30.3
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	15.0	39.0	15.0	19.0	15.0	39.0	15.0	19.0
Max Q Clear Time (g_c+I1), s	9.7	25.6	10.1	4.8	4.5	19.3	4.6	9.3
Green Ext Time (p_c), s	0.0	4.2	0.0	0.2	0.0	3.9	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	30.3
HCM 6th LOS	C



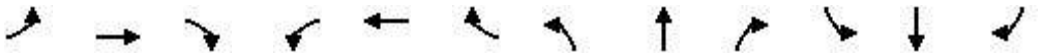
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	816	27	15	760	34	12	5	9	44	9	53
Future Volume (veh/h)	44	816	27	15	760	34	12	5	9	44	9	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	927	31	17	864	39	14	6	10	50	10	60
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	1627	54	42	1512	68	260	117	155	533	71	427
Arrive On Green	0.05	0.46	0.46	0.02	0.44	0.44	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1781	3509	117	1781	3463	156	628	380	504	1397	231	1389
Grp Volume(v), veh/h	50	469	489	17	443	460	30	0	0	50	0	70
Grp Sat Flow(s),veh/h/ln	1781	1777	1849	1781	1777	1842	1511	0	0	1397	0	1620
Q Serve(g_s), s	2.2	15.2	15.2	0.7	14.8	14.8	0.0	0.0	0.0	0.0	0.0	2.5
Cycle Q Clear(g_c), s	2.2	15.2	15.2	0.7	14.8	14.8	2.5	0.0	0.0	1.6	0.0	2.5
Prop In Lane	1.00		0.06	1.00		0.08	0.47		0.33	1.00		0.86
Lane Grp Cap(c), veh/h	90	824	857	42	776	805	532	0	0	533	0	498
V/C Ratio(X)	0.55	0.57	0.57	0.40	0.57	0.57	0.06	0.00	0.00	0.09	0.00	0.14
Avail Cap(c_a), veh/h	225	824	857	225	776	805	532	0	0	533	0	498
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.6	15.4	15.4	38.0	16.7	16.7	19.3	0.0	0.0	19.5	0.0	19.8
Incr Delay (d2), s/veh	2.0	2.9	2.7	2.3	3.0	2.9	0.2	0.0	0.0	0.3	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	6.2	6.4	0.3	6.1	6.3	0.4	0.0	0.0	0.7	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	18.3	18.2	40.3	19.7	19.6	19.5	0.0	0.0	19.8	0.0	20.4
LnGrp LOS	D	B	B	D	B	B	B	A	A	B	A	C
Approach Vol, veh/h		1008			920			30			120	
Approach Delay, s/veh		19.2			20.1			19.5			20.2	
Approach LOS		B			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	42.1		30.0	9.0	40.0		30.0				
Change Period (Y+Rc), s	5.0	* 5.5		* 5.7	5.0	* 5.5		* 5.7				
Max Green Setting (Gmax), s	10.0	* 35		* 24	10.0	* 35		* 24				
Max Q Clear Time (g_c+I1), s	2.7	17.2		4.5	4.2	16.8		4.5				
Green Ext Time (p_c), s	0.0	1.9		0.1	0.0	1.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		19.7	
HCM 6th LOS		B	

Notes

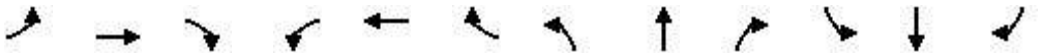
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	323	11	23	239	77	7	34	32	104	45	35
Future Volume (veh/h)	45	323	11	23	239	77	7	34	32	104	45	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	52	371	13	26	275	89	8	39	37	120	52	40
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	402	1077	38	386	769	244	506	256	242	573	342	263
Arrive On Green	0.05	0.31	0.31	0.03	0.29	0.29	0.01	0.29	0.29	0.07	0.35	0.35
Sat Flow, veh/h	1781	3503	122	1781	2655	841	1781	882	837	1781	980	754
Grp Volume(v), veh/h	52	188	196	26	182	182	8	0	76	120	0	92
Grp Sat Flow(s),veh/h/ln	1781	1777	1848	1781	1777	1719	1781	0	1720	1781	0	1735
Q Serve(g_s), s	1.3	5.4	5.4	0.7	5.3	5.5	0.2	0.0	2.2	2.9	0.0	2.4
Cycle Q Clear(g_c), s	1.3	5.4	5.4	0.7	5.3	5.5	0.2	0.0	2.2	2.9	0.0	2.4
Prop In Lane	1.00		0.07	1.00		0.49	1.00		0.49	1.00		0.43
Lane Grp Cap(c), veh/h	402	546	568	386	515	498	506	0	498	573	0	604
V/C Ratio(X)	0.13	0.34	0.35	0.07	0.35	0.37	0.02	0.00	0.15	0.21	0.00	0.15
Avail Cap(c_a), veh/h	753	546	568	769	515	498	922	0	498	884	0	604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.1	17.6	17.6	15.6	18.4	18.5	16.1	0.0	17.3	13.3	0.0	14.7
Incr Delay (d2), s/veh	0.1	1.7	1.7	0.1	1.9	2.1	0.0	0.0	0.6	0.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.4	2.4	0.3	2.4	2.4	0.1	0.0	0.9	1.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	19.3	19.3	15.7	20.3	20.6	16.2	0.0	18.0	13.5	0.0	15.2
LnGrp LOS	B	B	B	B	C	C	B	A	B	B	A	B
Approach Vol, veh/h		436			390			84			212	
Approach Delay, s/veh		18.8			20.1			17.8			14.3	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	26.2	4.7	28.9	7.1	25.0	8.5	25.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	16.0	19.0	16.0	19.0	16.0	19.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	2.7	7.4	2.2	4.4	3.3	7.5	4.9	4.2
Green Ext Time (p_c), s	0.0	2.7	0.0	0.5	0.1	2.6	0.2	0.4

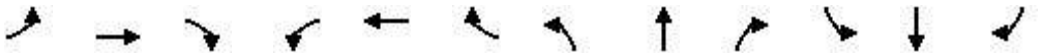
Intersection Summary	
HCM 6th Ctrl Delay	18.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	303	75	21	241	23	68	181	20	27	197	156
Future Volume (veh/h)	217	303	75	21	241	23	68	181	20	27	197	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	231	322	80	22	256	24	72	193	21	29	210	166
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	536	1037	254	433	988	92	438	1074	116	508	581	437
Arrive On Green	0.11	0.37	0.37	0.05	0.30	0.30	0.09	0.33	0.33	0.06	0.30	0.30
Sat Flow, veh/h	1781	2830	693	1781	3287	306	1781	3236	348	1781	1932	1453
Grp Volume(v), veh/h	231	200	202	22	137	143	72	105	109	29	192	184
Grp Sat Flow(s),veh/h/ln	1781	1777	1746	1781	1777	1815	1781	1777	1808	1781	1777	1609
Q Serve(g_s), s	8.4	8.0	8.3	0.8	5.9	5.9	2.6	4.2	4.3	1.1	8.5	9.0
Cycle Q Clear(g_c), s	8.4	8.0	8.3	0.8	5.9	5.9	2.6	4.2	4.3	1.1	8.5	9.0
Prop In Lane	1.00		0.40	1.00		0.17	1.00		0.19	1.00		0.90
Lane Grp Cap(c), veh/h	536	651	640	433	534	546	438	590	600	508	534	484
V/C Ratio(X)	0.43	0.31	0.31	0.05	0.26	0.26	0.16	0.18	0.18	0.06	0.36	0.38
Avail Cap(c_a), veh/h	694	651	640	708	534	546	641	590	600	767	534	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	22.6	22.6	21.6	26.4	26.5	19.9	23.7	23.7	21.0	27.4	27.5
Incr Delay (d2), s/veh	0.8	1.2	1.3	0.1	1.2	1.2	0.2	0.7	0.7	0.1	1.9	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	3.6	3.6	0.4	2.7	2.8	1.1	1.9	1.9	0.5	3.9	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	23.8	23.9	21.7	27.6	27.6	20.1	24.3	24.4	21.1	29.2	29.8
LnGrp LOS	B	C	C	C	C	C	C	C	C	C	C	C
Approach Vol, veh/h		633			302			286			405	
Approach Delay, s/veh		22.3			27.2			23.3			28.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	41.6	13.6	35.0	16.1	35.0	10.5	38.1
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.8	10.3	4.6	11.0	10.4	7.9	3.1	6.3
Green Ext Time (p_c), s	0.0	4.3	0.2	4.0	0.7	3.0	0.1	2.3

Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C



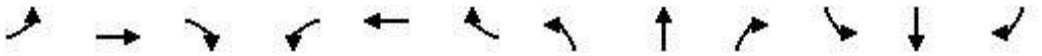
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	579	23	3	467	13	14	3	6	8	0	49
Future Volume (veh/h)	50	579	23	3	467	13	14	3	6	8	0	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	636	25	3	513	14	15	3	7	9	0	54
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	504	1513	59	446	1534	42	350	85	105	141	34	338
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.25	0.25	0.25	0.25	0.00	0.25
Sat Flow, veh/h	876	3486	137	774	3534	96	742	344	422	89	138	1367
Grp Volume(v), veh/h	55	324	337	3	258	269	25	0	0	63	0	0
Grp Sat Flow(s),veh/h/ln	876	1777	1846	774	1777	1853	1508	0	0	1595	0	0
Q Serve(g_s), s	1.5	4.4	4.4	0.1	3.3	3.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.9	4.4	4.4	4.5	3.3	3.3	0.4	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.05	0.60		0.28	0.14		0.86
Lane Grp Cap(c), veh/h	504	771	801	446	771	804	540	0	0	514	0	0
V/C Ratio(X)	0.11	0.42	0.42	0.01	0.33	0.33	0.05	0.00	0.00	0.12	0.00	0.00
Avail Cap(c_a), veh/h	504	771	801	782	1543	1609	1446	0	0	1480	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.1	6.8	6.8	8.3	6.5	6.5	9.9	0.0	0.0	10.2	0.0	0.0
Incr Delay (d2), s/veh	0.4	1.7	1.6	0.0	0.5	0.5	0.1	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.5	1.5	0.0	0.9	1.0	0.1	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.5	8.4	8.4	8.3	7.0	7.0	10.0	0.0	0.0	10.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	B	A	A
Approach Vol, veh/h		716			530			25			63	
Approach Delay, s/veh		8.4			7.0			10.0			10.4	
Approach LOS		A			A			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		21.0		13.6		21.0		13.6				
Change Period (Y+Rc), s		6.0		5.0		* 6		5.0				
Max Green Setting (Gmax), s		14.0		30.0		* 30		30.0				
Max Q Clear Time (g_c+I1), s		6.9		3.1		6.5		2.4				
Green Ext Time (p_c), s		3.9		0.6		6.3		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			8.0									
HCM 6th LOS			A									

Notes

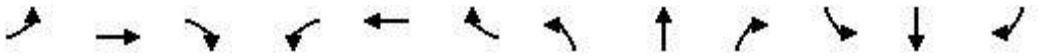
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	635	38	8	608	6	27	8	19	10	8	12
Future Volume (veh/h)	10	635	38	8	608	6	27	8	19	10	8	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	747	45	9	715	7	32	9	22	12	9	14
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	387	1674	101	359	1773	17	309	98	170	217	168	203
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	731	3405	205	685	3606	35	689	310	536	431	530	641
Grp Volume(v), veh/h	12	390	402	9	352	370	63	0	0	35	0	0
Grp Sat Flow(s),veh/h/ln	731	1777	1833	685	1777	1864	1535	0	0	1601	0	0
Q Serve(g_s), s	0.6	8.6	8.6	0.5	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.2	8.6	8.6	9.1	7.5	7.5	1.5	0.0	0.0	0.8	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.02	0.51		0.35	0.34		0.40
Lane Grp Cap(c), veh/h	387	874	901	359	874	916	577	0	0	588	0	0
V/C Ratio(X)	0.03	0.45	0.45	0.03	0.40	0.40	0.11	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	387	874	901	359	874	916	577	0	0	588	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.3	9.9	9.9	12.9	9.7	9.7	14.5	0.0	0.0	14.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.6	1.6	0.1	1.4	1.3	0.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.2	3.3	0.1	2.8	2.9	0.6	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	11.6	11.5	13.0	11.1	11.0	14.9	0.0	0.0	14.5	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		804			731			63			35	
Approach Delay, s/veh		11.6			11.0			14.9			14.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		25.0		35.0		25.0				
Change Period (Y+Rc), s		5.5		6.0		5.5		6.0				
Max Green Setting (Gmax), s		29.5		19.0		29.5		19.0				
Max Q Clear Time (g_c+I1), s		10.6		2.8		11.1		3.5				
Green Ext Time (p_c), s		8.7		0.1		7.7		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			11.5									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	665	47	26	677	10	47	35	18	10	43	40
Future Volume (veh/h)	59	665	47	26	677	10	47	35	18	10	43	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	69	773	55	30	787	12	55	41	21	12	50	47
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	517	1853	132	476	1863	28	167	72	32	84	91	78
Arrive On Green	0.07	0.55	0.55	0.04	0.52	0.52	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1781	3365	239	1781	3583	55	694	690	303	115	871	747
Grp Volume(v), veh/h	69	408	420	30	390	409	117	0	0	109	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1827	1781	1777	1861	1686	0	0	1733	0	0
Q Serve(g_s), s	0.9	7.5	7.5	0.4	7.5	7.5	0.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	7.5	7.5	0.4	7.5	7.5	3.5	0.0	0.0	3.3	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.03	0.47		0.18	0.11		0.43
Lane Grp Cap(c), veh/h	517	979	1006	476	924	968	271	0	0	252	0	0
V/C Ratio(X)	0.13	0.42	0.42	0.06	0.42	0.42	0.43	0.00	0.00	0.43	0.00	0.00
Avail Cap(c_a), veh/h	1190	979	1006	1044	924	968	628	0	0	647	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.4	7.3	7.3	5.8	8.2	8.2	23.9	0.0	0.0	23.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.3	0.0	1.4	1.4	0.8	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.4	2.5	0.1	2.5	2.6	1.5	0.0	0.0	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.5	8.6	8.6	5.8	9.6	9.6	24.7	0.0	0.0	24.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	A	C	A	A
Approach Vol, veh/h		897			829			117			109	
Approach Delay, s/veh		8.4			9.5			24.7			24.7	
Approach LOS		A			A			C			C	

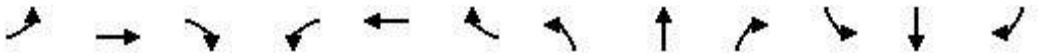
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	36.7		11.8	8.9	35.0		11.8				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	20.0	29.0		19.0	25.0	29.0		19.0				
Max Q Clear Time (g_c+I1), s	2.4	9.5		5.3	2.9	9.5		5.5				
Green Ext Time (p_c), s	0.0	4.1		0.4	0.0	3.9		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		10.7	
HCM 6th LOS		B	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	733	41	175	771	26	38	28	119	24	43	23
Future Volume (veh/h)	26	733	41	175	771	26	38	28	119	24	43	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	28	788	44	188	829	28	41	30	128	26	46	25
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	429	1789	881	487	1930	65	306	44	187	221	145	79
Arrive On Green	0.04	0.50	0.50	0.09	0.55	0.55	0.05	0.14	0.14	0.04	0.13	0.13
Sat Flow, veh/h	1781	3554	1585	1781	3507	118	1781	310	1322	1781	1140	619
Grp Volume(v), veh/h	28	788	44	188	420	437	41	0	158	26	0	71
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1849	1781	0	1632	1781	0	1759
Q Serve(g_s), s	0.6	11.1	1.0	3.6	10.9	10.9	1.5	0.0	7.2	1.0	0.0	2.9
Cycle Q Clear(g_c), s	0.6	11.1	1.0	3.6	10.9	10.9	1.5	0.0	7.2	1.0	0.0	2.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.81	1.00		0.35
Lane Grp Cap(c), veh/h	429	1789	881	487	978	1017	306	0	230	221	0	223
V/C Ratio(X)	0.07	0.44	0.05	0.39	0.43	0.43	0.13	0.00	0.69	0.12	0.00	0.32
Avail Cap(c_a), veh/h	1060	1789	881	1034	978	1017	688	0	530	629	0	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.6	12.4	8.0	8.0	10.4	10.4	27.1	0.0	32.1	28.0	0.0	31.2
Incr Delay (d2), s/veh	0.0	0.8	0.1	0.4	1.4	1.3	0.1	0.0	2.7	0.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.0	0.3	1.1	3.9	4.1	0.6	0.0	2.9	0.4	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.7	13.2	8.1	8.4	11.8	11.7	27.2	0.0	34.7	28.1	0.0	31.8
LnGrp LOS	A	B	A	A	B	B	C	A	C	C	A	C
Approach Vol, veh/h		860			1045			199			97	
Approach Delay, s/veh		12.8			11.1			33.2			30.8	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	45.0	8.1	14.5	7.2	48.7	7.0	15.6
Change Period (Y+Rc), s	4.0	5.5	4.0	4.5	4.0	5.5	4.0	4.5
Max Green Setting (Gmax), s	31.0	39.5	21.0	25.5	31.0	39.5	21.0	25.5
Max Q Clear Time (g_c+I1), s	5.6	13.1	3.5	4.9	2.6	12.9	3.0	9.2
Green Ext Time (p_c), s	0.4	4.6	0.0	0.2	0.0	4.3	0.0	0.6

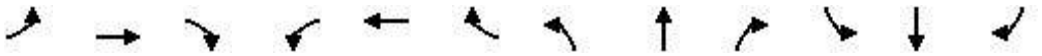
Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	344	56	108	293	11	34	27	118	42	32	40
Future Volume (veh/h)	12	344	56	108	293	11	34	27	118	42	32	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	374	61	117	318	12	37	29	128	46	35	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	1125	179	289	807	32	537	530	449	545	222	273
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.05	0.28	0.28	0.05	0.29	0.29
Sat Flow, veh/h	34	2958	470	520	2121	84	1781	1870	1585	1781	764	938
Grp Volume(v), veh/h	238	0	210	206	0	241	37	29	128	46	0	78
Grp Sat Flow(s),veh/h/ln	1844	0	1617	1038	0	1687	1781	1870	1585	1781	0	1702
Q Serve(g_s), s	0.0	0.0	5.7	6.2	0.0	6.4	0.9	0.7	3.9	1.1	0.0	2.1
Cycle Q Clear(g_c), s	5.6	0.0	5.7	11.9	0.0	6.4	0.9	0.7	3.9	1.1	0.0	2.1
Prop In Lane	0.05		0.29	0.57		0.05	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	763	0	615	486	0	642	537	530	449	545	0	495
V/C Ratio(X)	0.31	0.00	0.34	0.42	0.00	0.38	0.07	0.05	0.29	0.08	0.00	0.16
Avail Cap(c_a), veh/h	763	0	615	486	0	642	758	530	449	754	0	495
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.6	0.0	13.6	16.1	0.0	13.8	14.2	16.1	17.3	14.0	0.0	16.3
Incr Delay (d2), s/veh	1.1	0.0	1.5	2.7	0.0	1.7	0.0	0.2	1.6	0.0	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	2.1	2.5	0.0	2.4	0.3	0.3	1.4	0.4	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.7	0.0	15.1	18.8	0.0	15.5	14.2	16.3	18.9	14.0	0.0	17.0
LnGrp LOS	B	A	B	B	A	B	B	B	B	B	A	B
Approach Vol, veh/h		448			447			194			124	
Approach Delay, s/veh		14.9			17.0			17.6			15.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		30.0	7.3	24.5		30.0	7.8	24.0				
Change Period (Y+Rc), s		6.5	4.5	6.5		6.5	4.5	6.5				
Max Green Setting (Gmax), s		23.5	10.5	17.5		23.5	10.5	17.5				
Max Q Clear Time (g_c+I1), s		7.7	2.9	4.1		13.9	3.1	5.9				
Green Ext Time (p_c), s		2.3	0.0	0.2		1.9	0.0	0.3				

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B



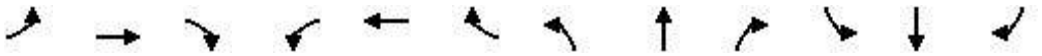
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	39	15	18	24	65	25	205	28	100	187	36
Future Volume (veh/h)	41	39	15	18	24	65	25	205	28	100	187	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	45	17	21	28	76	29	238	33	116	217	42
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	785	665	251	812	219	593	266	363	50	286	463	88
Arrive On Green	0.05	0.51	0.51	0.03	0.49	0.49	0.04	0.12	0.12	0.08	0.16	0.16
Sat Flow, veh/h	1781	1294	489	1781	445	1208	1781	3140	430	1781	2979	566
Grp Volume(v), veh/h	48	0	62	21	0	104	29	133	138	116	128	131
Grp Sat Flow(s),veh/h/ln	1781	0	1782	1781	0	1653	1781	1777	1793	1781	1777	1768
Q Serve(g_s), s	0.9	0.0	1.2	0.4	0.0	2.4	1.0	5.0	5.2	3.9	4.6	4.8
Cycle Q Clear(g_c), s	0.9	0.0	1.2	0.4	0.0	2.4	1.0	5.0	5.2	3.9	4.6	4.8
Prop In Lane	1.00		0.27	1.00		0.73	1.00		0.24	1.00		0.32
Lane Grp Cap(c), veh/h	785	0	917	812	0	812	266	206	207	286	276	275
V/C Ratio(X)	0.06	0.00	0.07	0.03	0.00	0.13	0.11	0.65	0.66	0.41	0.46	0.48
Avail Cap(c_a), veh/h	1232	0	917	1301	0	812	741	615	620	689	615	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.6	0.0	8.6	8.2	0.0	9.7	25.7	29.7	29.8	23.9	27.0	27.1
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.0	0.0	0.3	0.1	2.6	2.7	0.3	0.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.5	0.1	0.0	0.9	0.4	2.1	2.2	1.5	1.8	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.6	0.0	8.7	8.2	0.0	10.0	25.7	32.3	32.4	24.2	27.9	28.0
LnGrp LOS	A	A	A	A	A	B	C	C	C	C	C	C
Approach Vol, veh/h		110			125			300			375	
Approach Delay, s/veh		8.2			9.7			31.7			26.8	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.7	41.6	6.3	16.6	7.3	40.0	9.1	13.8
Change Period (Y+Rc), s	3.7	* 5.5	3.7	* 5.7	3.7	* 5.5	3.7	* 5.7
Max Green Setting (Gmax), s	21.3	* 35	21.3	* 24	21.3	* 35	21.3	* 24
Max Q Clear Time (g_c+I1), s	2.4	3.2	3.0	6.8	2.9	4.4	5.9	7.2
Green Ext Time (p_c), s	0.0	0.2	0.0	0.9	0.0	0.5	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	443	71	72	11	71	72	53	245	16	137	501	472
Future Volume (veh/h)	443	71	72	11	71	72	53	245	16	137	501	472
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	764	122	124	19	122	124	91	422	28	236	864	814
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	524	258	263	257	214	181	223	920	61	446	1160	858
Arrive On Green	0.21	0.30	0.30	0.03	0.11	0.11	0.06	0.27	0.27	0.12	0.33	0.33
Sat Flow, veh/h	1781	850	864	1781	1870	1585	1781	3383	224	1781	3554	1585
Grp Volume(v), veh/h	764	0	246	19	122	124	91	221	229	236	864	814
Grp Sat Flow(s),veh/h/ln	1781	0	1715	1781	1870	1585	1781	1777	1830	1781	1777	1585
Q Serve(g_s), s	18.8	0.0	10.2	0.8	5.4	6.6	3.1	9.0	9.1	8.1	18.9	28.6
Cycle Q Clear(g_c), s	18.8	0.0	10.2	0.8	5.4	6.6	3.1	9.0	9.1	8.1	18.9	28.6
Prop In Lane	1.00		0.50	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	524	0	521	257	214	181	223	483	498	446	1160	858
V/C Ratio(X)	1.46	0.00	0.47	0.07	0.57	0.68	0.41	0.46	0.46	0.53	0.74	0.95
Avail Cap(c_a), veh/h	524	0	521	595	509	431	497	483	498	521	1160	858
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	24.8	32.7	36.7	37.2	22.2	26.5	26.5	19.2	26.2	18.9
Incr Delay (d2), s/veh	216.0	0.0	0.5	0.0	1.8	3.4	0.4	3.1	3.0	0.4	4.4	20.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	33.4	0.0	4.1	0.3	2.5	0.2	1.3	4.1	4.2	3.2	8.3	18.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	243.8	0.0	25.3	32.8	38.5	40.6	22.6	29.6	29.6	19.6	30.6	39.5
LnGrp LOS	F	A	C	C	D	D	C	C	C	B	C	D
Approach Vol, veh/h		1010			265			541			1914	
Approach Delay, s/veh		190.6			39.1			28.4			33.0	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	32.8	11.5	34.8	25.0	16.2	16.3	30.0
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2
Max Green Setting (Gmax), s	* 19	* 24	* 19	* 24	* 19	* 24	* 14	* 24
Max Q Clear Time (g_c+I1), s	2.8	12.2	5.1	30.6	20.8	8.6	10.1	11.1
Green Ext Time (p_c), s	0.0	0.9	0.0	0.0	0.0	0.7	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	75.4
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

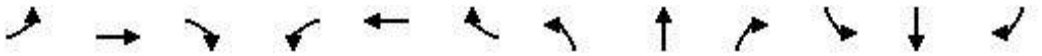
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	233	11	621	198	17	936
Future Volume (veh/h)	233	11	621	198	17	936
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	457	22	1218	0	33	1835
Peak Hour Factor	0.51	0.51	0.51	0.51	0.51	0.51
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	713	634	1421		88	1173
Arrive On Green	0.40	0.40	0.40	0.00	0.40	0.40
Sat Flow, veh/h	1781	1585	3647	1585	14	3018
Grp Volume(v), veh/h	457	22	1218	0	882	986
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1329	1617
Q Serve(g_s), s	9.3	0.4	14.1	0.0	3.9	18.0
Cycle Q Clear(g_c), s	9.3	0.4	14.1	0.0	18.0	18.0
Prop In Lane	1.00	1.00		1.00	0.04	
Lane Grp Cap(c), veh/h	713	634	1421		615	647
V/C Ratio(X)	0.64	0.03	0.86		1.44	1.52
Avail Cap(c_a), veh/h	713	634	1421		615	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	10.9	8.2	12.3	0.0	13.7	13.5
Incr Delay (d2), s/veh	4.4	0.1	6.9	0.0	205.1	243.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.1	5.4	0.0	39.0	48.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.3	8.3	19.2	0.0	218.8	257.1
LnGrp LOS	B	A	B		F	F
Approach Vol, veh/h	479		1218			1868
Approach Delay, s/veh	15.0		19.2			239.0
Approach LOS	B		B			F

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	22.5			22.5	22.5
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	18.0			18.0	18.0
Max Q Clear Time (g_c+I1), s	16.1			20.0	11.3
Green Ext Time (p_c), s	1.4			0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	133.8
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



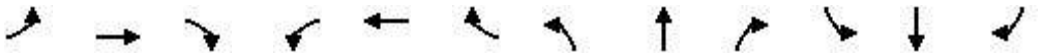
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	11	18	1	20	2	20	354	2	2	472	129
Future Volume (veh/h)	66	11	18	1	20	2	20	354	2	2	472	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	19	32	2	35	4	35	621	4	4	828	226
Peak Hour Factor	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	64	74	74	425	47	118	1756	11	67	1459	397
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	947	244	282	20	1632	179	85	3251	21	2	2701	734
Grp Volume(v), veh/h	167	0	0	41	0	0	329	0	331	575	0	483
Grp Sat Flow(s),veh/h/ln	1474	0	0	1830	0	0	1658	0	1698	1867	0	1570
Q Serve(g_s), s	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	11.3
Cycle Q Clear(g_c), s	5.1	0.0	0.0	0.9	0.0	0.0	5.4	0.0	6.1	11.3	0.0	11.3
Prop In Lane	0.69		0.19	0.05		0.10	0.11		0.01	0.01		0.47
Lane Grp Cap(c), veh/h	494	0	0	545	0	0	968	0	918	1074	0	848
V/C Ratio(X)	0.34	0.00	0.00	0.08	0.00	0.00	0.34	0.00	0.36	0.53	0.00	0.57
Avail Cap(c_a), veh/h	1273	0	0	1546	0	0	1374	0	1384	1584	0	1280
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	0.0	15.4	0.0	0.0	7.1	0.0	7.2	8.4	0.0	8.4
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.5	0.9	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	0.4	0.0	0.0	1.7	0.0	1.7	3.9	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	0.0	0.0	15.6	0.0	0.0	7.5	0.0	7.8	9.3	0.0	9.7
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		167			41			660			1058	
Approach Delay, s/veh		17.3			15.6			7.6			9.5	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		20.4		34.8		20.4		34.8				
Change Period (Y+Rc), s		6.0		5.0		* 6		5.0				
Max Green Setting (Gmax), s		44.0		45.0		* 45		45.0				
Max Q Clear Time (g_c+I1), s		7.1		13.3		2.9		8.1				
Green Ext Time (p_c), s		1.0		16.5		0.4		9.5				

Intersection Summary		
HCM 6th Ctrl Delay	9.7	
HCM 6th LOS	A	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	561	18	21	522	310	17	38	34	295	191	222
Future Volume (veh/h)	219	561	18	21	522	310	17	38	34	295	191	222
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	238	610	0	23	567	0	18	41	0	321	208	0
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	1681		85	1122		177	380		358	192	
Arrive On Green	0.21	0.47	0.00	0.05	0.32	0.00	0.32	0.32	0.00	0.32	0.32	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	405	1204	1585	940	609	1585
Grp Volume(v), veh/h	238	610	0	23	567	0	59	0	0	529	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1609	0	1585	1548	0	1585
Q Serve(g_s), s	11.6	10.4	0.0	1.2	12.3	0.0	0.0	0.0	0.0	27.9	0.0	0.0
Cycle Q Clear(g_c), s	11.6	10.4	0.0	1.2	12.3	0.0	2.1	0.0	0.0	30.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.31		1.00	0.61		1.00
Lane Grp Cap(c), veh/h	375	1681		85	1122		558	0		550	0	
V/C Ratio(X)	0.63	0.36		0.27	0.51		0.11	0.00		0.96	0.00	
Avail Cap(c_a), veh/h	375	1681		366	1122		558	0		550	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.2	15.9	0.0	43.6	26.5	0.0	23.0	0.0	0.0	33.5	0.0	0.0
Incr Delay (d2), s/veh	8.0	0.6	0.0	2.4	1.6	0.0	0.2	0.0	0.0	29.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	4.2	0.0	0.6	5.4	0.0	1.0	0.0	0.0	16.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	16.5	0.0	46.0	28.1	0.0	23.1	0.0	0.0	62.8	0.0	0.0
LnGrp LOS	D	B		D	C		C	A		E	A	
Approach Vol, veh/h		848			590			59			529	
Approach Delay, s/veh		23.7			28.8			23.1			62.8	
Approach LOS		C			C			C			E	

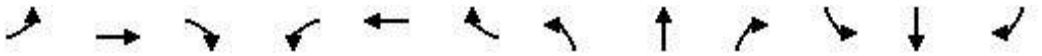
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	50.0		35.0	25.0	35.0		35.0				
Change Period (Y+Rc), s	5.5	* 5		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	19.5	* 32		30.0	20.0	30.0		30.0				
Max Q Clear Time (g_c+I1), s	3.2	12.4		32.0	13.6	14.3		4.1				
Green Ext Time (p_c), s	0.0	6.9		0.0	0.6	5.7		0.5				

Intersection Summary	
HCM 6th Ctrl Delay	35.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	443	71	72	11	71	72	53	245	16	137	501	472
Future Volume (veh/h)	443	71	72	11	71	72	53	245	16	137	501	472
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	764	122	124	19	122	124	91	422	28	236	864	814
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	885	222	225	302	258	219	246	837	55	450	1069	713
Arrive On Green	0.15	0.26	0.26	0.03	0.14	0.14	0.07	0.25	0.25	0.12	0.30	0.30
Sat Flow, veh/h	3456	850	864	1781	1870	1585	1781	3383	224	1781	3554	1585
Grp Volume(v), veh/h	764	0	246	19	122	124	91	221	229	236	864	814
Grp Sat Flow(s),veh/h/ln	1728	0	1715	1781	1870	1585	1781	1777	1830	1781	1777	1585
Q Serve(g_s), s	10.8	0.0	9.0	0.7	4.4	5.3	2.7	7.7	7.8	7.0	16.3	21.8
Cycle Q Clear(g_c), s	10.8	0.0	9.0	0.7	4.4	5.3	2.7	7.7	7.8	7.0	16.3	21.8
Prop In Lane	1.00		0.50	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	885	0	447	302	258	219	246	440	453	450	1069	713
V/C Ratio(X)	0.86	0.00	0.55	0.06	0.47	0.57	0.37	0.50	0.51	0.52	0.81	1.14
Avail Cap(c_a), veh/h	885	0	447	402	300	254	269	440	453	499	1069	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	23.1	25.6	28.8	29.2	19.3	23.4	23.4	17.1	23.4	19.9
Incr Delay (d2), s/veh	8.4	0.0	1.2	0.0	1.0	1.7	0.3	4.1	4.0	0.4	6.6	79.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	3.6	0.3	2.0	2.0	1.0	3.5	3.7	2.6	7.2	26.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	0.0	24.3	25.6	29.8	30.9	19.7	27.5	27.4	17.5	30.0	99.7
LnGrp LOS	C	A	C	C	C	C	B	C	C	B	C	F
Approach Vol, veh/h		1010			265			541			1914	
Approach Delay, s/veh		30.3			30.0			26.2			58.1	
Approach LOS		C			C			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	25.1	11.2	28.0	17.0	16.2	15.1	24.1
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2	* 6.2
Max Green Setting (Gmax), s	* 6	* 16	* 6	* 22	* 11	* 12	* 11	* 17
Max Q Clear Time (g_c+I1), s	2.7	11.0	4.7	23.8	12.8	7.3	9.0	9.8
Green Ext Time (p_c), s	0.0	0.5	0.0	0.0	0.0	0.3	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	43.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

EL DORADO
KANSAS

TO: City Commission
FROM: David Dillner, City Manager
SUBJ: Civic Center Disposition
DATE: October 25, 2024

The Chamber of Commerce recently inquired about the status of the Civic Center and the City's plans for the facility. The City has not allocated funds to the facility beyond what is necessary for normal operations.

The City Manager proposes moving forward with a professional assessment of the facility with the purpose of developing options for investment. This process requires the solicitation of an architect to conduct a facility assessment and develop options with cost estimates for continued use of the Civic Center.

Following the conclusion of the assessment, the City Commission will have options to consider and can also obtain feedback from the public to assist the decision-making process.