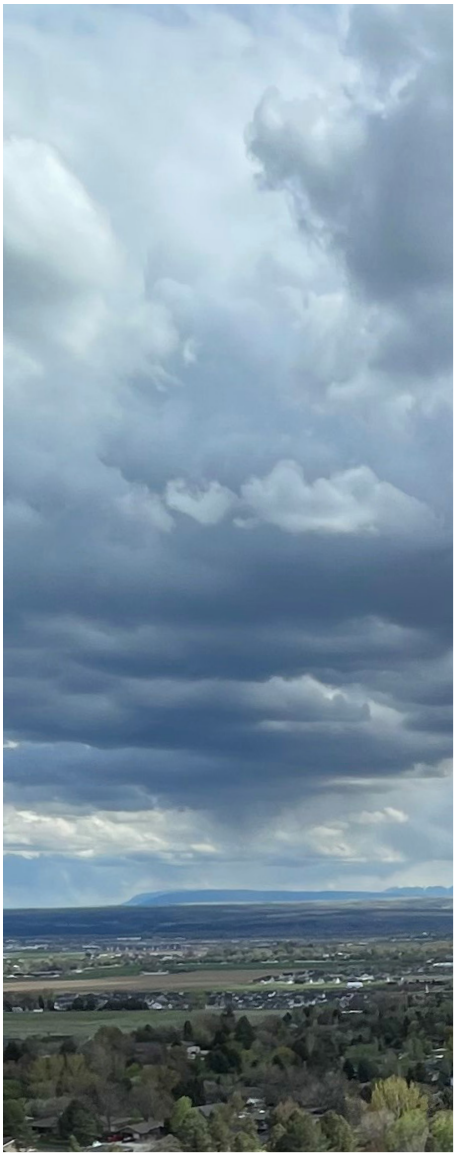

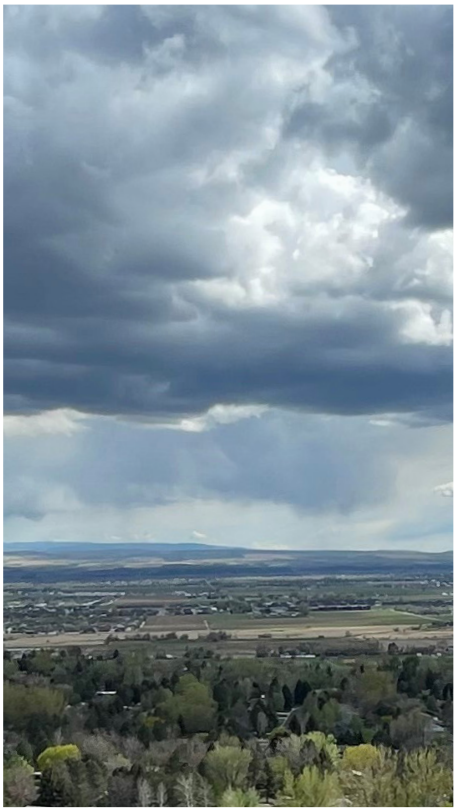

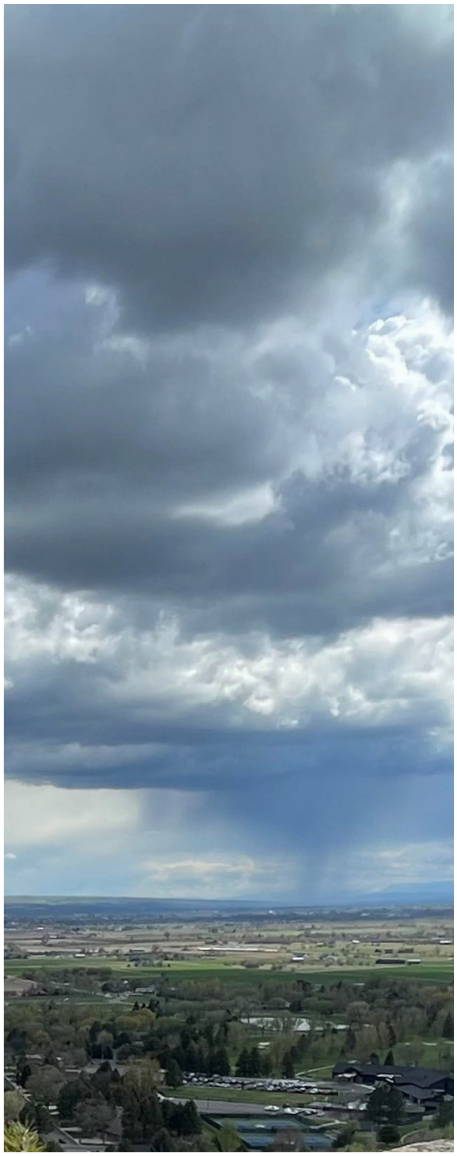

WEST BILLINGS NEIGHBORHOOD PLAN

FINAL REPORT

Executive Summary

The West Billings Neighborhood Plan Update serves to update the 2001 West Billings Plan and the 2016 West End Multi-Modal Planning Study. Taken together, this plan, the Billings Heights Neighborhood Plan and the Billings 2045 Plan, will serve as Billings' new Future Land Use Plan and bring the City of Billings into compliance with the recently passed Montana Land Use Planning Act, which imposes new requirements on such planning documents.

The West Billings Neighborhood Plan provides a coordinated framework for guiding land use, transportation, and infrastructure investment in one of Yellowstone County's fastest-growing areas. The plan area encompasses approximately 15,000 acres between Shiloh Road and 64th Street West, from Interstate 90 to the Rimrocks, and includes land within the City of Billings, Yellowstone County, and areas outside zoning jurisdiction.

Since adoption of the 2001 West Billings Plan, the area has experienced rapid population growth, substantial housing development, and major infrastructure expansion, accompanied by a steady conversion of agricultural land to urban and suburban uses. This update responds to those changes by integrating current demographic, housing, economic, and transportation data with extensive public engagement to guide growth over the next twenty years.

A cornerstone of the plan is the adoption of Future Land Use Categories and a Future Land Use Map (FLUM) in compliance with the Montana Land Use Planning Act (MLUPA). These tools formalize the community's vision for development, improve predictability for landowners, and align zoning decisions with long-term infrastructure capacity. The FLUM establishes a range of land use categories—from rural agricultural areas to higher-intensity urban nodes—each with defined density ranges, building types, and mobility characteristics.

The plan emphasizes the integration of land use and transportation planning. Existing development patterns are characterized by disconnected street networks, limited pedestrian and bicycle infrastructure, and constrained transit service. To address these conditions and respond to public input, the plan promotes interconnected streets, expanded active transportation facilities, and land use patterns that support future transit service.

This plan creates a legally compliant roadmap for accommodating growth while preserving the character, safety, and quality of life valued by West Billings residents.

Acknowledgments

The project team is grateful to those who gave their time and efforts to guide and inform the production of this plan. Like the 2001 plan, The West Billings Neighborhood Plan Update is a product of the contributions of interdisciplinary professionals, elected officials, and members of the public. The combined efforts of everyone who participated in creating this plan have given Billings its first future land use map, which will guide the future of the West End.

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CHAPTER ONE

INTRODUCTION

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Plan Overview

Context

The “West End” of Billings is a collection of neighborhoods generally known as the area west of 24th St., south of the Rims, and north of I-90, with its western boundary moving ever further west with development.

The West Billings Neighborhood Plan encompasses approximately 15,000 acres of the West End, including areas in the Billings city limits, and unincorporated areas of Yellowstone County. The plan boundary includes developed neighborhoods, commercial areas, working agricultural lands, and natural areas. Because of differing jurisdictional boundaries, this plan uses two different boundaries; one for transportation analysis, which corresponds to the MPO (Metropolitan Planning Organization) boundaries, and another boundary for land use analysis, which includes the area between Shiloh Road and 64th Street West, extending to 70th Street West north of Grand Avenue, as shown in Figure 1.1 to the right.

The 2016 City of Billings Growth Policy acknowledges the importance of West Billings and the likelihood of continued growth of the area. This Plan identifies guiding principles, goals and policies related to growth and land use planning within the West Billings Plan area. It creates land use categories and a future land use map that will guide policymakers and landowners over the next 20 years.

Purpose

The purpose of this plan is to take stock and look forward. It evaluates existing conditions in West Billings and states the community’s shared vision for its future by creating goals and recommendations for future growth. This neighborhood plan was created in compliance with the Montana Land Use Planning Act (MLUPA) as a Neighborhood Land Use Plan. The Future Land Use Map (FLUM) illustrates the general pattern of future land uses across the plan area and serves as a visual guide for how the community vision is intended to be implemented.

The West Billings Neighborhood Plan will inform zoning and future development decisions and document community priorities. It outlines a vision for West Billings that aligns growth with infrastructure improvements, prioritizes development adjacent to existing infrastructure, expands options for walking and biking, and enhances safety throughout the plan area.

Updating the 2001 Plan

The 2001 West Billings Plan is the current neighborhood plan for West Billings. In the 24 years since its adoption, much has changed. The population of the area has more than doubled, and the number of dwellings has more than tripled. Given the growth, regulatory changes, and local infrastructure investments, the time is right for an updated plan for West Billings.

The planning effort that resulted in the 2001

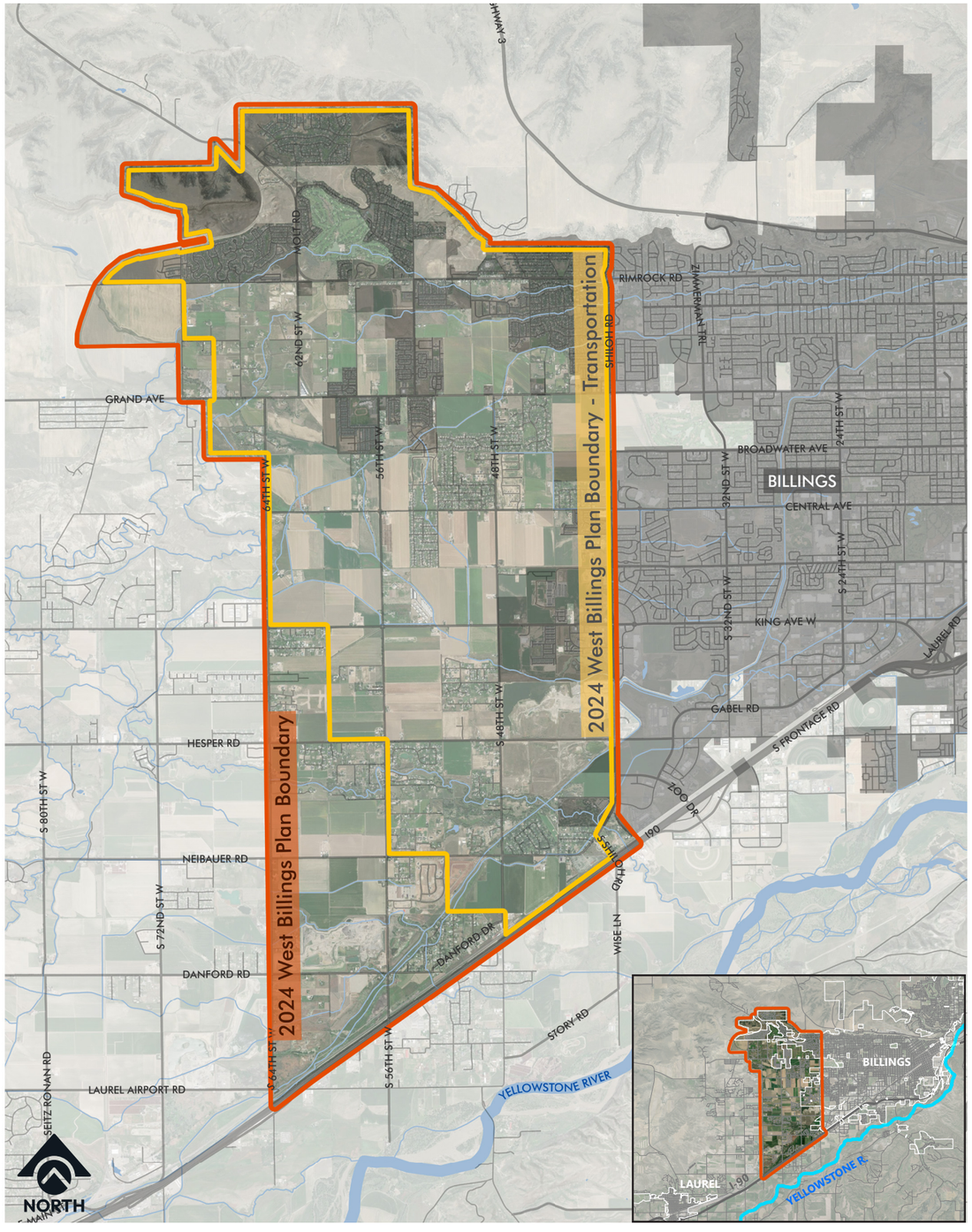

Figure 1.1 - Plan Area Map

Plan included extensive public engagement involving public meetings, surveys, visual preference surveys, and general discussions. While much has changed since that plan's completion, many elements are still relevant and important to the community. For that reason, the current plan relies on that previous document as the fundamental guide to developing the future of West Billings. The Plan is not a replacement of the 2001 Plan, but rather an update to a document that has guided the community for over the past 20 years. While the goals, policies, and future land uses are updated with this plan, the foundations remain the same.

The overall vision remains the same: "Create an achievable plan to meet the community's shared vision for the future of West Billings, enabling it to thrive on growth and change through innovative, compatible land use, and responsible development."

Themes from the 2001 plan include Planned Growth, Appropriate Land Utilization, Achieving a Community Character, and Enhancement of Public Safety, Open Space, Waterways and Scenic Resources. The key elements of the plan include:

- Establish development patterns that use land more efficiently
- Develop municipal water and wastewater facilities and other public services to support urban growth in West Billings
- Plan for the orderly and efficient urbanization of agricultural lands
- Create developments in West Billings that are compatible with their surroundings and provide a safe and desirable environment for residents, shoppers, workers, and visitors
- Identify and protect open spaces, flood channels, waterways, and scenic resources in West Billings

Many of these elements are carried through to this plan and updated with existing conditions.

Multi-Modal Update

In addition to the update to the 2001 West Billings Plan, this plan also updates the 2016 West End Multi-modal Planning Study ("Study"). The Study evaluated the cumulative effect of ongoing and projected future land development and population growth on the multi-modal transportation system for the area of Billings west of Shiloh Road. This Plan includes an update to that Study by incorporating current traffic counts with projected future development. That information was used to evaluate and prioritize potential project needs to help the City of Billings and Yellowstone County coordinate transportation improvements with projected land development. A summary of the existing conditions is in Chapter 2.

Growth Policy Alignment

Montana statute requires that neighborhood plans be consistent with growth policies. The Montana Land Use Planning Act now refers to a growth policy as a *land use plan*. Billings' land use plan, Billings 2045, will be adopted at roughly the same time as the West Billings Neighborhood Plan Update in mid 2026. The West Billings future land use map will be adopted as part of the Billings 2045 Plan, and the future land use categories established during the West Billings planning process will also be applied to the entire Billings zoning jurisdiction. Therefore, the two plans will be consistent in their approach to land use. Should any inconsistencies be within this Plan and Billings 2045, Billings 2045 takes precedence.

Jurisdictional Differences

The planning area includes land within the City of Billings and unincorporated areas of Yellowstone County. In addition, a portion of the planning area is located outside of the zoning jurisdiction. This Plan recognizes the jurisdictional differences between the City of Billings and Yellowstone County, which are reflected throughout the document.

Existing Conditions Overview

The following provides an overview of the existing conditions within the Plan Area. The Background Report within Chapter 2 provides a complete assessment of the existing conditions. The background information collected directly informed the development of the goals and policy recommendations outlined in this Plan.

Population

The West Billings Neighborhood has experienced substantial growth over the past two decades. According to census data, the population of West Billings surged from 6,226 in 2000 to 16,182 in 2020, a 160% growth rate. In comparison, Yellowstone County saw a growth rate of 27.35% during the same period, indicating the neighborhood's significant appeal.

Housing

The total number of housing units increased 208%, from 2,155 in 2000 to 6,644 in 2020. The majority of dwelling units are owner-occupied, accounting for 71.4% of the total, while renter-occupied units make up 28.6%. Vacancy rates are relatively low at 5.4%, suggesting a high demand for housing in the Plan Area. The area's housing stock is relatively new, with the vast majority of the neighborhood built within the past 40 years. Single family homes are the predominant housing type.

Land Use

The current land uses within the Plan Area include residential, commercial, industrial, agricultural, and public lands.

Land use in the West Billings Plan Area has changed significantly since the adoption of the 2001 West Billings Plan. In 2003, agricultural use dominated the Plan Area, accounting for 56% of the land, while developed land comprised only 16%. In 2024, agricultural land use has decreased

2003

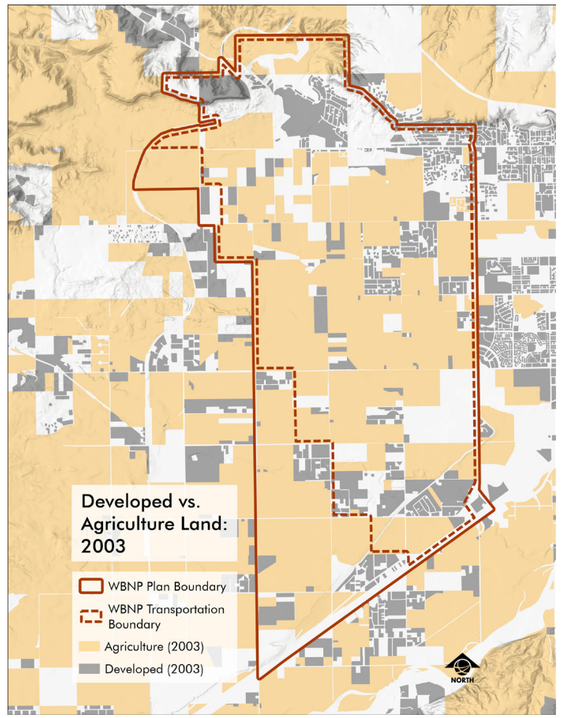

Figure 1.2 - Developed vs. Agriculture (2003)

2024

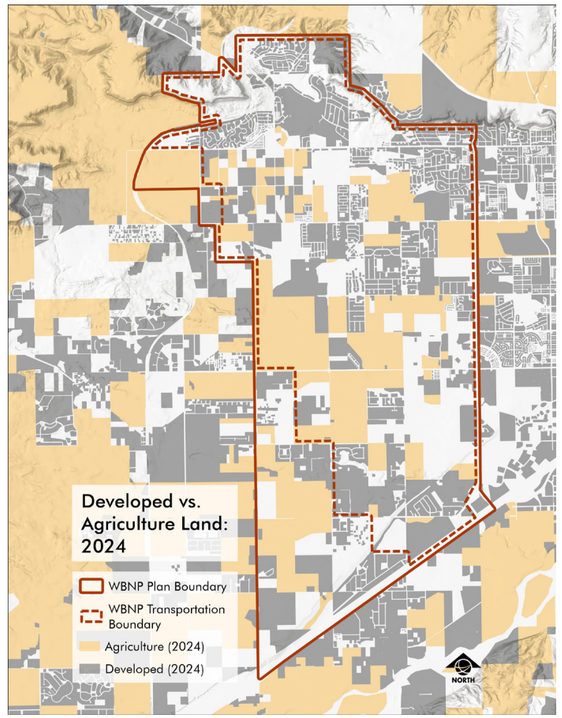

Figure 1.3 - Developed vs. Agriculture (2024)

Agricultural land use in the West Billings Plan Area is rapidly disappearing - See Chapter 2, Background Report for more details.

to 28% and developed land increased to 36%. More specifically, in 2024, residential usage constitutes about 29% of total land use within the Plan rea, while commercial, mixed-use, and industrial uses make up about 2%, 2%, and 3% respectively.

Vacant land, excluding agriculture and public lands accounts for 20% of the total plan area, with about 3,000 acres remaining unused in the plan area as of 2024.

See Figure 1.2 and 1.3 on above for visual reference.

Economic Development

Much of the economic activity within the Plan Area is focused along Shiloh Road. Healthcare represents the largest business sector, followed by construction, and retail trade. With a total of 289 businesses within the area and approximately 2,200 employees, many residents commute to other areas of Yellowstone County for work.

Transportation

Land within the Plan Area is accessed by a 135-mile street network in which small local access streets flow to larger collectors, which connect to a one-mile-by-one-mile arterial grid. Within the Plan Area, local access streets rarely connect from neighborhood to neighborhood or across arterials, which increases travel distances and requires most trips to include some travel on arterials. The southern boundary is defined by Interstate 90. Notable principal arterials include Rimrock Road, Grand Avenue, Central Ave, King Avenue W, Hesper Road, Neibauer Road, and Danford Road for east-west travel. The north-south travel arterials include 64th Street W, 62nd Street W, 56th Street W, 48th Street W, and Shiloh Road.

Existing pedestrian and bike infrastructure in West Billings is inconsistent and disconnected within the Plan Area. Sidewalks extend for a total of 64.5 miles within the Plan Area, yet only 32% of roads feature adjacent sidewalk infrastructure. In addition to sidewalks, there are 14.7 miles of paved multi-use trails in West Billings. There are currently no on-street bike lanes in the Plan Area.

Public transportation options in the West Billings area are notably limited, primarily confined to Shiloh Road, which delineates the eastern boundary of the Plan Area while also marking the westernmost extent of the bus network in Billings. Billings MET Transit provides services throughout the greater Billings area. Within the Plan Area, the North Westend and King Avenue West routes serve Shiloh Road and the immediate vicinity, with a small segment of the King Avenue West route extending just west of Shiloh Road to 44th Street W.

Shiloh Crossing - Sanbell

Between 2020 and 2024, there were a total of 239 reported crashes at intersections within the Plan Area, with crashes occurring primarily on Shiloh Rd, 48th St W, and 56th St W. Among these crashes, one incident was fatal at the intersection of 48th St W and King Ave in 2019, while four resulted in serious injuries.

Community Engagement

Throughout the planning process, community engagement has been critical to understanding issues within the Plan area. A complete summary of the public engagement process is provided in Appendix A. The following is a summary of the engagement conducted for the West Billings Plan.

Project Website

The project website was created in March 2024 to host project information, surveys, and other information critical to the project. It has hosted three (3) public surveys, an interactive webmap for the draft Future Land Use Map (FLUM), and provided project updates. The website also included contact information for key project team members.

Open House

In March 2024 a public open house was held to inform the public about the plan update and gather information about important issues.

This provided residents, interested community members, and City and County officials an opportunity to learn about and contribute to the plan development for West Billings. It offered a casual and interactive setting where attendees engaged with project materials, shared their perspectives, and interacted with the project team. Project team members engaged with attendees by using eleven informational boards dispersed around the room. The boards provided detailed information about what a neighborhood plan is, a contextual map of the area, the four major themes from the 2001 plan, land use and transportation, effects of transportation on land use and community character, transportation improvements map, and a next steps timeline for the project.

On August 14, 2025 the project team held an open house at Ben Steele Middle School. Before the meeting began, the project team distributed writing utensils and materials including a copy of the draft FLUM and future land use category descriptions. Attendees were encouraged to write comments on boards which displayed the Draft FLUM, guiding principles, and introductory information presented at the March 2024 open house. The project team gave a presentation introducing the project and recapping the work completed to that date, including the methods used to create the draft FLUM and next steps.

Future Land Use Workshops

In November 2024, the project team hosted two public future land use workshops. After a presentation on the planning process to-date and the rules of the future land use game, attendees made their own future land use maps collaboratively in groups of three to four.

Organization Presentations

Throughout the project, presentations were given to the Billings City Council, West End Neighborhood Task Force, West End Rotary Club, and the Billings Association of Realtors.

Open House March 2024 - Sanbell

Future Land Use Game November 2024 - Sanbell

CHAPTER TWO
BACKGROUND REPORT

Chapter Two Contents

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Introduction

Purpose

This Background Report is intended to inform the update to the 2001 West Billings Neighborhood Plan and the 2016 West End Multimodal Plan. It provides a snapshot of current (2024) conditions and trends in West Billings. It provides a detailed description of a wide variety of topics important to the community, such as demographics, housing, transportation, and land uses. The Background Report provides decision-makers, the public, and local agencies with context for the development of the Neighborhood Plan.

The overall approach to updating the Plans includes:

- Updating demographic and land use components
- Incorporating relevant components of City of Billings and Yellowstone County adopted plans and policies
- Review development and traffic data
- Summarize themes and issues identified during the first round of public involvement

Background Report Methods

This Background Report compiles essential data and findings from existing local planning documents and sources, providing a comprehensive review of the West Billings Neighborhood. The data draws from a range of reputable sources, including the US Census Data from 2020 and 2010, American Community Survey (ACS) data spanning 2017 to 2021, and Environmental Systems Research Institute (ESRI) data from 2023. By synthesizing these sources, the report offers a detailed understanding of demographic trends, housing dynamics, economic indicators, and other critical aspects of the plan area.

City and County Context

The “West End” of Billings is locally known as the area of town west of 24th St., south of the Rims, and north of I-90, with it’s western boundary moving ever further west with development. Growth in the area has accelerated in the last 30 years, driven, in large part by public investment in infrastructure like water, sewer, and transportation facilities.

The city’s boundary is a patchwork of annexed areas reflecting the incremental, uncoordinated history of development in the city and county. Development within the City has often “leap-frogged” over existing County developed areas, leaving islands of county land surrounded by incorporated areas.

The 2016 City of Billings Growth Policy acknowledges the importance of West Billings and the likelihood of continued growth of the area. That document identified a preferred development pattern focused on medium to high density residential, with commercial centers/nodes of development.

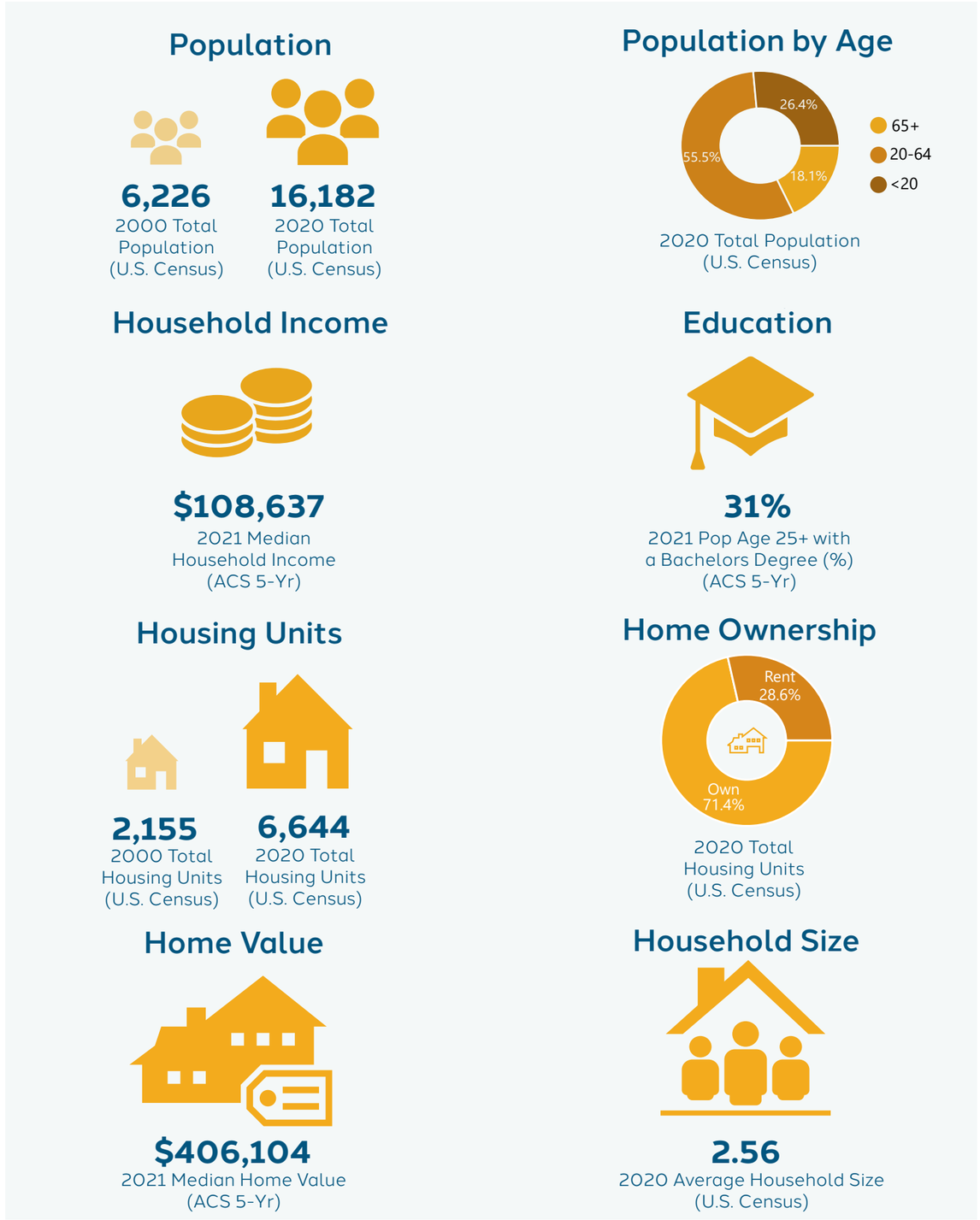

Figure 2.1 - Population and Household Statistics

Existing Conditions

Community Demographics

The West Billings Neighborhood has experienced substantial growth over the past two decades. According to census data, the population of West Billings surged from 6,226 in 2000 to 16,182 in 2020, a 160% growth rate. In comparison, Yellowstone County saw a growth rate of 27.35% during the same period, indicating the significant appeal of the neighborhood.

In terms of age distribution, the neighborhood has a diverse population with approximately 26.4% under the age of 20, 55.5% aged between 20 and 64, and 18.1% aged 65 and above. The plan area has a relatively small population of racial minorities, comprising just 11.5% of its residents. The median household income in West Billings is much higher than the county average, with a median of $108,637 compared to $65,656 for Yellowstone County. Education levels are relatively high, with 31.2% of the population aged 25 and above holding a bachelor's degree.These demographic characteristics are illustrated in Figure 2.1.

Housing

Over the past twenty years, residential land use in the West Billings plan area has developed to accommodate the area's rapid population growth. The total number of housing units increased 208%, from 2,155 in 2000 to 6,644 in 2020. Figure 2.2, shown to the right, illustrates the pattern and timing of residential development in the plan area based on year built. The majority of dwelling units are owner-occupied, accounting for 71.4% of the total, while renter-occupied units make up 28.6%. The average household size in the neighborhood is 2.56 persons. Home values in West Billings are 160% higher than the county average, with a median home value of $406,104 compared to $253,700 for Yellowstone County. Vacancy rates are relatively low at 5.4%, suggesting a high demand for housing in the plan area. According to the 2023 Billings Urban Area Long Range Transportation Plan, housing density within the Plan area is between 1-500 units per square mile, significantly lower than the older established neighborhoods of Billings. Those neighborhoods vary from 1,000 to 4,750 units per square mile.

Local Services and Facilities

West Billings is home to six schools, three public and three private institutions. These schools include Ben Steele Middle School (2017), Elder Grove Elementary School and Middle School (2020), Billings Christian School (1981), Billings Christian High School (2022), and Grace Montessori (2013). There are currently no libraries or formal community centers currently located in the plan area. Emergency services are provided by one City of Billings Fire station, Station 7 (2007), located off Grand Avenue on 54th Street West.

Development within the plan area is served by city water, sewer, and stormwater infrastructure within city limits and private wells and septic systems in the county. Figure 2.3 on page 22 shows the location of existing water and sewer infrastructure, as well as schools and fire services within the plan area.

Economic Development

As Montana's largest city and economy, Billings offers a wide array of economic opportunities. Top industries in Billings includes healthcare, retail trade, construction, wholesale trade, and educational services. These industries are all present in West Billings, with 263 businesses employing 1,988 individuals as of 2023. Employers in the area include Albertsons, Costco, First Interstate Bank, ExxonMobil, Intermountain Health, Cenex, and Town Pump. The Shiloh corridor hosts the largest

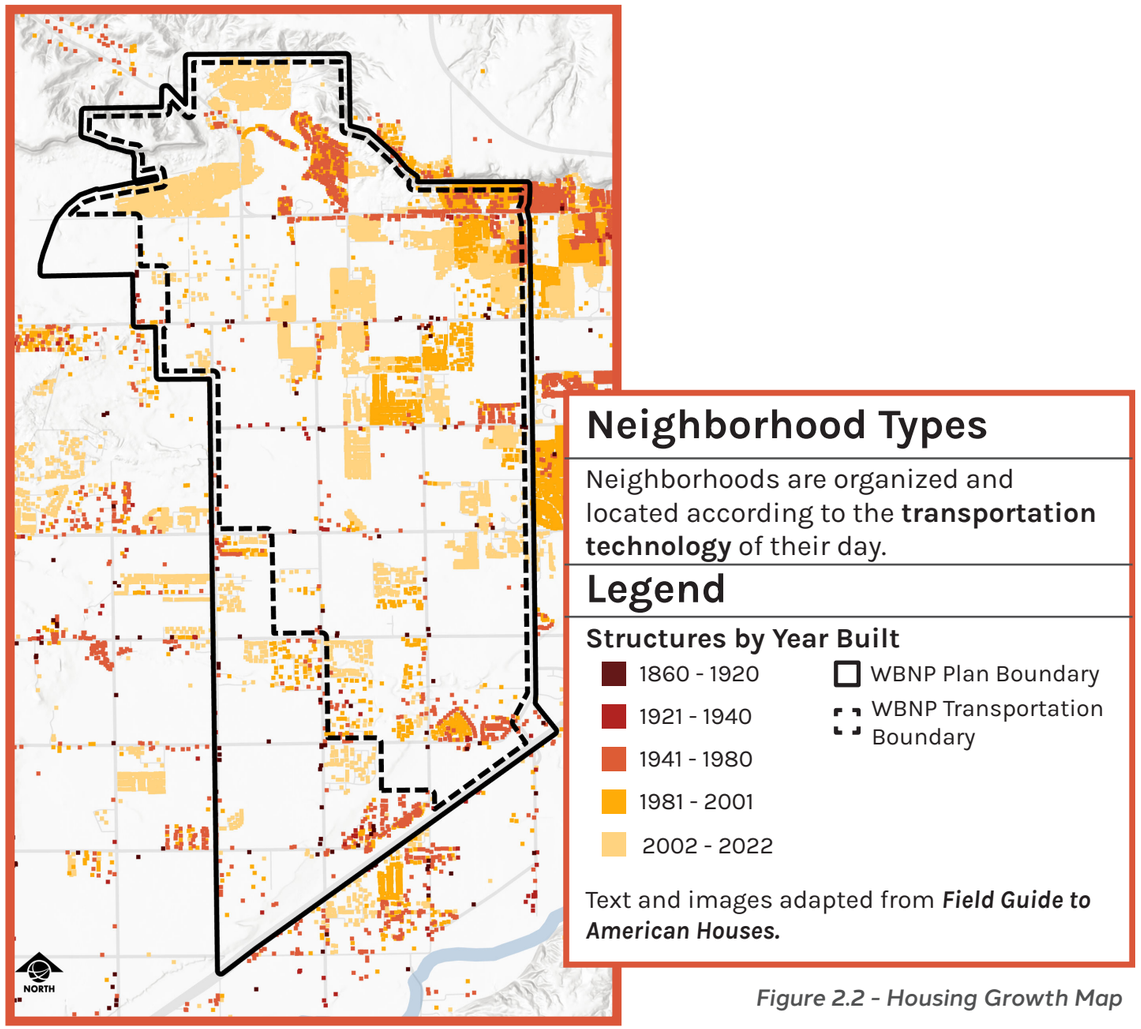

Figure 2.2 - Housing Growth Map

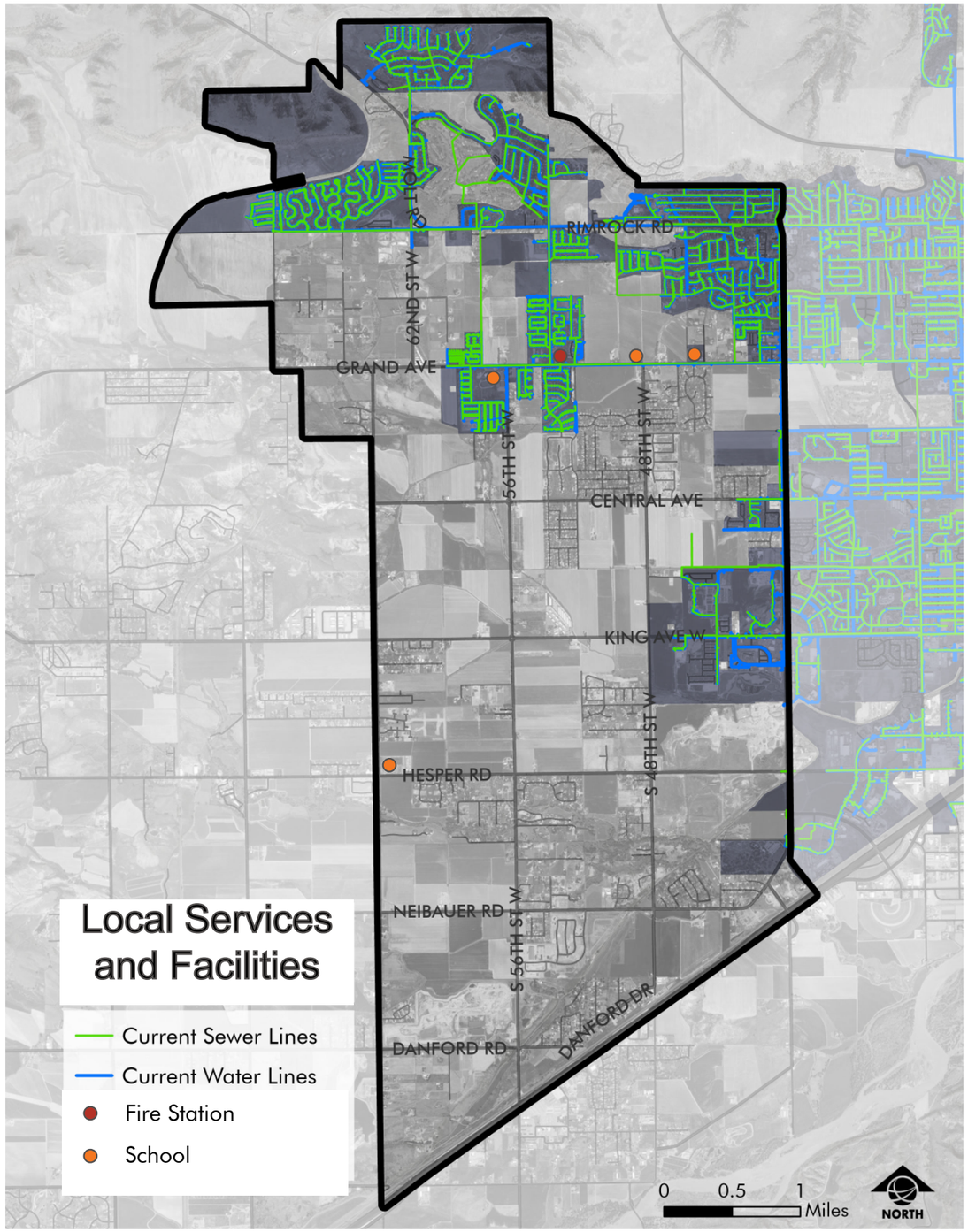

Figure 2.3 - Local Services Map

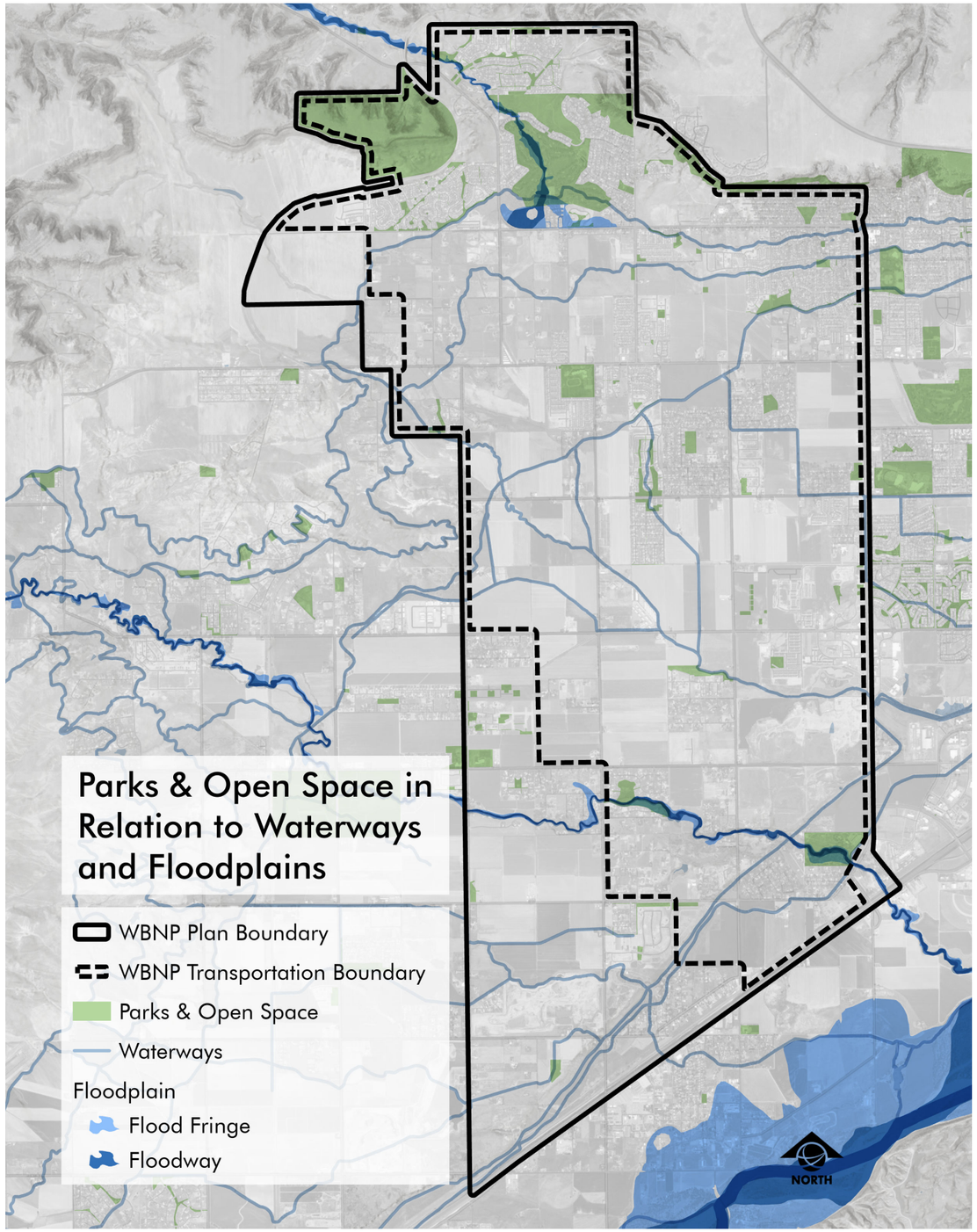

Figure 2.4 - Natural Environment Map

concentration of commercial activity, including retail uses, schools, and health care facilities. Additional development near the Zoo Drive interchange has increased the amount of retail square footage.

Land Use

Land use in the West Billings Plan Area has changed significantly since the adoption of the 2001 West Billings Plan. In 2003, agricultural use dominated the plan area, accounting for 56% of the land, while developed land comprised only 16%. In 2024, agricultural land use has decreased to 28% and developed land increasing to 36%. More specifically, in 2024, residential usage constitutes about 29% of total land use within the plan area, while commercial, mixed-use, and industrial uses make up about 2%, 2%, and 3% respectively.

Undeveloped land, excluding agriculture and public lands accounts for 20% of the total plan area, with about 3,000 acres remaining unused in the plan area as of 2024.

Natural Environment

The natural landscape of West Billings features several man-made and natural waterways, including Canyon Creek, Cove Creek, Big Ditch, High Ditch, Cove Ditch, Canyon Creek Ditch, and the BBWA Canal. 159 public parks provide area residents with access to 730 acres of wild and developed parklands for leisure and recreation.

The plan area also contains floodplains and about 160 acres of wetland, mostly along Canyon Creek, Cove Creek, and Hogan's Slough. These wetlands and riparian areas serve both as habitat for wildlife and as natural infrastructure, cleaning and absorbing water during floods and periods of high flow. Figure 2.4 on page 23 illustrates the location of parks and open space, waterways, and floodplain areas within the plan area.

Transportation

Land within the plan area is accessed by a 135-mile street network in which small local access streets flow to larger collectors, which connect to a one-mile-by-one-mile arterial grid. Within the Plan area, local access streets rarely connect from neighborhood to neighborhood or across arterials, which increases travel distances and requires most trips to include some travel on arterials. The southern boundary defined by Interstate 90. Notable principal arterials include Rimrock Road, Grand Avenue, Central Ave, King Avenue W, Hesper Road, Neibauer Road, and Danford Road for east-west travel, while 64th Street W, 62nd Street W, 56th Street W, 48th Street W, and Shiloh Road facilitate north-south travel.

Existing pedestrian and bike infrastructure in West Billings is inconsistent and disconnected within the Plan area. Sidewalks extend for a total of 64.5 miles within the plan area, yet only 32% of roads feature adjacent sidewalk infrastructure. In addition to sidewalks, there are 14.7 miles of paved multi-use trails in West Billings. There are currently no on-street bike lanes in the plan area.

Public transportation options in the West Billings area are notably limited, primarily confined to Shiloh Road, which delineates the eastern boundary of the plan area while also marking the westernmost extent of the bus network in Billings. Billings MET Transit provides services throughout the greater Billings area. Within the Plan area, the North Westend and King Avenue West routes serve Shiloh Road and the immediate vicinity, with a small segment of the King Avenue West route extending just west of Shiloh Road to 44th Street W. Between 2020 and 2024, there were a total of 239 reported crashes at intersections within the plan area, with crashes occurring primarily on Shiloh Rd, 48th St W, and 56th St W. Among these crashes, one incident was fatal at the intersection of 48th St W and King Ave in 2019, while four resulted in serious injuries. Figure 2.4 illustrates the existing street network, pedestrian and bicycle infrastructure, transit service, and planned transportation improvements within the plan area.

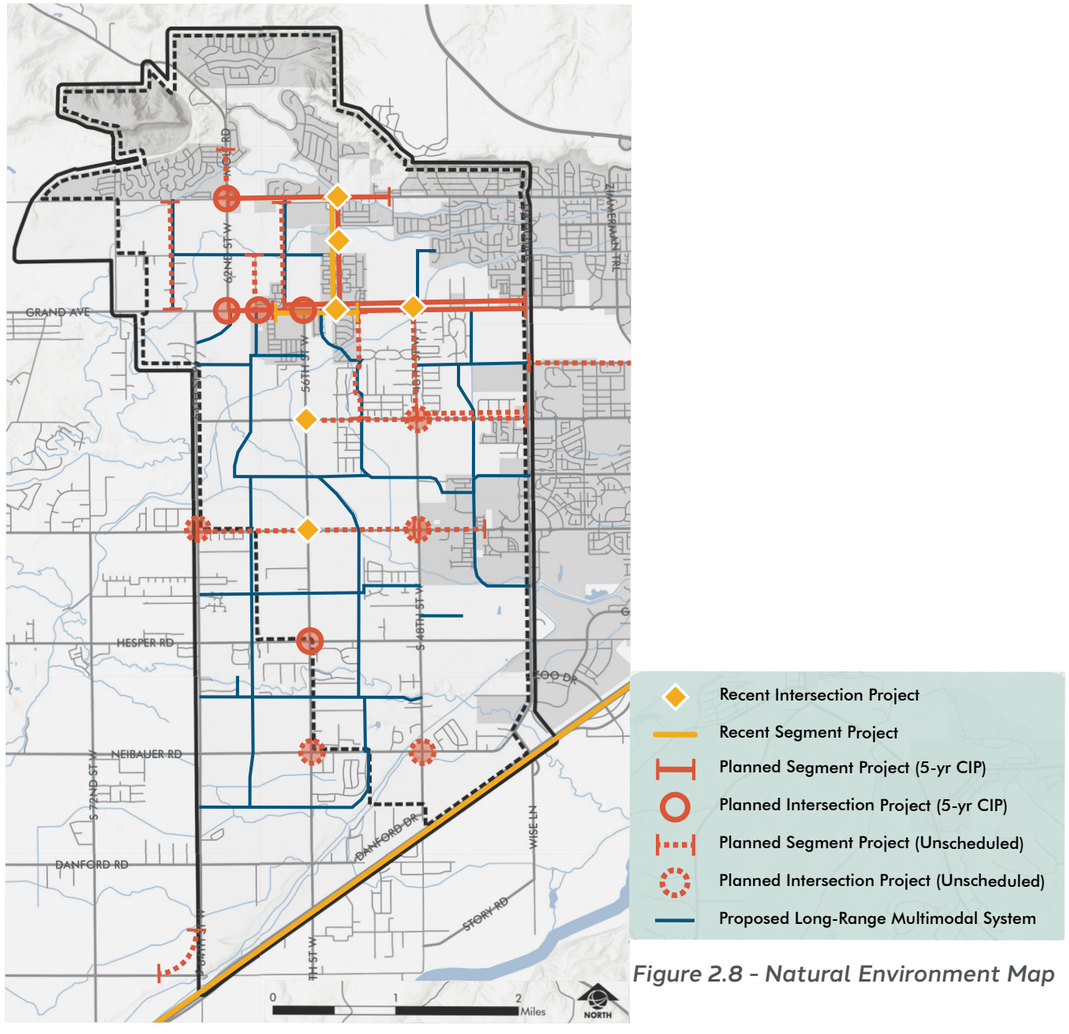

Figure 2.8 - Natural Environment Map

CHAPTER THREE
GUIDING PRINCIPLES

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Natural and Recreational Areas 32

Transportation Network 34

Guiding Principles Introduction

The West Billings Neighborhood Plan steering committee developed guiding principles to focus their work into four areas:

- Land Use
- Community Vitality
- Natural and Recreational Areas
- Transportation Network

This chapter outlines the Goals and Policies developed under those Guiding Principles, which are intended to steer development and planning activities going forward. These Goals and Policies reflect the results of community engagement, updating of the 2001 goals and policies, and existing conditions in the plan area.

GUIDING PRINCIPLES: Guiding principles are broad value statements that express the public vision for the future of the plan area. They are adaptations of the 2001 plan guiding principles.

GOALS: More specific than guiding principles, these statements identify a desired future state of the community. Goals are what this plan hopes to accomplish. they provide direction for decisions.

POLICIES: Policies are guidelines that help inform future policy

ACTIONS: Actions Implement the recommended policies. They are specific statements with a call to action to achieve the desired goals.

Land Use (LU)

Encourage a mix of residential, commercial, and employment uses that support the transition from rural to suburban to urban areas.

What we heard: Be thoughtful about development, connect transportation improvements with new development to ensure traffic impacts are minimized

- "Encourage unique small businesses"
- "Preserve our agricultural heritage"
- "Plan for areas that don't rely on private automobiles"
- "Need better coordination with the City, County and School District"

Housing

Goal LU – 1:

Grow responsibly by encouraging density and mixed-use development adjacent to existing infrastructure.

Policies:

- **Policy LU 1.1:** Use the Future Land Use Map to identify preferred growth areas.
  - **Action:** Adhere to minimum density standards specified by each land use category.
- **Policy LU 1.2:** Encourage infill development and new development adjacent to existing infrastructure.
  - **Action:** Review city infill and annexation policy for efficacy and revise if necessary.

Townhomes - Floberg Real Estate

- **Policy LU 1.3:** Zone land to accommodate projected population growth.
  - **Action:** Comply with the Montana Land Use Planning Act (MLUPA) by approving zone change requests that substantially comply with the Future Land Use Map (FLUM).

Goal LU – 2:

Plan for a variety of housing types at a variety of incomes.

Policies:

- **Policy LU 2.1:** Prioritize development of vibrant neighborhoods that offer a variety of housing types.
  - **Action:** Review Zoning to ensure Residential Zones allow for housing variation.

Goal LU – 3:

Identify transition areas between rural, suburban, and urban areas.

Policies:

- **Policy LU 3.1:** Develop a long-term plan for county subdivisions adjacent to city limits that would support annexation and connection to City services.
  - **Action:** Complete a MLUPA-compliant services study that includes analysis of providing service to county subdivisions in the event of water and sewer systems failure.
- **Policy LU 3.2:** Discourage leap-frog development to unincorporated areas where water and sewer services are unavailable. Leapfrog development occurs when development of new subdivisions occurs away from existing development and available. infrastructure.
  - **Action:** Review relevant city and county policy for efficacy in preventing leap-frog development.

Shiloh Commons - Google

Commercial Development

Goal LU-4:

Foster a pedestrian friendly environment for commercial areas

Policies:

- **Policy LU 4.1:** Coordinate sidewalk connectivity between commercial areas and adjacent residential neighborhoods.
    - **Action:** Review the city's master site plan review and regulatory requirement process for efficacy providing adequate pedestrian facilities in developments that do not go through subdivision.

Goal LU – 5:

Promote land uses that support Billings' key industries, encourage the diversification of the City's tax base, and enhance economic development through intentional infrastructure investments

Policies:

- **Policy LU 5.1:** Support development of Billings' and Yellowstone County's key industries: healthcare and health supply chain, retail trade, wholesale trade, tourism, hospitality, and professional services, as identified by Big Sky Economic Development and SB Friedman, an economic development consulting firm.
    - **Action:** Comply with MLUPA by reviewing the growth policy every five years for its efficacy in providing sufficient land for commercial development.

Agricultural Lands

Goal LU – 6:

Preserve agricultural lands in the County.

Policies:

- **Policy LU 6.1:** Identify key agricultural lands on the Future Land Use Map.
    - **Action:** Investigate adoption of county-wide zoning to preserve agricultural land uses and prevent creation of nuisance land uses adjacent to existing county residential.
- **Policy LU 6.2:** Encourage cluster subdivisions that conserve open space and agricultural lands.
    - **Action:** Consider changes to county subdivision regulations that will make cluster development more competative with typical county subdivisions.

Agriculture - MSU

Harvest Festival - KTVQ

Community Vitality (CV)

Create neighborhood centers/ nodes with integrated uses that are distinctive and contribute to increasing the community's vitality.

What we heard: Focus on improving safety, develop quality commercial areas that serve all residents

- "The more we focus on the development of family-friendly commercial and public land, the better for everyone."
- "Small commercial/retail businesses should be allowed in neighborhoods as opposed to pushing all commercial activity to major intersections."
- "Safety in everything is and should be the City's number one priority."

Activity Centers

Goal CV – 1:

Encourage the development of activity centers throughout the neighborhood

Policies:

- **Policy CV 1.1:** Identify and develop neighborhood centers/nodes within the community.
    - **Action:** Amend planned neighborhood development (PND), zoning, subdivision regulations and department policies to support and incentivize neighborhood-scale commercial.
    - **Action:** Include employment land uses in neighborhood centers to shorten commute times and reduce the impact of development on the transportation system.
- **Policy CV 1.2:** Strip commercial development is discouraged and should be prohibited through zoning regulations and city policy.
    - **Action:** Review existing regulations and policies for efficacy in reaching this goal.
- **Policy CV 1.3:** As appropriate in residential areas, neighborhood parks can be used as neighborhood centers/ nodes so long as certain amenities are provided.
    - **Action:** Work with the City Parks Department to develop a list of park amenities that would serve as a neighborhood center/ node. Possible examples include a community center or branch library at Cottonwood Park.

Mixed Use Development

Goal CV – 2:

Enhance the neighborhood by encouraging mixed-use developments

Policies:

- **Policy CV 2.1:** Encourage development of complete neighborhoods that integrate neighborhood centers/ nodes into the community.
    - **Action:** Amend PND, zoning, subdivision regulations and department policies to support and incentivize neighborhood-scale commercial.
- **Policy CV 2.2:** Create opportunities for mixed-use developments where supported by infrastructure.
    - **Action:** Survey local developers regarding barriers to mixed use development and multifamily residential development on commercially-zoned infill properties.

Billings PD - MFPE

Local Services and Facilities

Goal CV – 3:

Support public safety services and infrastructure to ensure that West Billings continues to be a safe, welcoming community that serves all residents.

- **Policy CV 3.1:** Improve community understanding of the cost to serve new developemnt in West Billings.
    - **Action:** Complete a MLUPA-compliant services study to ensure fiscal sustainability of providing services to new development on the West End.
    - **Action:** Complete a site selection analysis and cost feasibility study for constructing additional additional fire and police stations in the plan area.

Natural and Recreational Areas (NR)

Build a safe, healthy, and adaptable community that provides quality parks and green spaces while protecting floodways and natural areas.

What we heard: Build a well-connected, planned network of trails, multi-use paths, parks and natural spaces that are easily accessible by all West End residents.

- “Trails linking the shops to neighborhoods”
- “A large park, like Pioneer Park, west of Shiloh.”
- “Although Phipps is fantastic, this large section of Billings needs more public gathering spaces. Development of Cottonwood park or other natural areas would add to the character of the community.”
- “The development of new trails has been wonderful! It is one of the things that we love about Billings. We don’t have the best trail system in Montana, but it is improving all the time.”

Natural Resources

Goal NR – 1:

Preserve and protect floodways, waterways, and scenic resources.

Policies:

- **Policy NR 1.1:** Identify and preserve natural areas by limiting development within these areas.
    - **Action:** Explore potential for limiting development in rock fall hazard areas and popular recreational areas along the rims.
    - **Action:** Follow FEMA FIRM panels and agency regulations.

The Back Nine - MTB Project

Water Conservation

Goal NR – 2:

Encourage water conservation to manage water resources.

Policies:

- **Policy NR 2.1:** Encourage water conservation through development of landscape irrigation standards and best practices.
    - **Action:** Engage the City’s Energy and Conservation Commission to review existing landscape irrigation standards against the recently updated standards of other jurisdictions for potential changes.
- **Policy NR 2.2:** Align review of the future land use map with the City of Billings Water Master Plan to ensure that projected growth can be served with municipal water supplies.
    - **Action:** Analyze natural resources, environment and hazards in the Billings 2045 plan as they apply to the West Billings Plan area.

Parks and Trails

Goal NR – 3:

Connect neighborhoods with interconnecting parks and trails.

Policies:

- **Policy NR 3.1:** Create a linked network of green spaces

Trails - Billings Gazette

- **Action:** Continue to review development applications for compliance with the 2023 LRTP.

- **Policy NR 3.2:** Support ongoing individual park and citywide park master planning including updating the 2017 City Park Master Plan, and addressing maintenance costs.
  - **Action:** Complete a MLUPA-compliant services study to determine what kind of development will support the level of park service desired by area residents.

Transportation Network (TR)

Create a balanced and connected transportation network that supports multiple modes of travel while supporting the daily needs of residents.

What we heard: Coordinate transportation improvements with new development, prioritize safety for pedestrians, particularly children walking to school, increase the amount of protected bikeways and walking trails. Discourage speeding and reduce speed limits to improve safety

- "The focus needs to be on the communities being built and making it easier to walk, bike and roll around."
- "West Billings needs to focus on the expansion of roadways and traffic control. Main corridors should have speed reduced, additional traffic control and turn lanes."
- "Anything that can be done to make Billings less of the personal car-dependent city it is now would be great."
- "The City must develop a safer and more pedestrian-friendly transportation plan"

Multi-Modal Development

Goal TR – 1:

Provide a complete pedestrian transport network

Policies:

- **Policy TR 1.1:** Continue to require pedestrian infrastructure with all new developments
  - **Action:** Review the city's master site plan review process for efficacy providing adequate pedestrian facilities in developments that do not go through subdivision.
- **Policy TR 1.2:** Increase active transportation mode share for school-age children.
  - **Action:** Implement the recommendations of the Safe Routes to School Plans, Phase 1 and 2.
- **Policy TR 1.3:** Identify trail corridors and networks that can supplement the pedestrian network, help connect neighborhoods to schools, parks, and future transit access.
  - **Action:** Implement the trail-related recommendations of the 2023 Long Range Transportation Plan (LRTP) and the 2017 Billings Area Bikeway + Trails Master Plan Update.

Goal TR – 2:

Encourage development of bicycle infrastructure

- **Policy TR 2.1:** Continue to build out the network of bicycle facilities.
  - **Action:** Continue to implement and update the recommendations from the 2017 Billings Area Bikeway + Trails Master Plan Update.

Street Network

Goal TR – 3:

Provide an interconnected street network

Traffic and growth-related pressures were identified as top concerns expressed throughout the public engagement as part of this Plan Update,

Policies:

- **Policy TR 3.1:** Require connection of new developments with adjacent developments and vacant or agricultural land that will be developed in the future.
  - **Action:** Enforce requirements of Subdivision Regulations.
- **Policy TR 3.2:** Develop strategies to mitigate traffic congestion during peak periods
  - **Action:** Implement street network improvements in alignment with the 2023 Long Range Transportation Plan (LRTP).

MET Transit - KTVQ

Transit Development

Goal TR-4:

Encourage development at densities that support transit

Policies:

- **Policy TR 4.1:** Seek opportunities to expand transit service to and within West Billings over time
  - **Action:** Adhere to minimum density standards specified by each land use category to ensure that urban development supports transit service.

CHAPTER FOUR
FUTURE LAND USE

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Introduction

The Montana Land Use Planning Act (MLUPA) of 2023 generally requires Montana cities to coordinate and streamline planning and development review processes. MLUPA also requires cities to create and adopt a Future Land Use Map (FLUM). The Future Land Use Map places Future Land Use Categories throughout the plan area to formalize the public's vision for their community's future, create a useful tool for decision-makers in guiding development, and for landowners as they plan private investment.

The FLUM does not change existing zoning and becomes relevant only when considering a change from existing zoning.

Legal Requirements of the Future Land Use Map

The Montana Land Use Planning Act (MLUPA) of 2023 sets specific requirements for cities as to how they plan for future growth. This includes projection of future population growth and housing demand among other considerations. The details of this Plan's compliance with MLUPA can be found in Chapter 7.

Future Land Use Categories

The FLUM becomes relevant to a landowner when they decide to change their property's zoning. At that time, the landowner can reference the FLUM to find what Future Land Use Category their property is in. That Category provides a "menu" of zones they can change to through the administrative process created under MLUPA. The landowner may also choose a zone outside of their property's Category by going through the same public application process that existed before the passage of MLUPA.

The following pages illustrate the different land use categories.

Rural Residential/Agricultural (RRA)

Productive Ag Land - City Staff

Rural Residential - City Staff

Summary:

Agricultural production lands and rural residential uses on lots larger than one acre that include agricultural uses and may conserve the agricultural heritage of the Yellowstone Valley. Due to the low-density nature of development, public water and wastewater utilities are generally not available. These districts are not in the City Limits.

Primary Land Uses:

Agriculture / Rural Residential

Building Types:

Single-Family and Duplex Dwellings / Manufactured Homes / Accessory Dwellings Units

Density:

Max 1 unit per acre (accessory dwelling units are not primary units)

Mobility & Street Network:

The street grid is more spread out, typically following section lines with private vehicles as the primary mode of transportation. Local streets are generally gravel.

County Neighborhoods (CN)

Black Rock Estates - Google

Cloverleaf Meadows - Google

Summary:

Large lot rural neighborhoods not developed in the city with limited access to public water and wastewater utility systems.

Primary Land Uses:

Suburban Residential

Building Types:

Single-Family and Duplex Dwellings / Manufactured Homes / Accessory Dwellings Units

Density:

0.33 - 2.99 units per acre (accessory dwelling units are not primary units)

Mobility & Street Network:

Neighborhood streets connected to collectors or arterials, some of which may be paved. Future county neighborhoods should be connected to existing neighborhoods.

Suburban Residential (SR)

Yellowstone Country Club - Google

Vintage Estates - Google

Summary:

Existing single family residential with structures of similar setback and maximum heights with access to public water and sewer.

Primary Land Uses:

Suburban Residential

Building Types:

Single-Family / Accessory Dwellings Units

Density:

4 - 7 units per acre (accessory dwelling units are not primary units)

Mobility & Street Network:

Paved neighborhood streets connected to collectors or arterials. These neighborhoods may have access to nearby community ammenities including parks, schools, and neighborhood commercial areas.

Urban Residential Limited (URL)

Country Club Estates - Google

Ironwood- Google

Summary:

Suburban residential with structures of similar setback and maximum heights, with access to public water and sewer.

Primary Land Uses:

Suburban Residential

Building Types:

Single-Family and Duplex Dwellings / Accessory Dwellings Units

Density:

3.5 - 7 units per acre (accessory dwelling units are not primary units)

Mobility & Street Network:

Paved neighborhood streets connected to collectors or arterials. Future neighborhoods should be connected to existing neighborhoods. These neighborhoods may have access to nearby community ammenities including parks, schools, and neighborhood commercial areas.

Urban Residential (UR)

Trails West - Google

Josephine Crossing - Google

Summary:

Mixed density neighborhoods including some neighborhood commercial and housing choices from single family to townhome (4 units/structure). Public water and sewer is provided.

Primary Land Uses:

Residential / Neighborhood Services / Small Offices

Building Types:

Single-Family to Four-Family Dwellings / Accessory Dwellings Units / Neighborhood Services

Density:

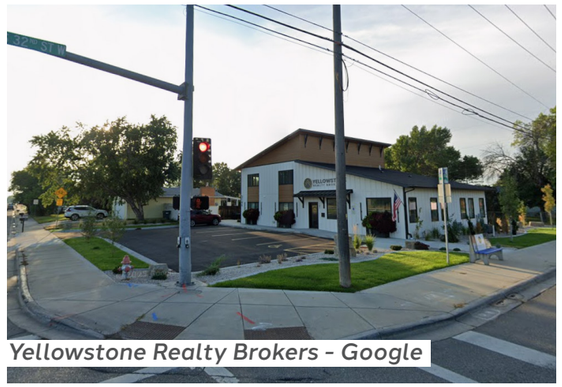
6 - 16 units per acre (accessory dwelling units are not primary units)

Mobility & Street Network:

Development is organized to support a walkable environment. Streets have adjacent sidewalks and shared use pathways to connect neighborhoods to community amenities and nearby commercial areas.

Urban Residential Mixed (URM)

Legacy Homes - Google



Yellowstone Realty Brokers - Google

Summary:

Higher density is adjacent to mixed use with corridor services such as smaller retail businesses. Highly walkable neighborhood with possible service from transit. Development should focus on active uses and providing a safe and comfortable environment for people, both residents and visitors.

Primary Land Uses:

Residential / Commercial / Offices / Public Spaces

Building Types:

Single-Family to Eight-Family Dwellings / Accessory Dwelling Units / Commercial Mixed-Use / Offices / Retail

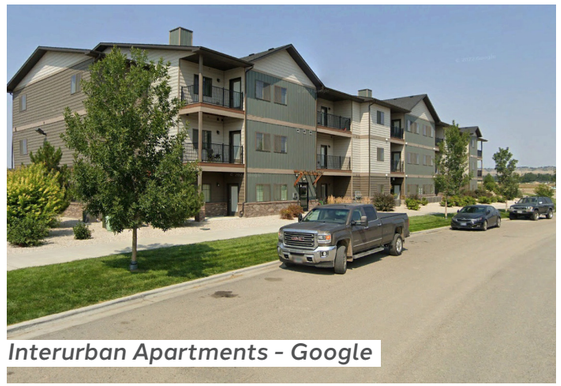
Density:

12 - 24 units per acre (accessory dwelling units are not primary units)

Mobility & Street Network:

Development is organized to support a walkable environment. Streets have adjacent sidewalks and shared use pathways to connect community amenities and commercial areas with walkable blocks.

Urban Node (UN)



Interurban Apartments - Google

Shiloh Commons - Google

Summary:

Higher-intensity, larger-scale places where destinations like shopping and services are walkable but primarily accessed by vehicles.

Primary Land Uses:

High-Density Residential / Commercial / Mixed-Use / Shopping Centers / Public Spaces / Offices

Building Types:

Apartments / Townhomes / Multi-Tenant Retail / Offices / Commercial with or without Drive-Through Services

Density:

16+ units per acre

Mobility & Street Network:

Arterials, collectors, local commercial streets supported by transit that are adjacent to sidewalks and shared use pathways.

Commercial Mixed (CM)

Commercial Uses - Google

Heavy Commercial Use - Google

Summary:

Standalone commercial areas either in the city or county sometimes with adjacent higher-density residential. Could include areas in the county for contractor shops, storage, warehousing, sometimes adjacent to Urban Nodes or Urban Residential Mixed.

Primary Land Uses:

Higher-Intensity Commercial Uses / High-Density Residential

Building Types:

Higher-Intensity Commercial Uses / High-Density Residential

Density:

16+ units per acre

Mobility & Street Network:

Arterials, collectors, and local commercial streets.

Downtown Urban (DU)

Downtown Billings - Google

Minnesota Ave. - Google

Summary:

High density residential, multi-tenant and multi-story buildings, buildings are built to the street, onsite parking may or may not be provided. Designed to be highly walkable.

Primary Land Uses:

High-Density Residential / Multi-Story Offices / Retail / Historic Buildings / Public Spaces

Building Types:

Multi-Story Buildings / Buildings are Built to the Street Front with or without Off-Street Parking

Density:

16+ units per acre

Mobility & Street Network:

Local streets that are adjacent to wider sidewalks that accommodate commercial activities and larger volumes of people.

Employment and Industrial (EI)

Pacific Supply - Google

Johnstone Supply - Google

Summary:

Areas of employment that provide a range of jobs in sectors such as production, manufacturing, research, distribution or extraction which may be incompatible with residential uses.

Primary Land Uses:

Warehousing / Hotels / Larger-Scale Buildings Providing Employment

Building Types:

Multi-Story or Multi-Acre Structures to Accommodate Employment

Density:

Residential units are unlikely in these areas, but are allowed in Heavy Commercial Areas.

Mobility & Street Network:

Sites are well connected to the arterial and collector street network and provide connections to interstate transportation networks (air, train, highway, etc.).

Open Space (OS)

Phipps Park - Google

Shiloh Conservation Area - Google

Summary:

Regional public parks, recreation areas, and natural or sensitive areas which provide a variety of recreational opportunities.

Primary Land Uses:

Regional and Neighborhood Recreational Facilities / Passive and Active Open Spaces

Building Types:

Facilities Associated with Public Use and Recreation

Density:

N/A

Mobility & Street Network:

Parks and recreation sites will be well connected to adjacent neighborhoods.

Public Institution (PI)

Ben Steele Middle School - Google

King of Glory Church - Google

Summary:

Public, civic, and institutional uses located within or on the edge of neighborhoods.

Primary Land Uses:

Schools / Churches / Hospitals / Public Facilities (Non-Recreational)

Building Types:

A Variety of Building Types Varying in Nature of Use and Sizing

Density:

Density associated with insitutional use.

Mobility & Street Network:

Typically located on collectors or arterials. Occassionally located within neighborhoods.

Alignment with Zoning

Future Land Use Categories incorporate existing city and county zoning by grouping together zones of similar scale, use, and intensity. In keeping with the Planned Neighborhood Development (PND) provisions of city zoning regulation, categories include a requirement that a development's average gross density falls within a specified range. This both allows for the mix of zones that the PND requires and ensures that developments meet the intent of the category and FLUM. Each category is described in terms of its primary zones, character, target densities for residential uses, building types, mobility network, open spaces, and performance metrics.

Future Land Use Map (FLUM)

The Montana Land Use Planning Act (MLUPA) requires that cities adopt a Future Land Use Map (FLUM), something Billings has never done before. To answer the question of how West Billings should grow over the next 20 years, the project team reviewed existing plan documents and undertook a public engagement process seeking the community's vision for the future of the plan area, which was used to update the themes of the 2001 West Billings Plan. A suitability analysis (described in Appendix B) of geographic factors known to drive development was also completed to inform the FLUM. This information was then used to create a map of future land uses, illustrated in Figure 4.1 to the following page, that accommodates anticipated population growth and housing demand, among other elements, over the next 20 years.

Statement of Intent

The future land use map gives Billings and Yellowstone County guidance as to what land is likely to develop first, what land has better access and supports more intense uses, and what land will be more cost effective to serve with municipal services like police, water and sewer.

Billings and Yellowstone County zoning and subdivision regulations have both been recently updated; zoning in 2021, and subdivision regulations in 2024. This plan is intended to comply with and reflect those updates as well as other local regulations like the limits of annexation policy and map. The future land use map developed as part of the overall Billings 2045 Plan will incorporate this map and also follow with existing local land use regulations.

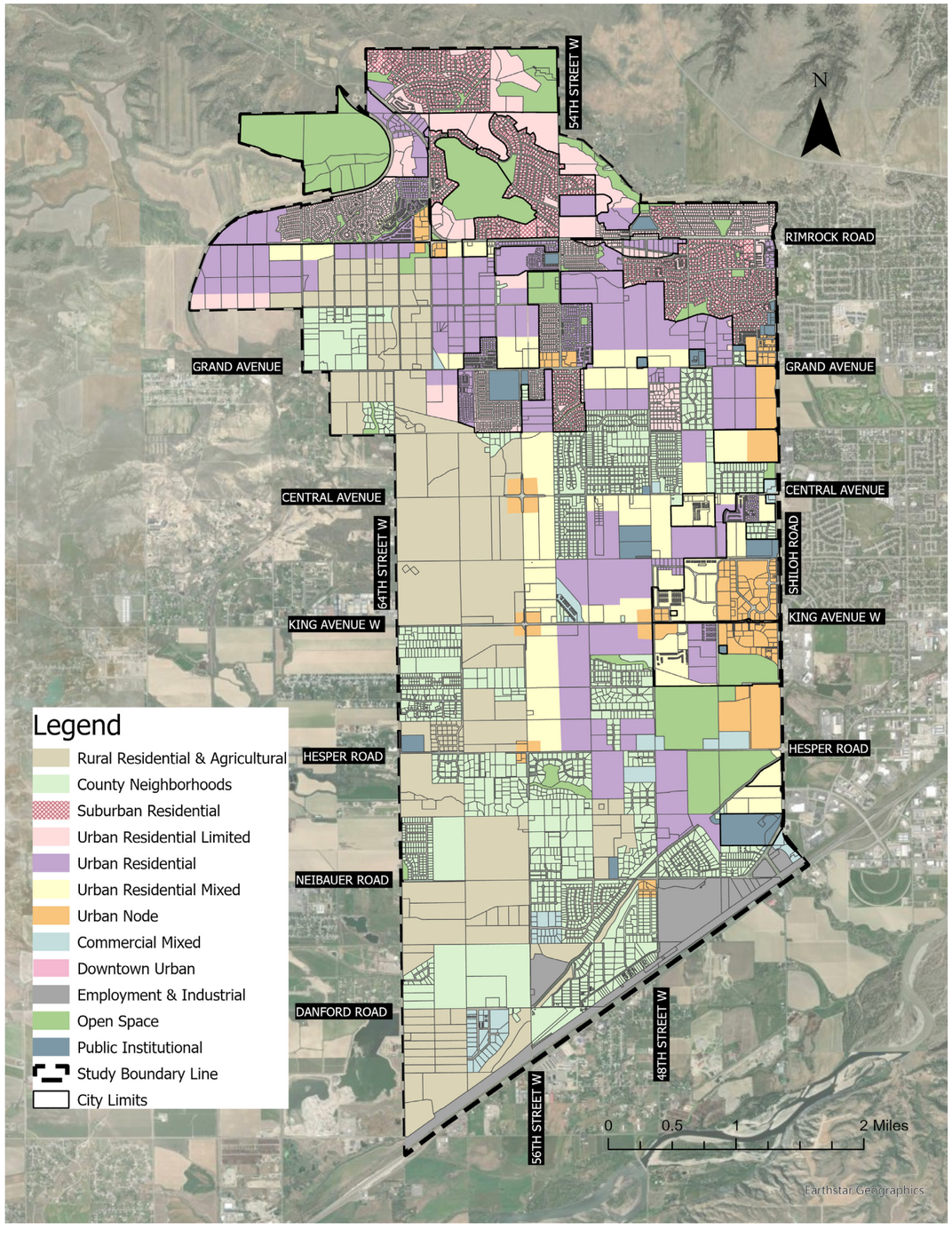


Figure 4.1 Future Land Use Map

Montana Land Use Planning Act Compliance

The Montana Land Use Planning Act (MLUPA) places many requirements on this plan, known as a Future Land Use Plan, and the Future Land Use Map (FLUM) it creates. Details of all aspects of this plan's MLUPA compliance are provided in Chapter 7. Aspects of the FLUM's compliance with MLUPA which have not already been addressed in this chapter are provided here.

Population Projections

Montana Code Annotated (MCA) Section 76-25-213 (4) requires that the FLUM identify the following:

(c) geographic distribution of future land uses in the jurisdiction, anticipated over a 20-year planning period that specifically demonstrate:

i) adequate land to support the projected population in all land use types in areas where local services can be adequately and cost-effectively provided for that population;

Historically, public investment in utility and transportation facilities combined with ample supply of developable land has driven rapid population growth in West Billings as compared to other areas of Yellowstone County. From 2000 to 2020, a total of 4,490 housing units were constructed in the plan area. This accounts for approximately 30 percent of all housing units constructed within Yellowstone County during that period. Population projections for this plan assumed that the West Billings plan area would continue to receive a similar share of county population growth over the next 20 years.

Consistent with the Montana Land Use Planning Act, population projections were estimated over the next 20 years (2045) based on data resources including the Billings Long Range Transportation Plan (LRTP), the US Census, and the Montana Department of Commerce Regional Economic Models Inc (REMI). For consistency among planning documents, data from the LRTP was used to create projections within the West Billings plan area. Below are the growth projections for the plan area.

Commercial Land Use Demand Projection

In order to meet the project guiding principles informed by the project's public input, the project team included varying scales of commercial zones in several future land use categories. Categories that allow commercial zones include; Urban Residential (UR), Urban Residential Mixed (URM), Urban Node (UN), Commercial Mixed (CM), and Employment and Industrial (EI).

The most current available data from Yellowstone County indicates that 760 acres within the plan area are under commercial use. Applying a compound annual growth rate similar to the plan area's projected population growth yields a projected demand of 1,400 acres. The FLUM provides 4,076 acres of future land use categories that allow commercial use.

Residential Land Use Demand Projection

Montana Code Annotated (MCA) Section 76-25-213 (4)(c) requires that the FLUM identify the following:

(ii) adequate sites to accommodate the type and supply of housing needed for the projected population; and

After performing an analysis of existing housing stock including factors like year built and residential density the project team cross referenced the plan area's population growth projections, as shown in Table 4.1 below, average houshold size, and percent of Yellowstone County residents who experience housing burden to determine the 20-year projected housing demand and percent of that projected demand which will need to be affordable to Billings area residents.

Because 29% of Yellowstone County residents experience housing burden, the project team determined that, to meet the above MLUPA requirement, 29% of the projected housing demand should be met by providing land in the FLUM categorized to provide "missing middle" housing, which tends to be more affordable than lower-density, typically single-family zones or higher-density apartment buildings. FLUM categories considered likely to provide missing middle housing include Urban Residential (UR) and Urban Residential Mixed (URM). To determine the area required to meet projected residential land use demand, the project team analyzed existing development in the plan area according to their zoning and the resulting residential density.

Population Projections				
	2000	**2021**	**2045 Projected**	**2020-2045 Change**
Study Area	**6,226**	**16,182**	**30,770**	**14,588**
MPO Planning Area	112092	142,358	190,986	48,628
Housing Needs				
	2000	**2021**	**2045 Projected**	**2020-2045 Change**
Study Area	**2,155**	**6,644**	**13,444**	**6,800**
MPO Planning Area		58,815	78,814	20,000
*Assumes a 30% capture rate of population growth and new housing units				

Table 4.1 Population Projections

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CHAPTER FIVE
MULTIMODAL PLAN UPDATE

Chapter Five Contents

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Introduction

The Billings Metropolitan Planning Organization (MPO) is responsible for coordinating federally required transportation planning for the urbanized area of Billings, ensuring that roadway, transit, bicycle, and pedestrian needs are addressed through a cooperative, continuing, and comprehensive planning process. As part of this effort, understanding growth trends and their effects on the transportation network is essential.

Billings is the largest municipality in Montana, with a 2024 population estimate of 121,483 according to the U.S. Census Bureau. The Billings MPO 2023 Long Range Transportation Plan (LRTP) projected that West Billings alone could grow by more than 13,000 residents by 2045. This area includes property within the city limits and outside the city limits. The updated Future Land Use Map (FLUM), discussed in previous chapters, illustrates how this growth is anticipated to occur.

As West Billings expands, traffic volumes will increase and demand for pedestrian and bicycle facilities will intensify. These changes will directly affect the safety and operation of vehicular, bicycle, and pedestrian systems throughout the area.

This chapter provides an update to the 2016 West End Multi-Modal Plan and offers multimodal transportation recommendations to support the safety, efficiency, and overall functionality of the West Billings transportation network.

This will include:

1. Analysis of existing vehicle and active transportation conditions within the study area;
2. Estimated future trip generation for West Billings based on projected growth and the updated FLUM;
3. A review of planned and committed transportation projects within the study area;
4. Identification of future deficiencies in vehicular and active transportation facilities based on the anticipated buildout of the area;
5. Evaluation of potential mitigation strategies to address these deficiencies; and
6. Recommendations to the City of Billings and Yellowstone County to resolve identified issues.

Existing Conditions

While the primary purpose of this study is to identify and prioritize potential project needs over a 20-year horizon, evaluating existing conditions is essential to establish a clear baseline for understanding future growth and demand. The following sections summarize Sanbell's assessment of current operational and safety conditions for all modes of travel.

Streets & Intersections

The following paragraphs present background information on the major streets and intersections within the study area. These descriptions include physical characteristics, speed limits, traffic control features, and roadway classifications, all of which help explain traffic demand and the composition of traffic using these facilities.

Streets

A series of streets transects this area of Billings and Yellowstone County, generally laid out on a standard north-south-east-west grid. Those streets have a variety of roles, typically defined by their Functional Classifications, in the transportation of people and goods throughout the area. Functional Classification is the process by which streets and highways are grouped into classes according to the character of the traffic service that they are intended to provide. The basic system generally includes three categories: 1.) Arterials; 2.) Collectors; and 3.) Local Streets. Arterials are intended to provide a high level of mobility with limited local access. At the other end of the spectrum, Local Streets are designed to focus on providing access with limited regional mobility. Collectors typically fall somewhere in the middle, aiming at a balance between mobility and access.

Most jurisdictions further expand upon this system by adding Major (Principal) and Minor designations to the Arterial and sometimes Collector categories. Interstate is also often a separate classification category. The MPO utilizes the designations of Interstate, Principal Arterial, Minor Arterial, Collector, and Local Street to define streets and highways in the urbanized area of Yellowstone County. The Montana Department of Transportation (MDT) uses the categories of Interstate Principal Arterial, Other Principal Arterial, Minor Arterial, Major Collector, Minor Collector, Local, and Alley to classify roadways. Table 5.1 lists all non-local streets within the study area, with functional classifications provided based on both systems where applicable.

Yellowstone County Ordinance 07-107 establishes restrictions on truck traffic along designated County roads. The ordinance prohibits trucks—defined as vehicles with a combined gross vehicle weight of 16,000 pounds or more—from using restricted roads except when making local deliveries. Businesses located on restricted roads must route trucks along the shortest path to an unrestricted roadway. Within the West Billings Neighborhood Plan study area, most arterial streets are restricted, with the exceptions of Rimrock Road, Grand Avenue, King Avenue West, 56th Street West, and a portion of 64th St. W. Table 5.1 identifies these restrictions for each roadway.

With respect to the physical environment, roadway width (including lane and shoulder widths) and vehicle speeds are the two most significant factors influencing multimodal mobility in the study area. The Project Team inventoried these characteristics, and the results are summarized in Table 5.1. As shown, most street segments within the study area have posted speed limits of 45 mph or higher. When paired with narrow travel lanes and shoulders, these higher speeds create conditions that are generally uninviting—and often uncomfortable—for pedestrians and bicyclists.

Table 5.1: Study Area Arterial and Collector Street Characteristics

Street	Functional Classification		Truck Traffic Restriction	Typical Street Widths (ft)		Speed Limit (mph)
	MPO	MDT		Travel Lanes	Shoulders	
Rimrock Road	Principal Arterial/Collector[1]	Minor Arterial/Local[2]	Unrestricted	11.0 - 11.5	0.5 - 2.5	55 / 45[8]
Grand Avenue	Principal Arterial	Minor Collector/Major Collector[3]	Unrestricted	11.0 - 12.0	1.0 - 7.0	50 / 45 / 35[9]
Central Avenue	Principal Arterial	Minor Collector/Major Collector[4]	Restricted	11.0	0.5 - 1.0	50 / 45[10]
King Avenue	Principal Arterial	Major Collector	Unrestricted	11.5 - 12.0	0.5 - 1.0	60
Hesper Road	Principal Arterial	Local	Restricted	11.0	0.5 - 1.0	50 / 45 / 35 / 15[11]
Neibauer Road	Principal Arterial	Minor Collector/Major Collector[5]	Restricted	10.5 - 11.5	0.5 - 1.0	50 / 45[12]
64th Street West	Principal Arterial	Minor Collector/Local[6]	Unrestricted/Restricted[7]	10.5 - 11.0	1.0 - 2.5	50 / 35 / 15[13]
62nd Street West	Principal Arterial	Major Collector	Restricted	10.5 - 11.0	0.5 - 1.0	45
56th Street West	Principal Arterial	Minor Collector	Unrestricted	11.0	0.5 - 1.0	35 / 50[13]
54th Street West	Minor Arterial	Local	Unrestricted	11.0	0.5 - 1.0	45
48th Street West	Principal Arterial	Local	Restricted	10.0 - 11.0	0.5 - 1.0	35 / 45 / 50[14]
46th Street West	Collector	Local	Unrestricted	18.0	0.5 - 1.0	30

[1] Principal Arterial - 46th Street West to 62nd Street West / Collector - 62nd Street West to 70th Street West

[2] Minor Arterial - 46th Street West to 62nd Street West / Local - 62nd Street West to 70th Street West

[3] Major Collector - 48th Street West to 62nd Street West / Minor Collector - 62nd Street West to 64th Street West

[4] Major Collector - 48th Street West to 32nd Street West / Minor Collector - 32nd Street West to 64th Street West

[5] Major Collector - Autumn Lane to 48th Street West / Minor Collector - 48th Street West to 56th Street West

[6] Minor Collector - Grand Avenue to King Avenue / Local - King Avenue to Neibauer Road

[7] Unrestricted - Grand Avenue to King Avenue / Restricted - King Avenue to Neibauer Road

[8] 55 mph - 70th Street West to 54th Street West / 45 mph - 54th Street West to 46th Street West

[9] 50 mph - west of 64th Street West / 45 mph - 64th Street West to Widerness Drive / 35 mph - Wilderness Drive to 48th Street West

[10] 50 mph - west of 48th Street West / 45 mph - east of 48th Street West

[11] 50 mph - west of South 68th Street West and from Arthur Avenue to 48th Street West / 45 mph - east of 48th Street West / 35 mph - from South 59th Street West to Arthur Avenue and from Cherry Birch Lane to South 68th Street West/ 15 mph from Arthur Avenue to Cherry Birch Lane

[12] 50 mph - 56th Street West to 48th Street West / 45 mph - 48th Street West to Autumn Lane

[13] 50 mph - south of Peace Pipe Drive and North of Amen Corner Lane / 35 mph - Peace Pipe Drive to Hesper Road and from Eler Grove School north parking lot acces to Amen Corner Lane / 15 mph - from Hesper Road to Eler Grove School north parking lot acces

[14] 35 mph - Grand Avenue to Broadwater Avenue / 50 mph - Broadwater Avenue to Neibauer Road

[15] 35 mph - Grand Avenue to Broadwater Avenue / 45 mph - Broadwater Avenue to Central Avenue / 50 mph - Central Avenue to Neibauer Road

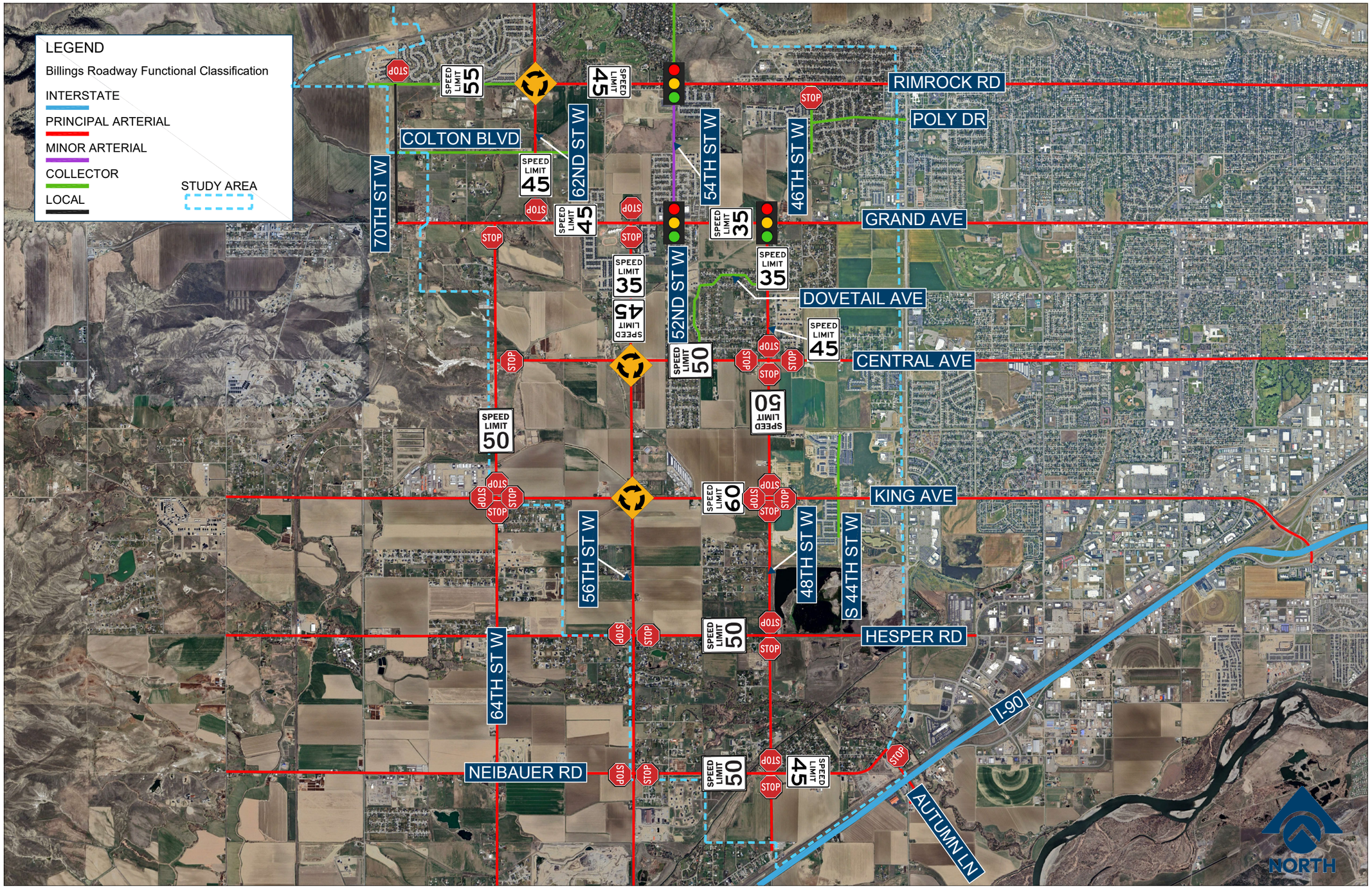

Figure 5.1 Streets and Intersection Characteristics

Figure 5.1 illustrates the City of Billings (MPO) street classifications, posted speed limits on study-area roadways, and the traffic control present at each study intersection.

Intersections

Twenty intersections within the study area were identified as key locations based on existing or anticipated traffic demand. These intersections are shown in Figure 5.2. The intersections in this review include:

- Central Avenue/56th Street West
- King Avenue West/56th Street West, and Rimrock Road/62nd Street West intersections currently operate as single-lane roundabouts
- Rimrock Road/54th Street West, Grand Avenue/54th Street West, and Grand Avenue/48th Street West intersections are signalized
- Central Avenue/48th Street West, King Avenue West/64th Street West, and King Avenue West/48th Street West intersections are controlled by all-way stop signs

The remaining study-area intersections are two-way stop-controlled, with several locations supplemented by overhead flashing beacons to alert high-speed drivers to approaching stop signs (red beacons) or to side-street stop control (amber beacons). Seasonal agricultural crop growth also limits sight distance at several intersections during certain times of the year.

Safety & Traffic

A comprehensive evaluation of existing traffic and safety conditions was completed to establish a baseline for analyzing future operating scenarios. This effort included reviewing historical traffic data from MDT and collecting new peak-hour turning-movement counts at key intersections.

Safety

The 2016 West End Multi-Modal Planning Study, completed by Sanderson Stewart and Fehr & Peers, identified seven intersections within the current study area that exhibited safety concerns at the time, based on intersections that had a crash rate greater than 1.0 crashes per million vehicles entering (MVE). These intersections included:

- Rimrock Road & 62nd Street West (excluding crashes occurring on the Molt Road curve)
- Central Avenue & 48th Street West
- Central Avenue & 56th Street West
- King Avenue & 56th Street West
- Hesper Road & 56th Street West
- Neibauer Road & 48th Street West
- Neibauer Road & 56th Street West

Of these seven locations, only two have not yet been improved or are not currently planned for near-term improvements . Safety at the Central Avenue/48th Street West intersection was enhanced by converting it to all-way stop control, and the intersection is now in design for a traffic signal and turn-lane project scheduled for construction in spring 2026. Single-lane roundabouts have been installed at Central Avenue/56th Street West, King Avenue/56th Street West, and Rimrock Road/62nd Street West. A single-lane roundabout has also been designed for the Hesper Road/56th Street West intersection but would require further right-of-way acquisition for construction.

The study further noted that the Neibauer Road/56th Street West and Neibauer Road/48th Street West intersections had some of the highest crash and severity rates. In this context, the severity index represents the weighted average of crash severity—accounting for fatal, injury, and property-damage-only crashes—while the severity rate is calculated by multiplying the crash rate by the severity index.

Updated crash data was obtained from MDT for the five-year period from 2020 through 2024 and crash rates were compared to the 2016 study. The new rates are shown in Table 5.2. The results show that several of the high crash rate locations noted above have seen reductions, likely due to the safety improvements described previously. Some of the above intersections have maintained crash rates greater than 1.0 crashes per MVE due to lack of improvements, and some new intersections are experiencing high crash rates that did not previously. The crash rate calculated at the Rimrock Road/62nd Street West intersection remains high, but the data does not reflect the impact of the recently completed roundabout.

Intersections with higher than 1.0 crashes/MVE in 2020 through 2024 include the following:

- Rimrock Road & 62nd Street West (excluding crashes occurring on the Molt Road curve)
- Hesper Road & 56th Street West
- Neibauer Road & 48th Street West
- Neibauer Road & 56th Street West
- Grand Avenue & 62nd Street West
- Central Avenue & 64th Street West
- King Avenue & 64th Street West
- King Avenue & 48th Street West
- Hesper Road & 48th Street West

The King Avenue/64th Street West intersection experienced the highest total number of crashes over the five-year period (30) and a crash rate of 2.00 crashes/MVE. Two-thirds of crashes resulted in injury at this intersection. A single lane roundabout is currently planned and is projected to improve safety by addressing both the high volume and high severity of crashes.

The Neibauer Road/56th Street West intersection experienced the third-highest crash total (22) and the highest crash rate by far, at 3.58 crashes/MVE. Approximately 36 percent of all reported crashes resulted in injury at this intersection. There are currently no improvements planned for this intersection, or the intersections of Neibauer Road/48th Street West, Hesper Road/48th Street West, Central

Table 5.2 Crash History - Frequency and Severity

Intersection	2020-2024 DEV[1]	Reported Crashes[2]	Crash Type			Crash Data[3]		
			PDO	Injury	Fatality	Average Crash Frequency (Crash/Yr)	Crash Rate (Crash/MVE)	Severity Index
Rimrock Rd & 70th St W	893	1	1	0	0	0.20	0.61	1.00
Rimrock Rd & 62nd St W	3459	14	10	4	0	2.80	2.22	1.57
Rimrock Rd & 54th St W	11985	10	7	3	0	2.00	0.46	1.60
Rimrock Rd & 46th St W	10430	2	1	1	0	0.40	0.11	2.00
Grand Ave & 64th St W	5836	5	4	1	0	1.00	0.47	1.40
Grand Ave & 62nd St W	5699	12	8	4	0	2.40	1.15	1.67
Grand Ave & 56th St W	8875	6	4	2	0	1.20	0.37	1.67
Grand Ave & 54th St W	9675	6	3	2	1	1.20	0.34	2.83
Grand Ave & 48th St W	13654	18	16	2	0	3.60	0.72	1.22
Central Ave & 64th St W	4372	10	6	4	0	2.00	1.25	1.80
Central Ave & 56th St W	4643	4	4	0	0	0.80	0.47	1.00
Central Ave & 48th St W	9603	9	8	1	0	1.80	0.51	1.22
King Ave & 64th St W	8208	30	10	20	0	6.00	2.00	2.33
King Ave & 56th St W	10466	14	9	4	1	2.80	0.73	2.07
King Ave & 48th St W	11649	26	16	10	0	5.20	1.22	1.77
Hesper Rd & 56th St W	5138	19	11	7	0	3.80	2.03	1.78
Hesper Rd & 48th St W	4550	14	9	5	0	2.80	1.69	1.71
Neibauer Rd & 56th St W	3370	22	14	8	0	4.40	3.58	1.73
Neibauer Rd & 48th St W	3410	11	7	4	0	2.20	1.77	1.73
Neibauer Rd & Shiloh Rd	4720	6	2	4	0	1.20	0.70	2.33

[1] Daily Entering Volume (DEV) estimated from 2024 peak hour counts and 2020-2024 MDT published ADTs

[2] Crashes reported from January 1, 2020 to December 31, 2024

[3] Crash rates expressed as crashes per million vehicles entering (MVE)

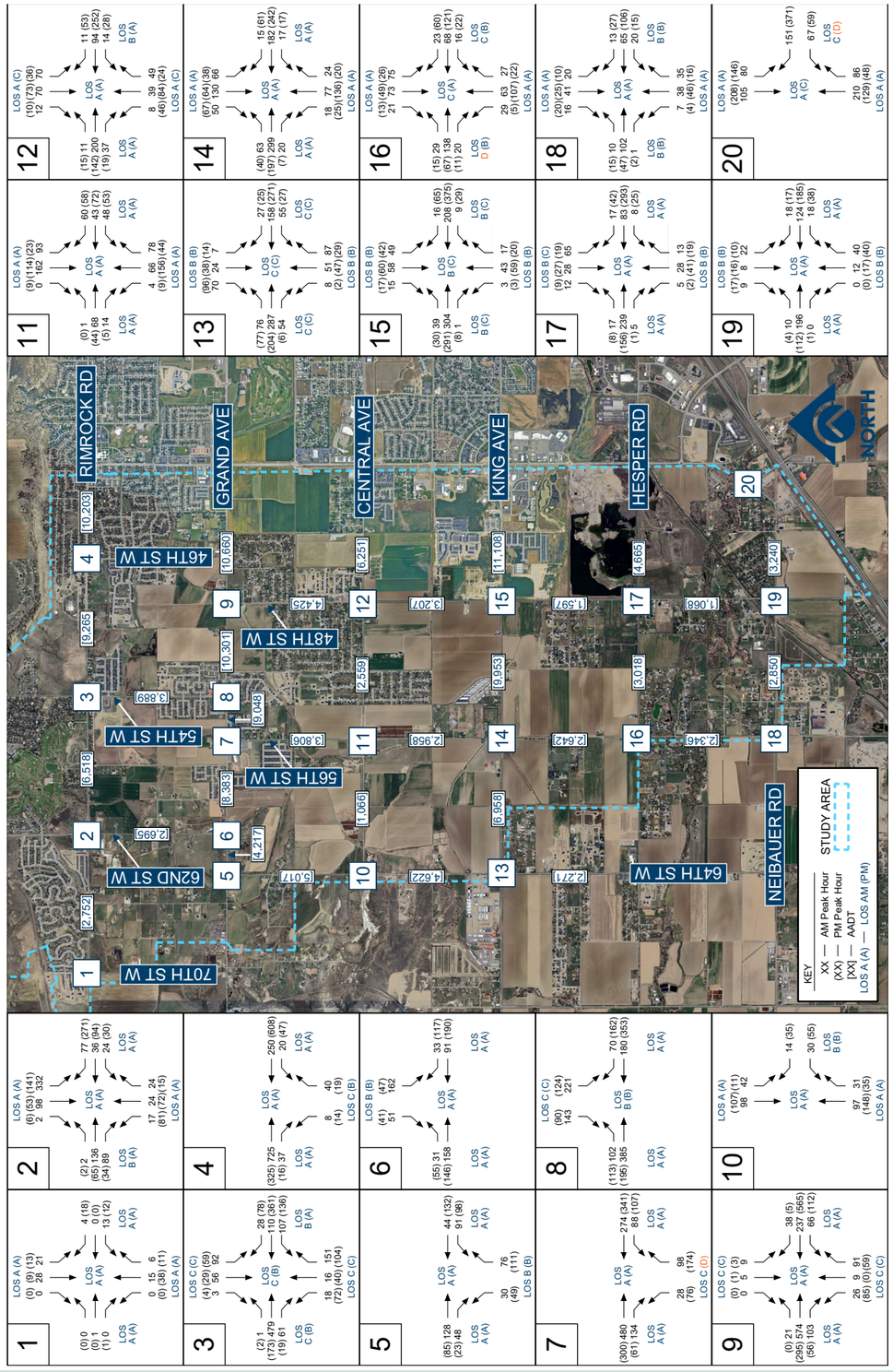

Figure 5.2: Existing Conditions (2024) Traffic Volumes

Avenue/64th Street West, or Grand Avenue/62nd Street West.

The remaining intersections on the above high crash rate list are all planned to have roundabouts or signals installed. For intersections without planned improvements, all-way stop-control should be considered where practical to reduce crash risk and severity.

It should also be noted that while the Neibauer Road/Shiloh Road intersection did not have an elevated crash rate, two-thirds of crashes at this intersection resulted in injury. The intersection's configuration is abnormal, with stop-control on the northbound approach, and free-flowing traffic for southbound and northwestbound vehicles, as well as a skew. Conversion to all-way stop-control may reduce driver confusion and provide a safer condition at this intersection. This could be paired with a reduction in the turning radius for the northwestbound right turns.

Traffic Volumes

Sanbell collected AM and PM peak-hour turning-movement counts at seven major intersections in May, August, and September 2023, and at 13 additional major intersections in January and February 2024. This data was used to support the existing-conditions traffic analysis and to calibrate the traffic model. Peak periods generally occurred from 7:15–8:15 a.m. and 4:45–5:45 p.m. Seasonal adjustment factors provided by the City of Billings were applied to the raw counts. Figure 5.2 summarizes the resulting peak-hour turning-movement volumes, with full count details provided in Appendix C.

Average Daily Traffic (ADT) volumes were compiled for key roadway segments using data collected by Sanbell and data provided by MDT. In total, 32 roadway segments were evaluated—18 with new data collected by the Project Team and the remainder from MDT. Using these datasets and a K-factor approach (represents the proportion of the Average Annual Daily Traffic [AADT] this is expected to occur during the peak hour), Sanbell estimated the AADT volumes for the study-area corridors. In addition to the previously mentioned turning-movement volumes, Figure 5.2 also presents the AADT estimates for the 2024 Existing Conditions scenario. The MPO's raw traffic count data are included in Appendix C.

Pedestrian Traffic Volumes

For the purposes of this analysis, bicycle volumes are included within the total pedestrian counts.

The highest pedestrian activity occurred during the May 2023 traffic count at the Grand Avenue/56th Street West intersection adjacent to Ben Steele Middle School. During the AM peak hour, 62 pedestrians were recorded crossing the south leg of 56th Street West, with more than 90% traveling toward the school. A second peak occurred between 2:30 and 3:30 PM, when 41 pedestrians crossed the same approach, this time with most traveling away from the school. Pedestrian activity at all other intersections within the study area was minimal.

Intersection Traffic Operations

Sanbell conducted AM and PM peak-hour intersection capacity analyses for the major intersections in the study area using Synchro (Version 12), which applies methodologies from the Highway Capacity Manual, 7th Edition (Transportation Research Board, 2022). Level of service (LOS) is a qualitative measure of intersection performance that reflects operational conditions such as speed, travel time, freedom of movement, delay, and overall comfort and convenience. LOS ranges from A, representing free-flowing operations with minimal delay, to F, representing severe congestion and high delay.

The purpose of this analysis was to establish a baseline for existing (2024) operating conditions and to identify intersections that are currently experiencing—or are nearing—capacity deficiencies during peak periods. Table 5.5 presents the results of the Existing Conditions (2024) intersection capacity evaluation .

The City of Billings and the Montana Department of Transportation generally use Level of Service (LOS) C as the minimum acceptable standard for existing intersection operations. The 2024 Existing Conditions analysis indicates that the 56th Street West/Hesper Road intersection and the Autumn Lane/Neibauer Road/Shiloh Road intersection operate below this threshold, with at least one approach functioning at LOS D during the AM or PM peak periods. Projected maximum queue lengths at all study-area intersection approaches were moderate to negligible, including those operating below the LOS standard. A detailed capacity summary table and the full set of capacity calculation worksheets for the 2024 Existing Conditions scenario are provided in Appendix D.

Corridor Traffic Operations

In addition to the peak-hour intersection analysis, Sanbell evaluated daily corridor LOS to assess overall capacity constraints and identify whether road widening or other improvements may be needed. This analysis used the Existing Conditions (2024) AADT volumes shown in Figure 5.2.

Planning-level corridor LOS was estimated by comparing Existing Conditions (2024) AADT volumes to assumed capacity values (noted in Table 5.3) to develop volume-to-capacity (V/C) ratios. Table 5.4 summarizes LOS categories and associated traffic conditions. In coordination with the City of Billings, LOS D was identified as the minimum acceptable threshold for corridor operations in both the West End Multi-Modal Planning Study and this study. Table 5.3 presents typical LOS thresholds by functional classification based on V/C ratios. Figure 5.3 shows the resulting LOS for the Existing Conditions (2024) scenario. Most corridors currently operate at LOS C or better; however, Grand Avenue and King Avenue West east of 48th Street West operate at LOS D. The color-coding used in Figure 5.3 aligns with Tables 5.3 and 5.4.

Table 5.3: Level of Service (LOS) Thresholds by Functional Classification

LOS Threshold	A-C	D	E	F
Arterials/Collectors	Upper Limit V/C Cutpoints			
	0.58	0.75	0.92	>0.92
Principal Arterial (Daily Capacity Per Lane - 9,000)	Total Daily Volume			
2-Lane	10,440	13,500	16,560	≥18,000
3-Lane	11,480	14,850	18,220	≥19,800
4-Lane	20,880	27,000	33,120	≥36,000
5-Lane	21,920	28,350	34,780	≥37,800
Minor Arterial (Daily Capacity Per Lane - 7,000)	Total Daily Volume			
2-Lane	8,120	10,500	12,880	≥14,000
3-Lane	8,930	11,550	14,170	≥15,400
4-Lane	16,240	21,000	25,760	≥28,000
5-Lane	17,050	22,050	27,050	≥29,400
Collector (Daily Capacity Per Lane - 6,000)	Total Daily Volume			
2-Lane	6,960	9,000	11,040	≥12,000
3-Lane	7,660	9,900	12,140	≥13,200
4-Lane	13,920	18,000	22,080	≥24,000
5-Lane	14,620	18,900	23,180	≥25,200

Table 5.4: Level of Service (LOS) Capacity Analysis Descriptions

	Level of Service	Traffic Flow	Description
Uncongested	A		• Light traffic • Free flow speeds
	B		• Slightly increased traffic levels • Still free flow speeds
	C		• Approaching moderate congestion levels • Speeds near free flow
Congesting	D		• Speeds reduced • Lane changes restricted due to traffic
Congested	E		• Congestion • Irregular traffic flow
	F		• Road at capacity • Gridlock with frequent stops

Table 5.5: Existing Conditions (2024) Intersection Capacity Calculation Results

Intersection	Approach	Existing (2024) AM Peak Avg Delay (s/veh)	AM Peak LOS	AM Peak 95th % Queue (veh)	PM Peak Avg Delay (s/veh)	PM Peak LOS	PM Peak 95th % Queue (veh)
Intersection Control		*One-Way Stop-Control (NB)*					
70th Street West & Rimrock Road	WB	0.0	A	0	0.0	A	0
	NB	0.0	A	0	0.0	A	0
	SB	8.8	A	1	8.9	A	1
	Intersection	6.8	A	--	2.5	A	--
Intersection Control		*Roundabout*					
62nd Street West & Rimrock Road	EB	10.6	B	2	4.3	A	1
	WB	4.5	A	1	6.5	A	2
	NB	7.9	A	1	4.9	A	1
	SB	9.5	A	5	4.9	A	1
	Intersection	8.8	A	--	5.5	A	--
Intersection Control		*Signalized*					
54th Street West & Rimrock Road	EB	22.7	C	16	10.8	B	4
	WB	12.3	B	3	9.1	A	8
	NB	31.1	C	2	33.0	C	4
	SB	35.3	D	5	34.8	C	3
	Intersection	23.7	C	--	16.6	B	--
Intersection Control		*One-Way Stop-Control (NB)*					
46th Street West & Rimrock Road	EB	0.0	A	0	0.0	A	0
	WB	0.7	A	1	0.6	A	1
	NB	16.7	C	1	13.3	B	1
	Intersection	0.9	A	--	0.8	A	--
Intersection Control		*One-Way Stop-Control (NB)*					
64th Street West & Grand Avenue	EB	0.0	A	0	0.0	A	0
	WB	5.3	A	1	3.3	A	1
	NB	10.8	B	1	11.0	B	1
	Intersection	4.6	A	--	4.8	A	--
Intersection Control		*One-Way Stop-Control (SB)*					
62nd Street West & Grand Avenue	EB	1.2	A	1	2.2	A	1
	WB	0.0	A	0	0.0	A	0
	SB	14.6	B	3	13.5	B	1
	Intersection	6.9	A	--	3.0	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
56th Street West & Grand Avenue	EB	0.0	A	0	0.0	A	0
	WB	2.5	A	1	2.0	A	1
	NB	24.3	C	2	19.1	C	2
	SB	0.0	A	0	0.0	A	0
	Intersection	4.0	A	--	5.0	A	--

Intersection	Approach	Existing (2024) AM Peak Avg Delay (s/veh)	AM Peak LOS	AM Peak 95th % Queue (veh)	PM Peak Avg Delay (s/veh)	PM Peak LOS	PM Peak 95th % Queue (veh)
Intersection Control		*Signalized*					
54th Street West & Grand Avenue	EB	7.3	A	8	4.0	A	3
	WB	8.6	A	6	7.6	A	9
	SB	32.9	C	9	32.9	C	5
	Intersection	15.2	B	--	11.1	B	--
Intersection Control		*Signalized*					
48th Street West & Grand Avenue	EB	6.5	A	9	3.9	A	5
	WB	6.3	A	4	8.9	A	15
	NB	30.6	C	2	28.5	C	3
	SB	26.4	C	1	25.8	C	1
	Intersection	9.0	A	--	9.7	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
64th Street West & Central Avenue	WB	10.6	B	1	10.9	B	1
	NB	0.0	A	0	0.0	A	0
	SB	2.3	A	1	0.7	A	0
	Intersection	2.5	A	--	2.3	A	--
Intersection Control		*Roundabout*					
56th Street West & Central Avenue	EB	5.0	A	1	4.2	A	1
	WB	4.8	A	1	5.1	A	1
	NB	4.7	A	1	4.7	A	1
	SB	6.1	A	2	4.6	A	1
	Intersection	5.4	A	--	4.7	A	--
Intersection Control		*All-Way Stop-Control*					
48th Street West & Central Avenue	EB	10.1	B	2	10.5	B	2
	WB	8.9	A	1	13.1	B	3
	NB	9.0	A	1	11.3	B	2
	SB	9.5	A	1	10.3	B	1
	Intersection	9.5	A	--	11.7	B	--
Intersection Control		*All-Way Stop-Control*					
64th Street West & King Avenue	EB	24.8	C	8	15.6	C	4
	WB	16.5	C	4	23.4	C	8
	NB	12.6	B	2	11.2	B	1
	SB	11.5	B	1	11.4	B	1
	Intersection	18.8	C	--	18.3	C	--
Intersection Control		*Roundabout*					
56th Street West & King Avenue	EB	8.7	A	3	5.2	A	2
	WB	5.7	A	2	6.7	A	2
	NB	6.8	A	1	5.9	A	2
	SB	6.6	A	2	5.4	A	1

Intersection	Approach	Existing (2024) AM Peak Avg Delay (s/veh)	AM Peak LOS	AM Peak 95th % Queue (veh)	PM Peak Avg Delay (s/veh)	PM Peak LOS	PM Peak 95th % Queue (veh)
Intersection Control		*All-Way Stop-Control*					
48th Street West & King Avenue	EB	15.0	B	4	15.6	C	4
	WB	11.6	B	2	23.4	C	8
	NB	10.3	B	1	11.2	B	1
	SB	11.1	B	2	11.4	B	1
	Intersection	12.9	B	--	18.3	C	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
56th Street West & Hesper Road	EB	27.8	D	5	13.6	B	1
	WB	18.9	C	2	14.7	B	2
	NB	1.8	A	1	0.3	A	0
	SB	3.4	A	1	2.3	A	1
	Intersection	15.6	C	--	8.4	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
48th Street West & Hesper Road	EB	0.5	A	0	0.4	A	0
	WB	0.6	A	0	0.5	A	1
	NB	12.3	B	1	14.2	B	1
	SB	14.9	B	2	16.7	C	1
	Intersection	4.9	A	--	3.4	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
56th Street West & Neibauer Road	EB	11.8	B	1	10.7	B	1
	WB	11.6	B	1	11.2	B	1
	NB	0.7	A	0	0.4	A	0
	SB	1.9	A	1	1.8	A	0
	Intersection	7.0	A	--	7.7	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
48th Street West & Neibauer Road	EB	0.4	A	0	0.3	A	0
	WB	0.9	A	0	1.2	A	1
	NB	10.9	B	1	10.4	B	1
	SB	12.6	B	1	12.2	B	1
	Intersection	2.6	A	--	3.2	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
Autumn Lane & Neibauer Road & Shiloh Road	WB	15.3	C	2	31.3	D	10
	NB	0.0	A	0	0.0	A	0
	SB	3.6	A	1	3.3	A	1
	Intersection	5.5	A	--	17.3	C	--

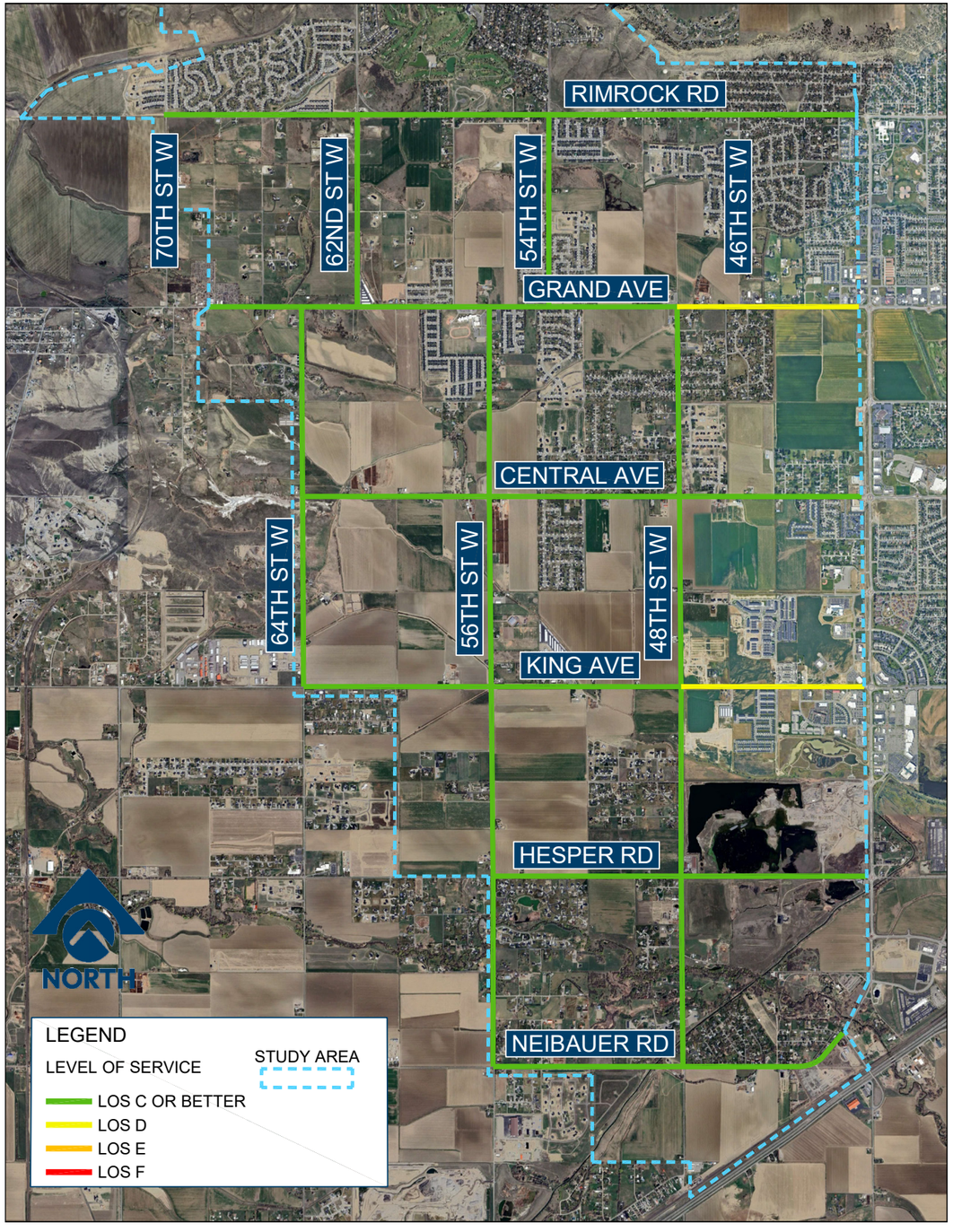

Figure 5.3: Existing Conditions (2024) Corridor Level of Service (LOS)

Active Transportation Facilities

"Active transportation" primarily refers to walking and bicycling, but it also includes other human-powered modes such as skateboards, kick scooters, and rollerblades. These trips provide affordable, healthy options for reaching jobs, schools, shopping areas, and recreational destinations. Just as roadway networks connect places for drivers, active transportation networks link people to their destinations using sidewalks, trails, low-traffic neighborhood streets, side paths, and bike lanes.

Figure 5.5 shows the existing active transportation network within the study area. Outside of sidewalks within developments, there are few sidewalks, side paths, trails, or bike lanes. This limited network is largely due to the area's predominantly undeveloped and agricultural character, especially south of Central Avenue. Just outside the eastern edge of the study boundary, development becomes denser as it nears the Billings urban core, where active transportation facilities are more common. High-quality paths along the eastern edge include the Rimrock Road Trail, Big Ditch Trail, Shiloh Road Trail, King Avenue West Trail, Zimmerman Trail, Gabel Road Trail, and the Olympic & Harvest Subdivision Trails. Monad Road also includes striped bike lanes, and sidewalks are generally present.

Although several low-stress facilities exist nearby, the study area lacks meaningful connections to them. Roads that could provide access are primarily arterials with narrow shoulders and speed limits ranging from 45 to 60 mph. In addition to high speeds, these corridors often include irrigation and borrow ditches, creating steep slopes and leaving little room for active transportation facilities without major reconstruction. Sidewalks and trails within subdivisions are similarly isolated, with limited connectivity to the broader Billings network just east of the study area.

What Type of Bike Rider are You?

For an active transportation system to be effective, it must offer a connected network that serves users with different equipment, comfort levels, and skills. For example, a corridor may include both side paths and bike lanes—allowing experienced riders to travel at higher speeds near traffic while providing children or more cautious users with a separate, more comfortable option. In Billings, on arterial roadways and in some cases, larger collectors, a separated multi-use path is used in lieu of on street bike facilities. However, each roadway is assessed on its own distinction.

A frequently referenced Portland Bureau of Transportation study identifies four general types of cyclists: the Strong and Fearless, the Enthused and Confident, the Interested but Concerned, and the No Way No How groups. Figure 5.4 illustrates the typical distribution of these categories and describes each. These categories help explain how different bikeway types influence a rider's comfort level.

The typology suggests that most potential riders—about 67 percent—fall within the Enthused and Confident or Interested but Concerned groups. This indicates

substantial opportunity to increase cycling by investing in a low-stress bikeway network that feels comfortable for a broader range of users. While the exact percentages in Billings may differ, the framework is useful for understanding which network characteristics can encourage more people to bike.

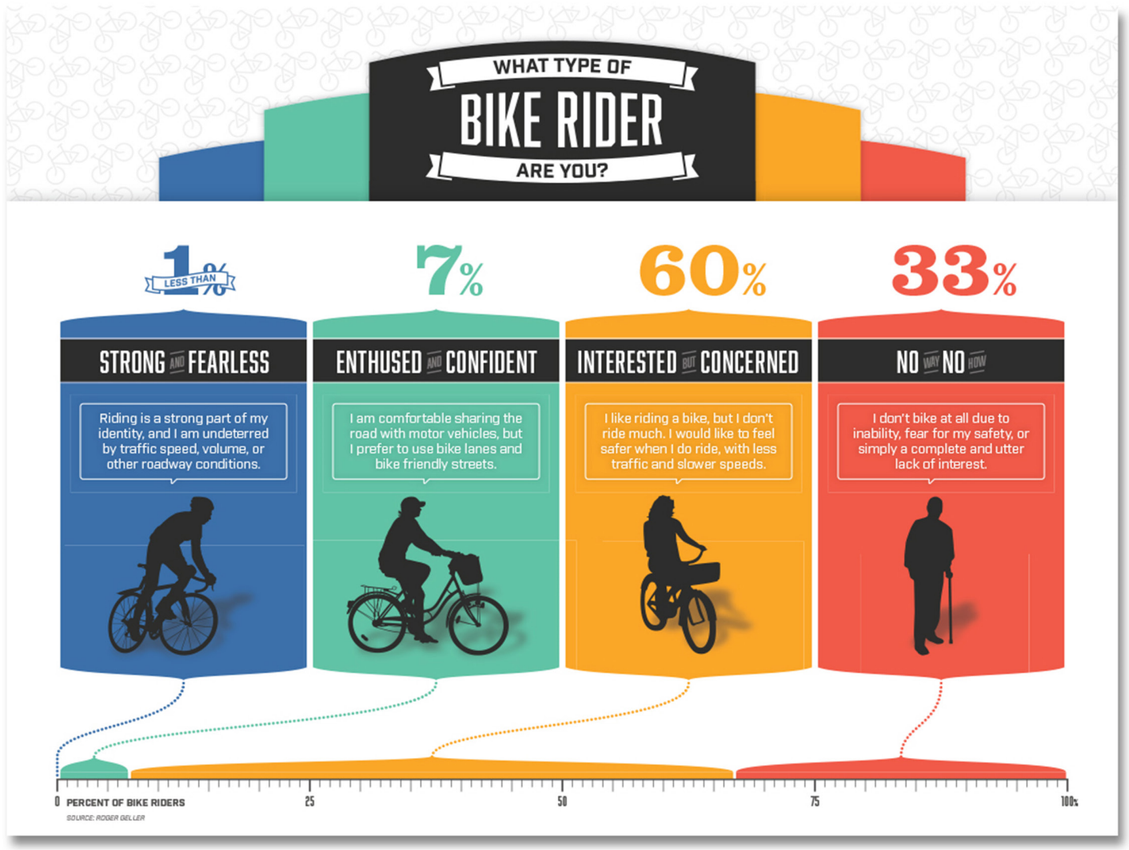

Figure 5.4: Types of Bicycle Riders

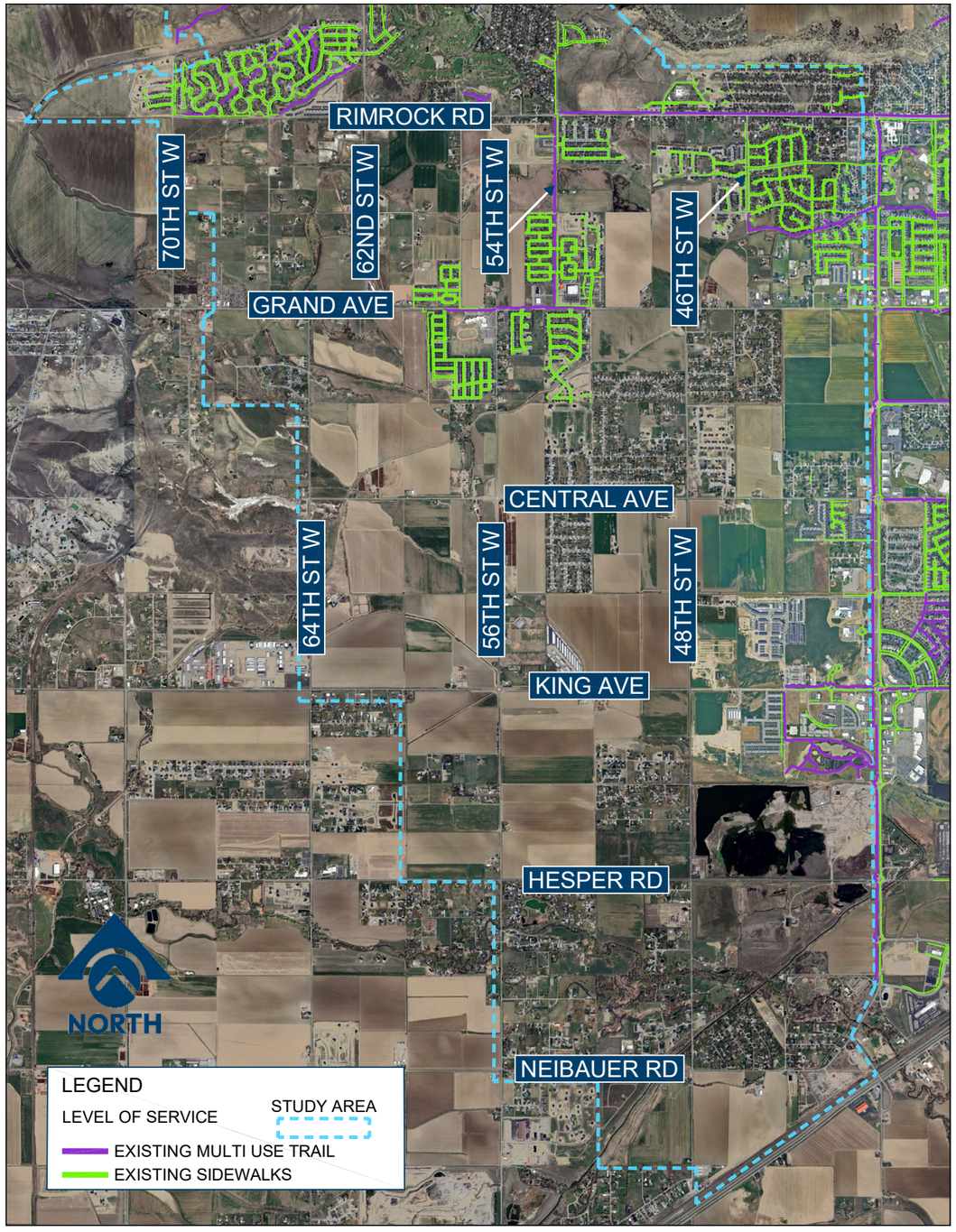

Figure 5.5: Existing Study Area Active Transportation Facilities

Level of Traffic Stress

Level of Traffic Stress (LTS), developed by Mekuria, Furth, and Nixon (2012), is a modern method for evaluating how roadway characteristics influence the stress experienced by bicyclists and, in turn, where they are likely to ride. Under this approach, roadway segments are classified into four stress levels—LTS 1 through LTS 4. Cyclists are grouped based on how much traffic stress they are willing to tolerate in different environments:

- LTS1: Most children can tolerate and feel safe while bicycling.
- LTS2: The mainstream adult population will tolerate and feel safe while bicycling.
- LTS3: Cyclists who are considered "enthused and confident" but still prefer having their own dedicated space for riding will tolerate and feel safe while bicycling.
- LTS4: A level tolerated only by those characterized as "strong and fearless", which comprises just 0.5 percent of the population. The high-stress streets that LTS4 groups will ride are those with high speed limits, multiple travel lanes, limited or non-existent bike lanes and signage, and large distances to cross at intersections.

Table 5.6 summarizes the variables used to assign LTS scores to the roadway network. LTS follows a "weakest link" principle, meaning the stress level for a corridor, intersection approach, or crossing is determined by its most stressful segment. As a result, an entire route takes on the score of its highest-stress portion. For example, a cross-town trip may include long stretches of LTS 1 and LTS 2, but a single LTS 3 segment creates a barrier—only riders comfortable with LTS 3 would use the full route.

LTS analysis in this study was limited to minor arterials and arterials because local and collector streets offer limited connectivity, requiring most bicyclists to travel on the arterial network. Figure 5.6 shows the resulting LTS classifications.

The analysis indicates that most arterials in the study area fall into LTS 4. Rimrock Road east of 54th Street West and 54th Street West are rated LTS 3. Grand Avenue between Wilderness Drive and 52nd Street West, and 56th Street West between Grand Avenue and Stockman Avenue, are rated LTS 2. The primary factors contributing to high stress levels are vehicle speeds above 35 mph and the absence of bike lanes or rideable shoulders.

Table 5.6: Level of Traffic Stress (LTS) Variables

Level of Traffic Stress (LTS) Variable	Data Source
Direction	Derived
Mode separation (mixed flow or bicycle lane)	Bike trails, field review
Is this a residential street?	Calculated based on land use
Adjacent parking	Field review
Number of lanes in analysis direction	Number of lanes from centerline file
Is there a median?	Field review
Is there a Center line?	Field review
What is the prevailing speed? (Use speed limit if prevailing speed is not available)	Speed limit from Centerline file
Bike Lane + Parking Width (if bike lane is present)	Field review
How oftern do bike lane blockages occur?	Estimate

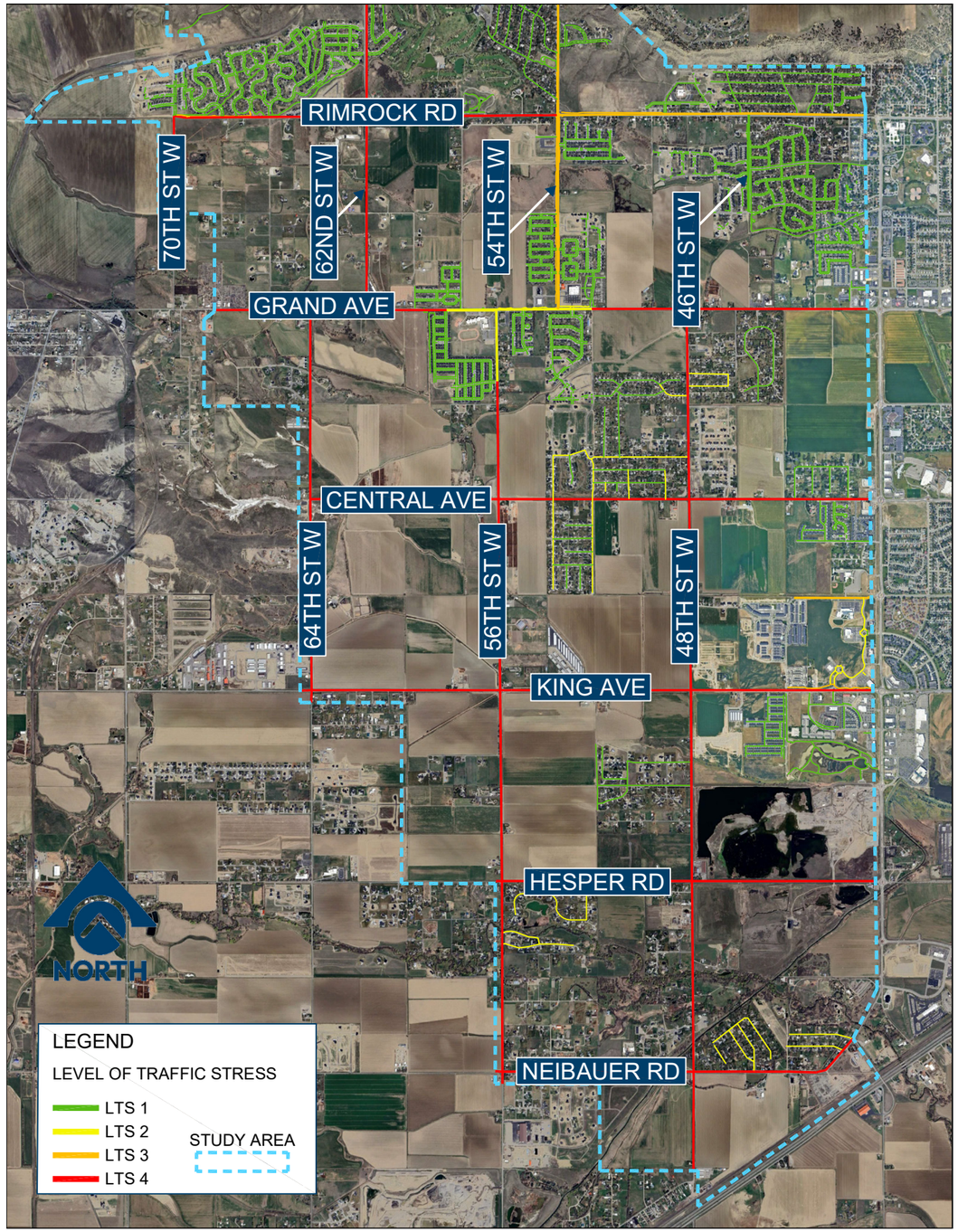

Figure 5.6: Existing Condition (2024) Level of Traffic Stress (LTS)

Land Development Forecasting

The Sanbell team collaborated with the City of Billings to evaluate every parcel in the study area and estimate the probability of future development. After the draft Future Land Use Map (FLUM) was updated to reflect public input, multimodal transportation forecasting began. Trip generation for already developed areas was based on observed traffic counts. For undeveloped areas, traffic volumes were estimated by applying industry-standard trip rates to the projected number of dwelling units and the anticipated commercial square footage for each future land use category.

This process, described in the following section, also incorporated historic development trends, zoning allowances, height and building coverage limits, and dwelling-per-structure standards. In categories permitting both residential and commercial uses, the mix of each was estimated using patterns observed in the plan area and the broader Billings metro region.

Because the FLUM shows substantially more potential development than the plan area's projected population growth is likely to create, a reduction factor was applied to trip-generation estimates (as detailed in the following section). This factor was based on each parcel's designation in the City of Billings Limits of Annexation Map. City/ County Planning staff reviewed and approved all assumptions used to estimate future residential and commercial development within the study area. These assumptions, along with the traffic generation calculation workflow, are provided in Appendix E. Figure 5.7 identifies the undeveloped FLUM parcels.

Trip-generation estimates were developed using the Institute of Transportation Engineers' Trip Generation Manual, 11th Edition—the industry standard for evaluating development impacts. For this study, the land use categories listed below were used to calculate projected trips, and the results are summarized in Table 5.7.

- Land Use 140 – Manufacturing
- Land Use 150 – Warehousing
- Land Use 210 – Single-Family Detached Housing
- Land Use 215 – Single-Family Attached Housing
- Land Use 220 – Multifamily Housing (Low- Rise)
- Land Use 230 – Low-Rise Residential with Ground-Floor Commercial
- Land Use 525 – High School
- Land Use 630 – Clinic
- Land Use 710 – General Office Building
- Land Use 820 – Shopping Center (>150K)
- Land Use 822 – Strip Retail Plaza (<40K)
- Land Use 850 – Supermarket
- Land use 912 – Drive-in Bank

Full buildout of the project area is projected to generate 114,224 gross average weekday

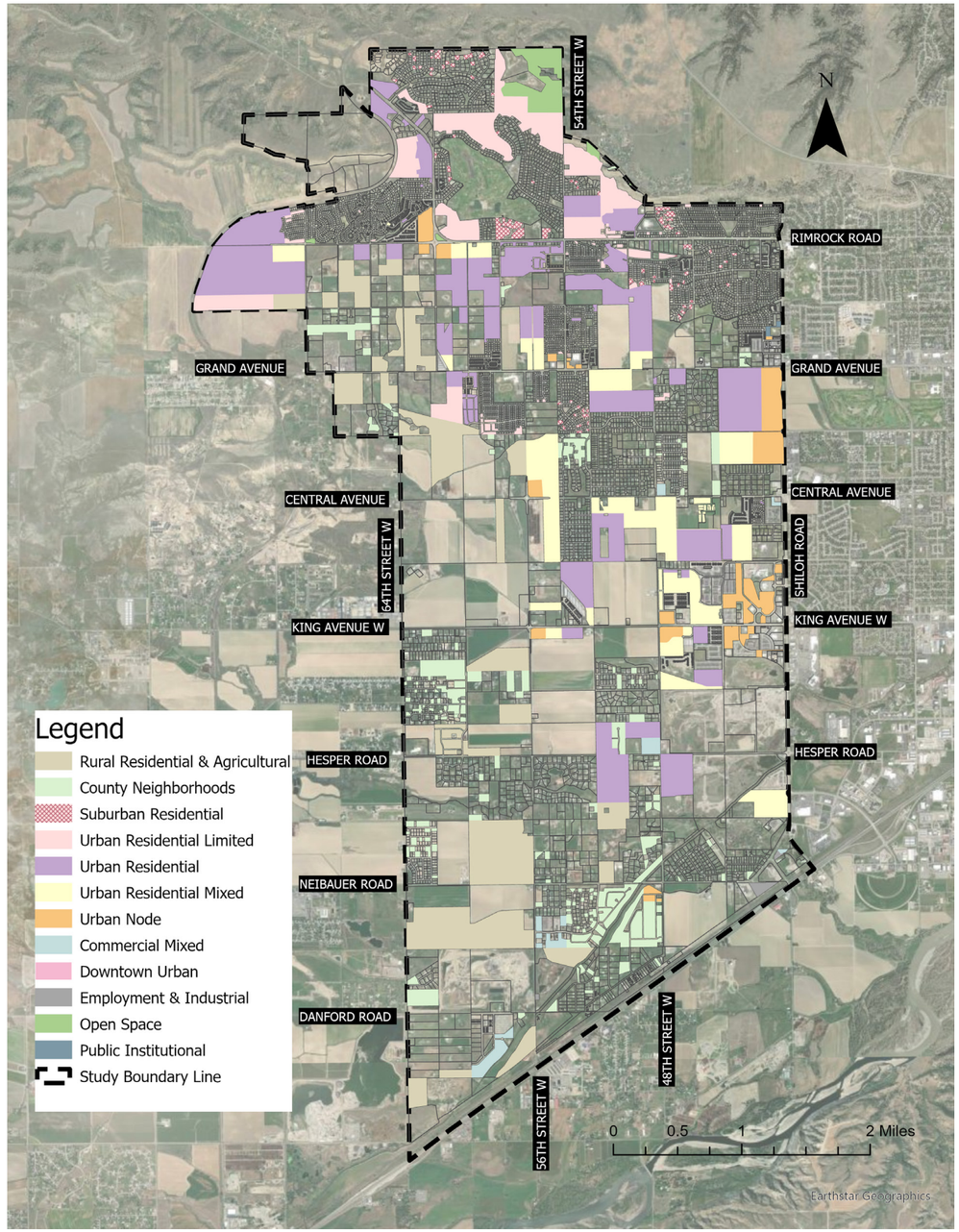

Figure 5.7: FLUM- Undeveloped Parcels

trips, including 7,775 trips (4,122 entering / 3,653 exiting) during the AM peak hour and 11,309 trips (5,543 entering / 5,766 exiting) during the PM peak hour.

Trip-generation estimates reflect the total number of trips associated with future development, but adjustments are needed to determine the number of external vehicle trips. These adjustments account for internal capture trips, pass-by trips, and trips made by alternate modes.

Internal capture (IC) trips occur entirely within the development and therefore do not affect external traffic. They are most common in mixed-use areas. For this study, all trips exchanged within future development areas were treated as internal. The study area is expected to generate 24,228 internal weekday trips, including 533 AM peak-hour trips (269 entering / 264 exiting) and 2,209 PM peak-hour trips (1,104 entering / 1,105 exiting).

Pass-by trips—intermediate stops made along a driver's primary route—were not calculated because these trips are typically associated with commercial sites and are not expected to be significant in this location.

Alternate mode trips (walking, biking, transit) are also expected to be limited due to the size of the study area, although some internal trips near schools may occur by bicycle or on foot. To remain conservative, trip-generation estimates were not reduced for alternate modes. A separate analysis of potential active transportation trips is provided later in this report.

After accounting for internal capture, the study area is projected to generate 89,996 new external weekday trips, including 7,242 AM peak-hour trips (3,853 entering / 3,389 exiting) and 9,100 PM peak-hour trips (4,439 entering / 4,661 exiting)

Growth Projections

Because the Future Land Use Map accommodates more growth than is projected for the plan area, future traffic projections were adjusted down using the methods described in Chapter 3. This resulted in traffic projections that are roughly consistent with the projected population growth rate arrived at in Appendix B, Future Land Use Map Production Methods.

The Billings Metropolitan Planning Organization (MPO) Long Range Transportation Plan (LRTP) assumes an annual traffic growth rate of 1.5%, based on historic trends in the MPO planning area. After coordinating with City staff and comparing the annexation-based results with the LRTP forecast, the project team selected the 3.1% rate for projecting traffic volumes for the Future (2044) scenario.

Committed and Planned Projects

Several projects aimed at improving multimodal operations and safety have been committed through the City, County, and MDT capital improvement programs, or are tentatively planned for the near future. The following paragraphs summarize these committed or planned projects based on

Table 5.7: Trip Generation Summary

Trip-generation estimates were developed using the Institute of Transportation Engineers' Trip Generation Manual, 11th Edition—the industry standard for evaluating development impacts. Each land use category has an average rate of trips per associated with it, and this average rate is used as a multiplier for the number of quantity of each type of unit produced. For example, the average rate of daily trips for single-family detached housing is 9.43. In the RRA zone, the projection is 43 dwelling units. 43 x 9.43=405.49 trips, which is rounded to 405 trips per day. The list of average rates can be viewed in Appendix E.

Land Use	Independent Variable		Average Weekday
	Quantity	Units	total
Rural Residential & Agriculture - RRA			
Single-Family Detached Housing[3]	43	Dwelling Units	405
Internal Capture Trips**			67
Total RRA New External Trips			338
County Neighborhoods - CN			
Single-Family Detached Housing[3]	96	Dwelling Units	905
Internal Capture Trips**			151
Total CN New External Trips			754
Urban Residential Limited - URL			
Single-Family Detached Housing[3]	1103	Dwelling Units	10401
Internal Capture Trips**			1737
Total URL New External Trips			8664
Urban Residential - UR			
Single-Family Attached Housing[4]	196	Dwelling Units	1411
Low-Rise Residential with Ground-Floor Commercial[6]	754	Dwelling Units	2594
Multifamily Housing (Low-Rise)[5]	1781	Dwelling Units	12004
Internal Capture Trips**			2673
Total UR New External Trips			13336
Urban Residential Mixed - URM			
Multifamily Housing (Low-Rise)[5]	1381	Dwelling Units	9308
General Office Building[9]	524	1000 SF GFA	5683
Clinic[8]	72	1000 SF GFA	2724
Strip Retail Plaza (<40K)[11]	454	1000 SF GFA	24743
Internal Capture Trips**			10189
Total URM New External Trips			32269
Urban Node - UN			
Multifamily Housing (Low-Rise)[5]	1561	Dwelling Units	10521
General Office Building[9]	192	1000 SF GFA	2084
Shopping Center (>150K)[10]	382	1000 SF GFA	14154
Clinic[8]	197	1000 SF GFA	7407
Supermarket[12]	38	1000 SF GFA	3536
Drive-in Bank[13]	9	1000 SF GFA	854
Internal Capture Trips**			8989
Total UN New External Trips			29567
Commercial Mixed - CM			
Multifamily Housing (Low-Rise)[5]	31	Dwelling Units	209
Warehousing[2]	118	1000 SF GFA	202
General Office Building[9]	128	1000 SF GFA	1385
Internal Capture Trips**			422
Total CM New External Trips			1374
Employment & Industrial - EI			
Manufacturing[1]	67	1000 SF GFA	318
Total EI New External Trips			318
Public Institution - PI			
High School[7]	1740	Students	3376
Total PI New External Trips			3376
Total Buildout Gross Trips			114224
Total Buildout Internal Capture Trips			24228
Total Buildout New External Trips			89996

current information.

Street and Intersection Projects

The City of Billings has approved three safety-focused projects within the study area:

- Rimrock Road Improvements (62nd St W to Clearview Dr) – Scheduled to begin in 2025, this project will reconstruct Rimrock Road to full arterial and complete streets standards, including new multi-modal facilities along the corridor.
- Grand Avenue Improvements (43rd St W to 62nd St W) – Planned for 2028, this project will upgrade Grand Avenue to an arterial standard, incorporate multi-modal elements, and install a traffic signal at 56th Street West to improve safety near Ben Steele Middle School.
- 54th Street West Reconstruction (Grand Ave to Rimrock Rd) – Expected to start in 2028, this project will reconstruct the corridor to arterial and complete streets standards and may include auxiliary turn lanes, shoulders, multi-modal features, and storm drain upgrades.

Sanbell is also under contract with Yellowstone County to reconstruct the Hesper Road/56th Street West intersection. Due to long-standing safety concerns, the intersection has been redesigned as a single-lane roundabout with street lighting. Pedestrian facilities are not included. Construction timing depends on right-of-way acquisition.

Because right-of-way negotiations have delayed the Hesper/56th roundabout, its funding has been reassigned to reconstruct the Central Avenue/48th Street West intersection. This project will include a new traffic signal and auxiliary turn lanes on all approaches, with construction scheduled for 2026.

Sanbell and HDR are additionally under contract with MDT to design single-lane roundabouts at King Avenue West/64th Street West and King Avenue West/48th Street West to maintain consistency along the corridor.

The City of Billings has also noted concerns with periodic closures of Zimmerman Trail, a key connection between West Billings and Montana Highway 3. These closures can overload alternate routes. While no project is currently programmed, a new connection from Molt Road to Montana Highway 3—known as the Molt Connector—has been identified as a critical link. In addition to improving access to Highway 3 and the top of the Rimrocks, it would create another ingress/egress point for the study area. The Billings Roadway Functional Classification Map already identifies the Molt Connector as a proposed Minor Arterial.

At this time, the Project Team is not aware of any additional committed or planned street or intersection projects within or immediately adjacent to the study area.

Future 2044 Operations Analysis

Intersection Traffic Operations

Sanbell completed intersection capacity analyses for the Future (2044) scenario at all major intersections within the study area. Future traffic volumes were developed using the Billings MPO Long Range Transportation Plan 3.1% average annual growth rate. Synchro (Version 12) was used to analyze stop-controlled and signalized intersections, while Sidra (Version 10) was used for roundabout analyses.

The analysis assumed existing traffic control and lane configurations for all intersections except the following, which reflect planned improvements:

- King Ave W/64th St W, King Ave W/48th St W, and 56th St W/Hesper Rd, which were modeled as single-lane roundabouts.
- Grand Ave/56th St W and Central Ave/48th St W, which were modeled with traffic signals currently under design as part of committed projects.

Table 5.8 presents the results of the Future (2044) intersection capacity analysis, with detailed calculation sheets provided in Appendix F. Figure 5.8 summarizes the projected 2044 traffic conditions.

For this study, LOS C at the intersection level (not individual approaches) is considered the minimum acceptable performance threshold. Under the Future (2044) scenario, four intersections are projected to operate below LOS C during the AM peak hour, and two are projected to fall below LOS C during the PM peak hour. Among intersections that remain acceptable, five are expected to experience LOS D conditions on one or more approaches during the AM peak hour, and one during the PM peak hour.

The following intersections are projected to fall below LOS C during one or both peak periods:

- 54th St W & Rimrock Rd – AM Peak
- 56th St W & Grand Ave – AM Peak
- 48th St W & Grand Ave – AM and PM Peak
- Autumn Ln/Neibauer Rd/Shiloh Rd – AM and PM Peak

Figure 5.8: Future (2044) Intersection Capacity Calculation Results

Intersection	Approach	Future (2044) AM Peak Avg Delay (s/veh)	AM Peak LOS	AM Peak 95th % Queue (veh)	PM Peak Avg Delay (s/veh)	PM Peak LOS	PM Peak 95th % Queue (veh)
Intersection Control		*One-Way Stop-Control (NB)*					
70th Street West & Rimrock Road	WB	0.0	A	0	0.0	A	0
	NB	0.0	A	0	0.0	A	0
	SB	9.0	A	1	9.1	A	1
	Intersection	6.3	A	--	2.8	A	--
Intersection Control		*Roundabout*					
62nd Street West & Rimrock Road	EB	43.2	E	10	6.7	A	2
	WB	5.4	A	2	18.6	C	16
	NB	13.8	B	2	8.2	A	2
	SB	15.4	C	15	9.2	A	3
	Intersection	21.0	C	--	13.0	B	--
Intersection Control		*Signalized*					
54th Street West & Rimrock Road	EB	147.5	F	41	21.3	C	10
	WB	48.5	D	11	22.9	C	26
	NB	40.6	D	6	33.7	C	7
	SB	117.7	F	11	40.1	D	7
	Intersection	104.2	F	--	26.3	C	--
Intersection Control		*One-Way Stop-Control (NB)*					
46th Street West & Rimrock Road	EB	0.0	A	0	0.0	A	0
	WB	1.0	A	1	0.7	A	1
	NB	62.8	F	4	24.8	C	2
	Intersection	3.1	A	--	1.2	A	--
Intersection Control		*One-Way Stop-Control (NB)*					
64th Street West & Grand Avenue	EB	0.0	A	0	0.0	A	0
	WB	5.7	A	1	3.4	A	1
	NB	16.3	B	2	22.4	C	5
	Intersection	6.0	A	--	8.8	A	--
Intersection Control		*One-Way Stop-Control (SB)*					
62nd Street West & Grand Avenue	EB	1.3	A	1	2.5	A	1
	WB	0.0	A	0	0.0	A	0
	SB	53.9	F	11	29.0	D	4
	Intersection	22.3	C	--	5.2	A	--
Intersection Control		*Signalized*					
56th Street West & Grand Avenue	EB	26.1	C	48	12.7	B	16
	WB	72.2	E	7	16.1	B	14
	NB	83.7	F	4	41.2	D	7
	SB	0.0	A	3	0.0	A	0
	Intersection	47.8	D	--	20.8	C	--

Intersection	Approach	Future (2044) AM Peak Avg Delay (s/veh)	AM Peak LOS	AM Peak 95th % Queue (veh)	PM Peak Avg Delay (s/veh)	PM Peak LOS	PM Peak 95th % Queue (veh)
Intersection Control		*Signalized*					
54th Street West & Grand Avenue	EB	16.7	B	27	10.2	B	8
	WB	17.1	B	14	17.0	B	35
	SB	35.7	D	22	33.0	C	11
	Intersection	23.1	C	--	18.3	B	--
Intersection Control		*Signalized*					
48th Street West & Grand Avenue	EB	131.2	F	46	9.9	A	15
	WB	81.1	F	24	422.2	F	54
	NB	29.9	C	5	27.5	C	6
	SB	24.1	C	2	24.1	C	1
	Intersection	104.6	F	--	250.0	F	--
Intersection Control		*One-Way Stop-Control (WB)*					
64th Street West & Central Avenue	WB	13.5	B	1	15.0	C	2
	NB	0.0	A	0	0.0	A	0
	SB	2.4	A	1	0.7	A	1
	Intersection	3.0	A	--	3.3	A	--
Intersection Control		*Roundabout*					
56th Street West & Central Avenue	EB	7.4	A	1	4.8	A	1
	WB	5.8	A	2	7.6	A	2
	NB	7.2	A	2	6.2	A	3
	SB	8.3	A	3	6.2	A	2
	Intersection	7.3	A	--	6.5	A	--
Intersection Control		*Signalized*					
48th Street West & Central Avenue	EB	8.3	A	7	6.0	A	4
	WB	6.3	A	3	10.0	A	10
	NB	7.5	A	2	9.7	A	3
	SB	8.1	A	2	9.5	A	2
	Intersection	7.7	A	--	9.0	A	--
Intersection Control		*Roundabout*					
64th Street West & King Avenue	EB	15.9	C	15	8.5	A	4
	WB	9.1	A	3	11.5	B	7
	NB	13.7	B	3	7.3	A	1
	SB	6.6	A	2	10.0	A	3
	Intersection	12.7	B	--	9.8	A	--
Intersection Control		*Roundabout*					
56th Street West & King Avenue	EB	31.2	D	21	8.4	A	3
	WB	9.2	A	3	16.2	C	10
	NB	14.4	B	3	10.9	B	3
	SB	12.3	B	5	10.4	B	3
	Intersection	19.4	C	--	12.0	B	--

Intersection	Approach	Future (2044) AM Peak Avg Delay (s/veh)	AM Peak LOS	AM Peak 95th % Queue (veh)	PM Peak Avg Delay (s/veh)	PM Peak LOS	PM Peak 95th % Queue (veh)
Intersection Control		*Roundabout*					
48th Street West & King Avenue	EB	15.0	C	11	12.1	B	8
	WB	8.4	A	3	18.8	C	23
	NB	10.1	B	1	8.6	A	2
	SB	7.6	A	2	12.4	B	2
	Intersection	11.4	B	--	15.0	B	--
Intersection Control		*Roundabout*					
56th Street West & Hesper Road	EB	8.5	A	3	4.8	A	1
	WB	5.8	A	1	7.3	A	3
	NB	8.0	A	2	5.5	A	2
	SB	6.6	A	2	5.2	A	1
	Intersection	7.4	A	--	6.0	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
48th Street West & Hesper Road	EB	0.5	A	1	0.5	A	1
	WB	0.6	A	0	0.6	A	1
	NB	19.6	C	2	34.7	D	3
	SB	52.8	F	6	71.4	E	5
	Intersection	12.8	B	--	9.9	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
56th Street West & Neibauer Road	EB	16.9	C	3	13.3	B	1
	WB	16.7	C	2	14.5	B	3
	NB	0.7	A	0	0.4	A	0
	SB	2.0	A	1	1.3	A	0
	Intersection	10.2	B	--	9.3	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
48th Street West & Neibauer Road	EB	0.4	A	0	0.3	A	0
	WB	0.9	A	1	1.2	A	1
	NB	13.7	B	1	13.6	B	1
	SB	21.4	C	1	18.5	C	1
	Intersection	3.9	A	--	4.1	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
Autumn Lane & Neibauer Road & Shiloh Road	WB	146.8	F	19	726.6	F	91
	NB	0.0	A	0	0.0	A	0
	SB	1.1	A	1	3.7	A	1
	Intersection	46.8	E	--	378.9	F	--

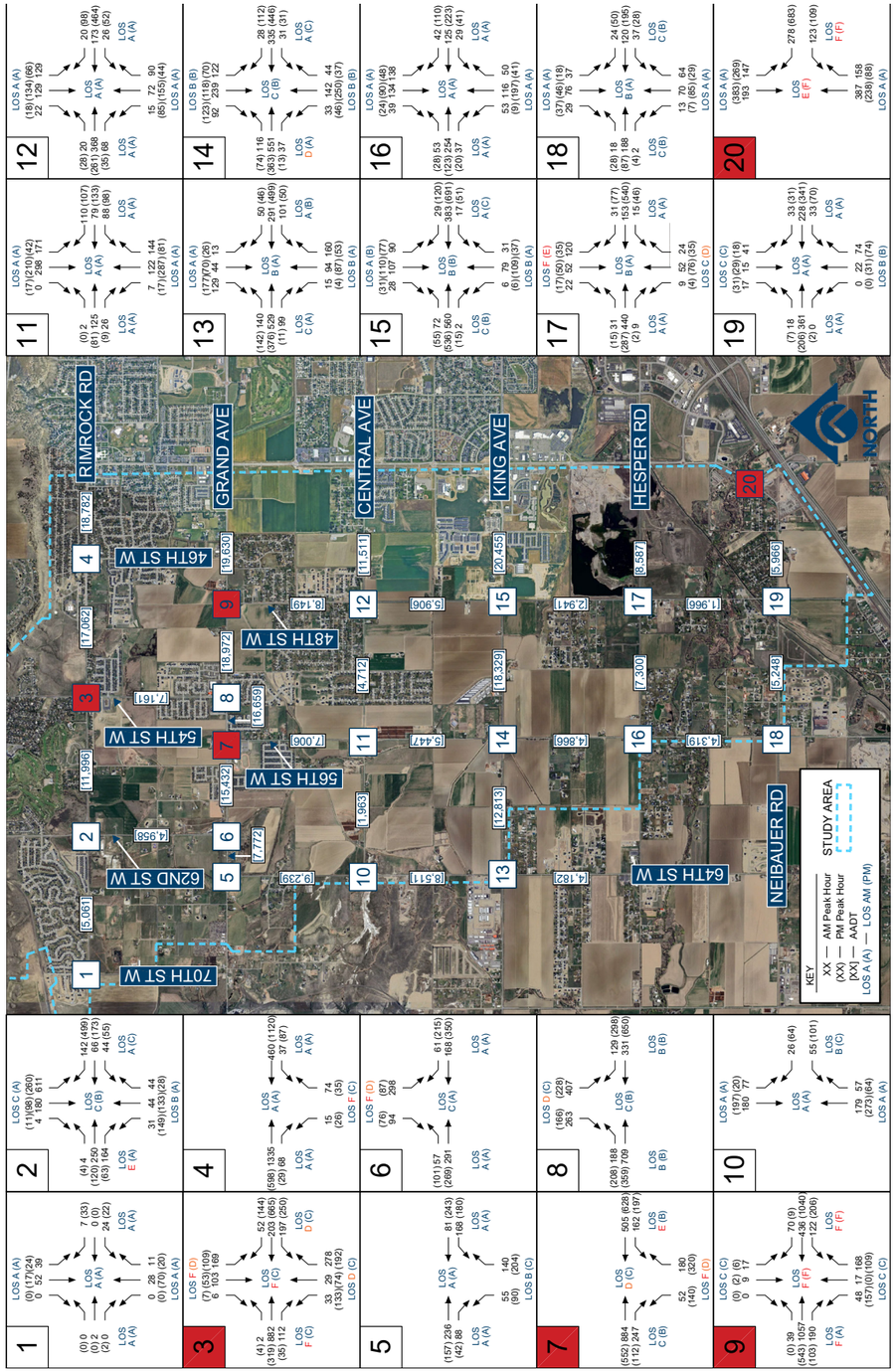

Figure 5.8: Future (2044) Traffic Volumes

Corridor Traffic Operations

Sanbell reassessed corridor level of service (LOS) for all arterial streets within the study area. As noted previously, LOS D is the minimum acceptable corridor performance threshold for this planning study. In addition to peak-hour intersection analysis, the Project Team evaluated daily corridor LOS to identify potential capacity issues and determine whether roadway widening, or other improvements may be needed.

Future (2044) corridor capacity calculations assumed completion of the planned transportation projects in the study area, including:

- Grand Avenue (43rd St W to 62nd St W)
- Rimrock Road (Clearview Dr to 62nd St W)
- 54th Street West (Rimrock Rd to Grand Ave)

Future (2044) AADTs were developed using the Future Land Use Map (FLUM) and the Billings MPO's 3.1% average annual traffic growth rate.

As illustrated in Figure 5.9, most corridors are projected to operate at LOS D or better. However:

- Rimrock Road is expected to operate at LOS E between 54th St W and 46th St W, and LOS F east of 46th St W.
- King Avenue is projected to operate at LOS F east of 56th St W and to be oversaturated between 56th St W and Shiloh Road, with volume-to-capacity ratios exceeding 1.0—conditions typically associated with long delays, queuing, and reduced travel speeds.

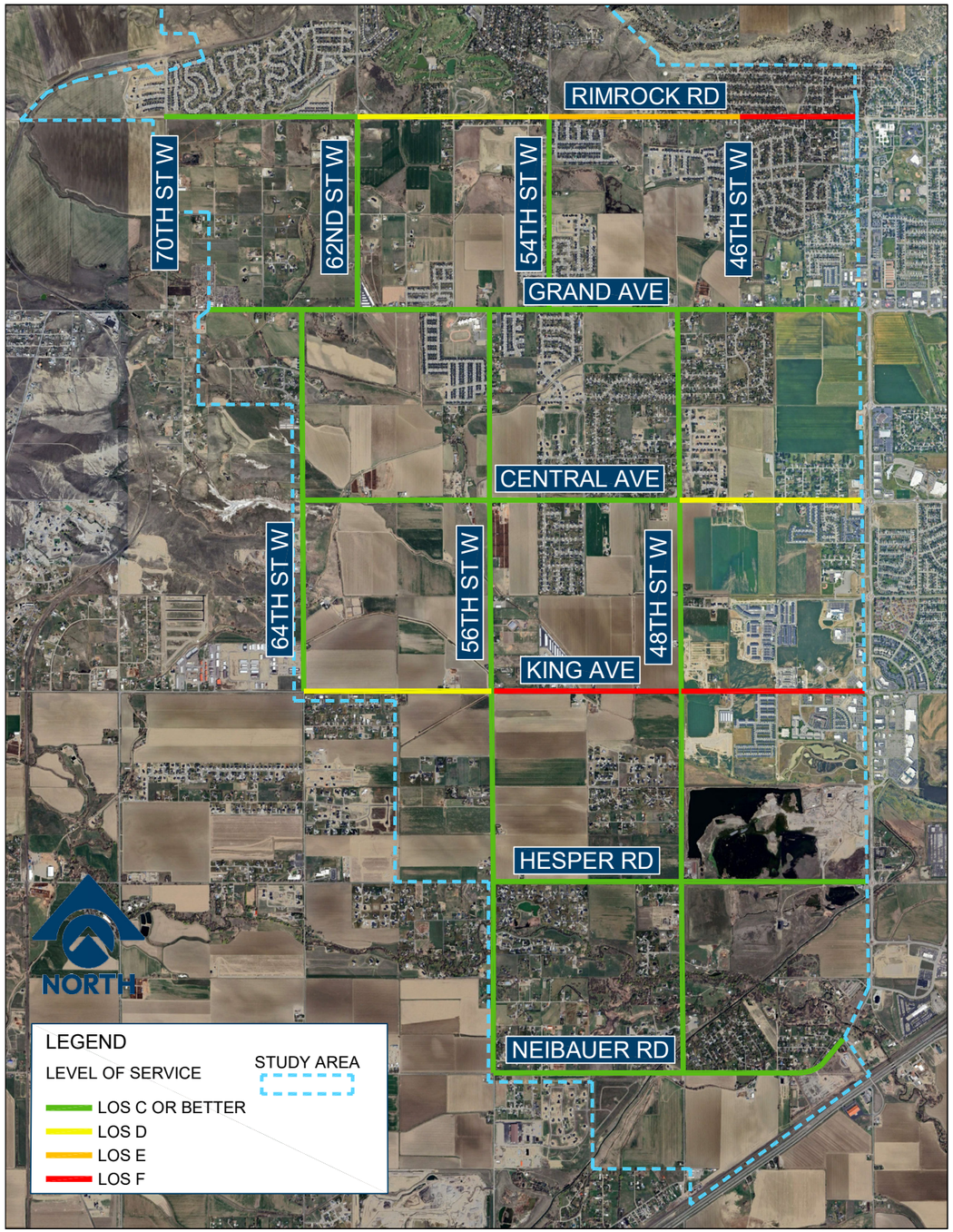

Figure 5.9: Future (2044) Corridor Level of Service (LOS)

Active Transportation Modeling

Instead of estimating the exact volume of bicycle and pedestrian activity, Sanbell used a methodology that identifies the relative demand for walking and biking within the study area. The Latent Demand Model evaluates economic, demographic, land use, and built environment factors to pinpoint active transportation "hot spots" and offers a clear framework for prioritizing investment and planning efforts.

Latent Demand Variables

Active transportation—bicycling and walking—is influenced by several factors. This analysis incorporates both existing and newly developed GIS data from the FLUM that relate to walking and biking conditions. Variable weighting is informed by prior research and refined for this project using FLUM planning analyses and engineering judgment. Tables 5.9 and 5.10 summarize the selected variables and their associated scoring criteria.

Table 5.9 & 5.10: Latent Active Transportation Demand Variables & Scoring

Built Environment Factors	
Dwelling Unit Density (Dwelling Units/Acre)	Score (12 Maximum)
0.0 - 0.4	0.0
0.5 - 1.3	2.4
1.4 - 2.3	4.8
2.4 - 4.1	7.2
4.2 - 6.7	9.6
> 6.7	12.0
Employment Density (Jobs/Acre)	Score (12 Maximum)
0.0 - 0.1	0.0
0.2 - 0.3	2.4
0.4 - 0.6	4.8
0.7 - 1.0	7.2
1.1 - 1.9	9.6
> 1.9	12.0
Land Use Mix (Jobs/Dwelling Units)	Score (6 Maximum)
0.0 - 0.2	0.0
0.3 - 0.6	1.5
0.7 - 1.5	3.0
1.6 - 2.5	4.5
> 2.5	6.0

Proximity Factors	
Schools (Proximity in Feet)	Score (25 Maximum)
0 - 660	25
661 - 1320	23.75
1231 - 2640	21.25
2641 - 3960	12.5
3961 - 5280	2.5
> 5280	0
Parks (Proximity in Feet)	Score (20 Maximum)
0 - 660	20
661 - 1320	15
1231 - 2640	10
2641 - 3960	5
> 3960	0
Retail (Proximity in Feet)	Score (10 Maximum)
0	10
1 - 2640	5
> 2640	0
Trails (Proximity in Feet)	Score (15 Maximum)
0 - 1320	15
1321 - 2640	7.5
> 2640	0

Active Transportation Demand Analysis

The Latent Demand Model identifies locations where there is underlying demand for active transportation—areas where walking or bicycling would likely occur if supportive conditions were in place. These favorable conditions typically include the presence of sidewalks, shared-use paths, and dedicated bicycle facilities.

The demand analysis was developed using GIS layers representing existing and planned built environments. Socio-economic projections for a fully built scenario were derived from the FLUM, which was developed by Sanbell and approved by the City of Billings. Future retail and school locations were estimated using local land use plans, zoning information, and input from City staff.

Figure 5.10 presents the results of the analysis, with blue tones indicating lower-demand areas and red/orange tones highlighting areas with higher demand. Under the FLUM's fully built scenario, the northern portion of the study area is expected to exhibit the greatest demand for active transportation. Most areas north of King Avenue and east of 56th Street West are projected to generate higher levels of demand, with the strongest concentrations along Grand Avenue, King Avenue West, and near Shiloh Road. This pattern aligns with planned higher-density development in these locations. In contrast, much of the remaining study area shows minimal demand due to low-density residential patterns, limited commercial or employment destinations, and predominantly agricultural land uses.

Overall, the analysis indicates that investments in active transportation infrastructure should be prioritized in the northern and eastern parts of the study area.

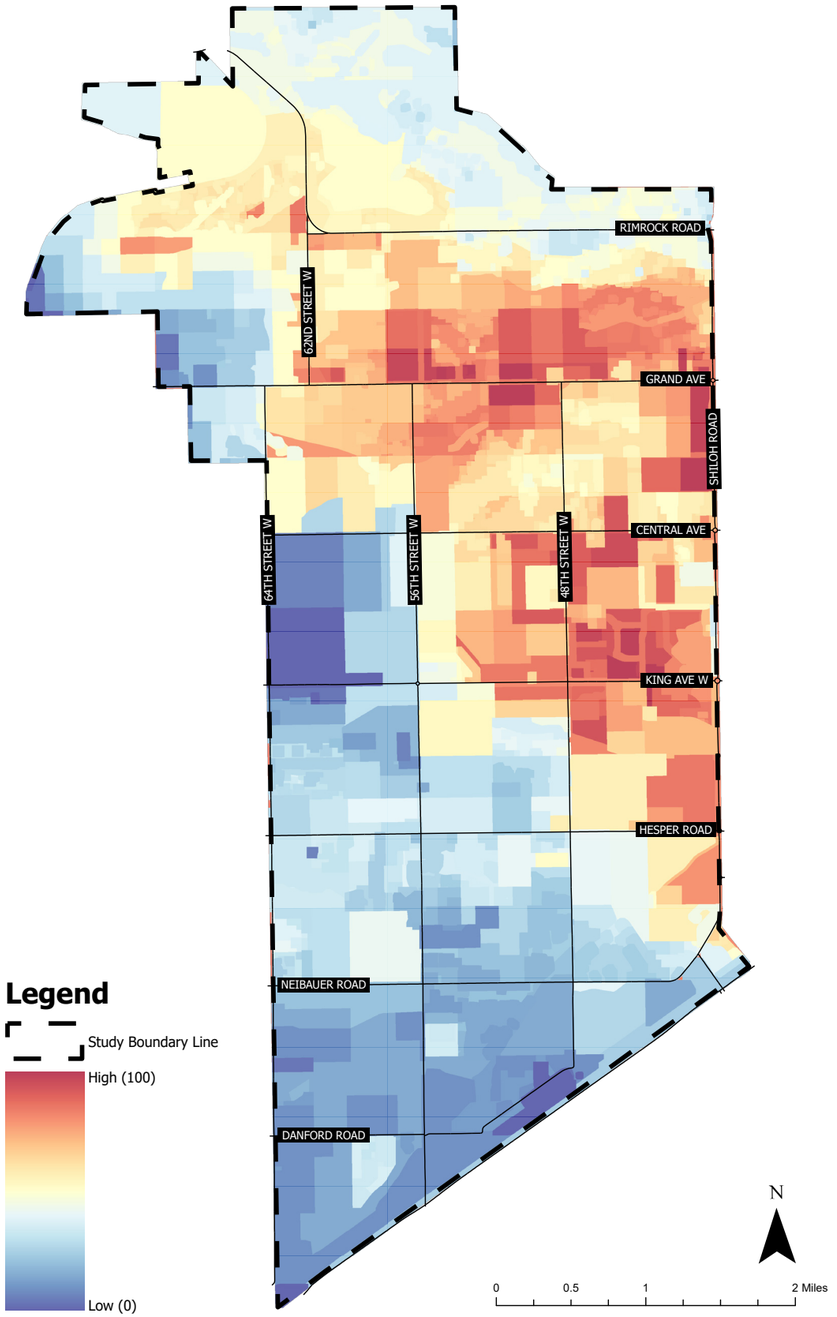

Figure 5.10 FLUM Full Built- Active Transportation Latent Demand Heat Map

Recommended Network Improvements and Mitigation Strategies

The previous section of this report identified the major study area intersections, street corridors, and active transportation facilities that are anticipated to need improvement or expansion to accommodate projected traffic demands under the Future (2044) growth scenario. This section presents recommended improvements along with mitigation alternatives to address the identified deficiencies. It also provides a summary of the analysis results for each alternative, illustrating the relative effectiveness of the proposed measures in meeting future transportation needs.

Intersections

Based on the intersection LOS deficiencies identified for the Future (2044) scenario, Sanbell evaluated a range of mitigation measures and recommended improvements to address those deficiencies. The purpose of this evaluation was to identify the minimum level of enhancement needed for each intersection to achieve an acceptable LOS C. The Project Team did not assess MUTCD Traffic Signal Warrants; instead, the analysis focused solely on operational performance.

The Future (2044) scenario was analyzed under an "improved" condition that applies recommended changes to intersection traffic control and lane configurations, along with any necessary mitigation strategies, to meet LOS objectives. Sensitivity analyses were performed using Synchro (Version 12) for stop-controlled and signalized intersections and Sidra (Version 10) for roundabout alternatives. Table 5.11 presents the results of the Future (2044) peak hour intersection capacity analysis for this "improved" condition.

Where signalization was identified as necessary to achieve acceptable performance, a roundabout option was also evaluated as both a mitigation strategy and a potential recommended alternative to a traffic signal. Results for each comparison are included in Table 5.11. Detailed capacity analysis worksheets for all improved alternatives under the Future (2044) scenario are provided in Appendix G.

54th Street West/Rimrock Road

The analysis indicates that the existing configuration at the 54th Street West and Rimrock Road intersection will not adequately accommodate Future (2044) traffic volumes, particularly during the AM peak hour. To address these deficiencies, several improvement strategies are recommended.

Recommended Improvements and Mitigation Activities/Alternatives:

Signalized Intersection Improvements:

Mitigation action:

- To maintain acceptable operations under future conditions, the signalized intersection would require an added eastbound shared through/right-turn lane

Mitigation benefits and considerations:

- This improvement is expected to reduce average eastbound delay by approximately 65% and lower overall intersection delay by 50% during the AM peak period

Outcomes:

- Despite these benefits, all approaches and the overall intersection would still operate at LOS D, indicating continued but manageable congestion

Roundabout Alternative:

Mitigation action:

- A multi-lane roundabout

Figure 5.11: Future (2044) Intersection Capacity Calculation Results - Mitigations

Intersection	Approach	Future (2044) with Improvements											
		AM Peak			PM Peak			AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized - EB Shared TR/RT Lane*						*Double-Lane Roundabout*					
54th Street West & Rimrock Road	EB	51.2	D	24	19.4	B	5	23.9	C	19	6.1	A	2
	WB	47.2	D	13	22.9	C	21	4.8	A	2	13.9	B	15
	NB	37.1	D	4	27.6	C	6	17.6	C	4	8.0	A	2
	SB	53.6	D	13	31.3	C	6	6.6	A	2	10.9	B	2
	Intersection	48.3	D	--	24.0	C	--	16.4	C	--	11.1	B	--
Intersection Control		*One-Way Stop-Control (NB) NB RT/LT Lanes*						*Single-Lane Roundabout - EB RT Slip Lane*					
46th Street West & Rimrock Road	EB	0.0	A	0	0.0	A	0	18.5	C	51	6.8	A	3
	WB	1.0	A	1	0.7	A	1	5.3	A	3	13.1	B	24
	NB	48.3	E	3	22.2	C	1	15.2	C	1	5.8	A	1
	Intersection	2.4	A	--	1.1	A	--	15.0	C	--	10.8	B	--
Intersection Control		*Signalized - EB LT & EB RT Lanes*						*Single-Lane Roundabout*					
62nd Street West & Grand Avenue	EB	10.1	B	5	6.7	A	4	6.9	A	2	5.3	A	2
	WB	8.4	A	3	6.2	A	5	4.4	A	1	7.1	A	3
	SB	10.9	B	8	11.8	B	3	6.3	A	2	5.2	A	1
	Intersection	10.0	B	--	7.2	A	--	6.1	A	--	6.2	A	--
Intersection Control		*Signalized - EB/WB LT, Thru, Shared RT/Thru, NB RT Lanes*						*Turbo Roundabout - 2 EB/WB Lanes*					
56th Street West & Grand Avenue	EB	22.3	C	13	19.2	B	7	11.3	B	10	7.1	A	3
	WB	12.6	B	7	11.1	B	6	5.9	A	3	7.8	A	4
	NB	23.0	C	2	22.3	C	4	13.1	B	2	11.3	B	4
	SB	0.0	A	0	0.0	A	0	4.7	A	0	5.7	A	0
	Intersection	19.2	B	--	16.5	B	--	9.7	A	--	8.3	A	--
Intersection Control		*Signalized - EB/WB LT, Thru, Shared RT/Thru Lanes*						*Turbo Roundabout - 2 EB/WB Lanes*					
48th Street West & Grand Avenue	EB	17.4	B	13	11.8	B	7	15.9	C	22	7.0	A	3
	WB	13.3	B	5	7.5	A	7	6.1	A	3	14.9	B	20
	NB	29.4	C	3	14.9	B	5	14.6	B	2	7.1	A	2
	SB	20.4	C	2	12.9	B	1	4.5	A	1	8.3	A	1
	Intersection	17.6	B	--	9.7	A	--	12.8	B	--	11.6	B	--
Intersection Control		*Signalized*						*Single-Lane Roundabout*					
48th Street West & Hesper Road	EB	8.6	A	10	4.9	A	4	7.9	A	3	5.2	A	2
	WB	6.4	A	4	7.6	A	15	4.5	A	1	8.1	A	4
	NB	10.4	B	2	14.7	B	3	6.6	A	1	4.7	A	1
	SB	11.6	B	5	14.3	B	3	4.7	A	1	6.2	A	1
	Intersection	8.9	A	--	8.1	A	--	6.4	A	--	6.9	A	--
Intersection Control		*Signalized - SB LT, NB RT & WB RT Slip Lanes*						*Single-Lane Roundabout*					
Autumn Lane & Neibauer Road & Shiloh Road	EB	0.0	A	0	0.0	A	0	4.4	A	0	5.6	A	0
	WB	16.3	B	4	16.0	B	6	9.9	A	3	15.0	C	13
	NB	11.2	B	14	13.4	B	10	8.6	A	4	6.7	A	2
	SB	12.1	B	7	9.9	A	8	6.2	A	2	8.3	A	4
	Intersection	12.1	B	--	11.8	B	--	8.4	A	--	11.0	B	--
Intersection Control		*Roundabout - EB RT Slip Lane*						*No Alternative Analysis Required*					
62nd Street West & Rimrock Road	EB	10.5	B	3	4.7	A	1						
	WB	5.4	A	2	18.6	C	16						
	NB	13.5	B	2	8.2	A	2						
	SB	14.7	B	14	9.2	A	3						
	Intersection	12.0	B	--	12.8	B	--						
Intersection Control		*Roundabout - EB RT Slip Lane*						*No Alternative Analysis Required*					
56th Street West & King Avenue	EB	19.0	C	13	7.4	A	3						
	WB	9.2	A	3	16.2	C	10						
	NB	14.4	B	3	10.9	B	3						
	SB	12.3	B	5	10.4	B	3						
	Intersection	14.6	B	--	11.7	B	--						

configuration—featuring dual entering and exiting lanes on all approaches—would provide the highest operational benefit

Mitigation benefits and considerations:

- Projected delay reductions include an 84% decrease during the AM peak hour and a 57% decrease during the PM peak hour

Outcomes:

- This alternative offers substantial performance improvements and addresses long-term capacity needs more effectively than a signalized layout

Supportive Network Mitigation:

Mitigation action:

- Construct a dedicated eastbound right-turn lane at the Rimrock Road and 54th Street West intersection

Mitigation benefits and considerations:

- The right turn lane will facilitate traffic redistribution by improving access to Grand Avenue, which will be able to accommodate the additional demand after the corridor is reconstructed as planned.

Outcomes:

- Enhanced access encourages drivers to use Grand Avenue as an alternate route, helping reduce congestion east of the study area

Summary:

Sanbell is currently under contract with the City of Billings to redesign the intersection as part of the Rimrock Road Improvements Project (54th Street West to 62nd Street West). Funding for design and construction has been planned in the City's 2026 Capital Improvements Plan (CIP). These programmed improvements serve as the primary mitigation steps toward addressing long-term operational needs at the intersection.

48th Street West/Grand Avenue

Future (2044) traffic projections show that the existing traffic signal at the 48th Street West and Grand Avenue intersection will fail without significant improvements. Several mitigation strategies are recommended to support acceptable operations and to complement planned upgrades along the Grand Avenue corridor.

Recommended Improvements and Mitigation Activities/Alternatives:

Upgrade the Traffic Signal with Auxiliary Turn Lanes:

To achieve acceptable levels of service, the signalized intersection should be upgraded with additional turn lanes.

Mitigation Actions:

- Add auxiliary left-turn lanes on both the eastbound and westbound approaches
- Provide dedicated through lanes on the eastbound and westbound approaches

Mitigation Benefits:

- LOS C or better for all approaches in both peak periods
- Maximum 95th-percentile queue of 13 vehicles (eastbound AM)
- Intersection average delay reduced by up to 80% (AM) and 96% (PM)

Outcome:

- This configuration provides substantial operational improvement and restores acceptable performance

Consider a Turbo Roundabout:

Mitigation action:

- Installation of a turbo roundabout

Mitigation Benefits and considerations:

- Operational performance similar to the signalized upgrade
- Improved circulation for turning movements
- Longer projected queues on the major road (up to 22 vehicles eastbound AM and 20 vehicles westbound PM)

Outcome:

- While functional, the roundabout alternative may introduce higher queueing on Grand Avenue and creates trade-offs

Widen Grand Avenue

Mitigation action:

- Widen Grand Avenue to a five-lane section at this location to support either intersection control option

Mitigation benefits:

- Reduction in average approaches delay by up to 87%
- Reduction in overall intersection delay by up to 96% during the PM peak hour

Outcome:

- These improvements provide the necessary capacity to meet Future (2044) traffic demands

Summary :

To ensure long-term operational effectiveness, the City should:

1. Pursue signal upgrades or evaluate a turbo roundabout, comparing their operational performance and corridor compatibility.
2. Include widening of Grand Avenue to five lanes at this intersection as a key supporting mitigation measure.
3. Coordinate intersection improvements with the broader Grand Avenue corridor project to maintain consistent operations.

62nd Street West/Grand Avenue

Future (2044) traffic projections indicate that the current traffic control at the 62nd Street West and Grand Avenue intersection will not accommodate expected southbound demand and would fail without improvements. Several mitigation strategies are recommended to ensure acceptable long-term operations.

Recommended Improvements and Mitigation Activities/Alternatives:

Signal and turn lanes

Mitigation action:

- Installation of signalized intersection with added turn lanes is recommended as a primary mitigation option
- Add an eastbound auxiliary left-turn lane
- Add a westbound auxiliary right-turn lane

Mitigation benefits and considerations:

- Intersection operates efficiently under Future (2044) AM and PM peak volumes 95th percentile queues remain under 10 vehicles in both peak periods Southbound delay reduced by nearly 80% during the AM peak hour

Outcome:

- This treatment provides reliable performance with manageable queuing

Roundabout

Mitigation action:

- Installation of a single-lane roundabout is a viable alternative that would also offer strong operational performance

Mitigation benefits and considerations:

- Minimal queuing during AM and PM peak surges
- Southbound average delay reduced by approximately 88% during the AM peak hour

Outcome:

- Comparable or slightly better operational results than a signalized option, particularly for southbound movements

Summary:

Although both alternatives provide substantial operational improvements, their physical footprints differ, and right-of-way needs should be evaluated prior to final selection. This will ensure that the selected control method aligns with site constraints and minimizes impacts to adjacent properties.

48th Street West/Central Avenue

Future (2044) traffic projections indicate that the existing stop-controlled intersection at 48th Street West and Central Avenue will operate at unacceptable levels, particularly during the PM peak hour. To address these deficiencies, several improvements are planned, and additional mitigation actions are recommended. Sanbell is currently under contract with Yellowstone County to redesign the intersection; funding for design and construction has been programmed in the County's 2026 budget.

Recommended Improvements and Mitigation Activities/Alternatives:

Traffic signal with Auxiliary Turn Lanes:

Mitigation actions:

- Install a traffic signal
- Add auxiliary left-turn lanes on the major approaches

Mitigation Benefits:

- Provides LOS B or better during both peak periods
- Produces manageable 95th-percentile queues

Outcome:

- This improvement would significantly enhance traffic flow and ensure acceptable long-term operations

Summary:

Given the projected substandard operations, a traffic signal is recommended as the primary mitigation measure. A traffic signal with auxiliary left-turn lanes should be constructed at the 48th Street West and Central Avenue intersection to mitigate future congestion and maintain acceptable operations under 2044 traffic volumes. Yellowstone County's programmed activities position the project for timely implementation and support the recommended signal installation.

Autumn Lane/Neibauer Road/Shiloh Road

Future (2044) traffic projections indicate that the Autumn Lane, Neibauer Road, and Shiloh Road intersection will fail under its existing one-way stop-controlled configuration and will require substantial improvements to achieve acceptable operations .

Recommended Improvements and Mitigation Activities/Alternatives:

Signal and turn lanes

Mitigation action:

- Installation of a traffic signal
- Installation of auxiliary turn lanes, including:
  - A southbound left-turn lane
  - A northbound right-turn lane
  - A westbound right-turn bypass (slip) lane

Mitigation benefits and considerations:

- LOS B or better during both peak periods
- Maximum 95th-percentile queue of 14 vehicles (AM peak)
- Over 90% reduction in westbound approach delay
- 97% reduction in overall intersection delay during the PM peak

Outcome:

- A traffic signal would significantly improve operations, provided that auxiliary lanes are added to accommodate turning movements
- Provides substantial performance improvement while maintaining compatibility with adjacent corridor operations

Roundabout

Mitigation action:

- Single-Lane Roundabout

Mitigation benefits and considerations:

- LOS C or better on all approaches during both peak hours

- Reduces overall intersection delay by 97% during the PM peak
- Reduces westbound approach delay by more than 90%
- May require additional right-of-way, which should be evaluated during design

Outcome:

- Delivers strong operational benefits with consistent and predictable traffic flow

Summary:

Given existing PM peak congestion and future failure of the current configuration, construct either a traffic signal with auxiliary turn lanes or a single-lane roundabout, based on right-of-way needs, constructability, and cost. Both would provide excellent operational performance under 2044 traffic volumes.

56th Street West/Grand Avenue

Future (2044) traffic projections show that the existing configuration at the 56th Street West and Grand Avenue intersection will not operate acceptably without improvements. Several mitigation strategies have been identified to address anticipated congestion and support the planned Grand Avenue reconstruction.

Recommended Improvements and Mitigation Activities/Alternatives:

Traffic signal and roadway reconstruction

Mitigation action:

- Implementation of a Traffic Signal with Auxiliary Turn Lanes (Planned Improvement). The City of Billings intends to install a traffic signal at this intersection as part of the Grand Avenue – 43rd Street West to 62nd Street West reconstruction project
- Add an auxiliary right-turn lane on the northbound approach
- Provide additional dedicated through lanes on the eastbound and westbound approaches
- Widen Grand Avenue to a five-lane section to meet operational needs

Mitigation benefits and considerations:

- LOS C or better on all approaches during both peak hours
- iMaximum 95th-percentile queue of 13 vehicles (eastbound AM)
- Up to 60% reduction in overall average delay
- 82% reduction in westbound approach delay during the AM peak

Outcome:

- With the 5-lane widening, signalization, and turn lanes, the configuration provides reliable and efficient operations under Future (2044) conditions.

Turbo Roundabout

Mitigation action:

- A turbo roundabout with two circulating lanes on the eastbound and westbound approaches may offer additional benefits

Mitigation benefits and considerations:

- Lower delays than the signalized alternative
- Shorter queues during both AM and PM peak periods
- Improved traffic flow on all approaches

Outcome:

- This option may provide superior operational performance but must be evaluated in the context of corridor coordination needs.

Signal Coordination

Mitigation action:

- Coordination of operations with adjacent signals. The intersection must operate cohesively with the planned traffic signal at Grand Avenue and 54th Street West
- Evaluate corridor-wide signal timing and spacing needs before selecting a preferred intersection control option

Mitigation benefits and considerations:

- Ensures that the selected treatment supports the overall performance of the Grand Avenue corridor

Summary:

Both alternatives require additional roadway footprint, with the magnitude of impacts varying by design. The City should conduct a right-of-way and cost assessment to determine the most feasible long-term solution.

62nd Street West/Rimrock Road

While the overall intersection is expected to function at an acceptable LOS with the recently constructed single-lane roundabout, the eastbound approach is projected to operate at LOS E during the AM peak hour due to conflicting high southbound volumes.

Recommended Improvements and Mitigation Activities/Alternatives:

Slip Lane

Mitigation action:

- An eastbound right-turn slip lane at this roundabout is recommended to enhance operations under Future (2044) traffic volumes

Mitigation benefits and considerations:

- Would allow right-turning vehicles to bypass the heavy southbound left-turn demand

Outcomes:

- Reduction of the average delay on the eastbound approach by approximately 74 percent during the AM peak hour

Summary:

With additional development anticipated in the area, implementing this slip lane is recommended to maintain acceptable operations and mitigate future congestion on the eastbound approach.

56th Street West/King Avenue

The existing single-lane roundabout at this intersection is projected to operate LOS D at

the eastbound approach with Future (2044) volumes during the AM peak hour.

Recommended Improvements and Mitigation Activities/Alternatives:

Slip Lane

Mitigation action:

- An eastbound right-turn slip lane

Mitigation benefits and considerations:

- Would allow right turning vehicles to bypass the heavy southbound through and left-turn demand

Outcomes:

- Reduction of the average delay at the eastbound approach by 40 percent in the AM peak hour

Summary:

This intersection is expected to operate with acceptable LOS under Future (2044) traffic volumes with the existing single-lane roundabout configuration. However, the eastbound approach is projected to operate at LOS D during the AM peak period. It is recommended that traffic continues to be monitored at this intersection to determine whether a right- turn slip lane is needed.

46th Street West/ Rimrock Road

The Future (2044) traffic analysis indicates that heavy eastbound through volumes on Rimrock Road will result in very limited gaps for northbound vehicles entering the corridor. Several improvement strategies are recommended to mitigate these projected operational challenges.

Recommended Improvements and Mitigation Activities/Alternatives:

Dedicated turn lanes

Mitigation action:

- Add Dedicated Northbound Left- and Right-Turn Lanes

Mitigation Benefits and considerations:

- These lanes would help relieve pressure created by continuous eastbound traffic and reduce average northbound approach delay by more than 20%

Outcome:

- This improvement provides near-term relief but may not fully address long-term operational needs as traffic demands continue to increase

Roundabout

Mitigation Action:

- Evaluate a Single-Lane Roundabout: A single-lane roundabout would further enhance northbound access to Rimrock Road.

Mitigation benefits and considerations:

- Reduction of average northbound delay by approximately 75% during peak hours, greatly improving access

Outcome:

- While beneficial to the northbound approach, a roundabout would reduce overall intersection LOS from A to C during the AM peak hour, requiring careful weighing of trade-offs between movement-specific and systemwide performance

Summary:

Under projected 2044 volumes, even with dedicated turn lanes, northbound operations remain constrained due to the dominance of eastbound traffic. The intersection should be monitored over time to track changes in volumes and delays. If operational conditions deteriorate, signalization may be needed to provide controlled access for northbound drivers and maintain acceptable levels of service.

48th Street West/Hesper Road

Future (2044) traffic projections show that high volumes along Hesper Road will limit opportunities for minor-road drivers to enter the intersection at 48th Street West. Although minor-road queues are expected to remain relatively short, several mitigation options would improve overall operations and reduce delays.

Recommended Improvements and Mitigation Activities/Alternatives:

Traffic Signal:

Mitigation action:

- Installation of a traffic signal without the need for auxiliary turn lanes

Mitigation benefits and considerations:

- LOS B or better during both peak hours
- Reduces southbound average delay by approximately 80%
- Manageable 95th-percentile queues, with a maximum of 15 vehicles during the PM peak on the major approaches

Outcome:

- Provides reliable control and improved access for minor-road drivers under future demand.

Roundabout:

Mitigation action:

- A single-lane roundabout would also function well at this location.

Mitigation benefits and considerations:

- LOS A on all approaches throughout the day
- Smooth traffic flow and low delay for all movements

Outcome:

- Offers excellent performance, comparable to the signal option, with consistently high levels of service

Summary:

Although both a traffic signal and a roundabout would effectively serve the intersection under 2044 conditions, immediate changes may not be necessary. This intersection should continue to be monitored for traffic volumes, delay patterns, and queue lengths over time to determine when an upgrade becomes warranted. This will ensures a data-driven decision on future traffic control, allowing improvements to be implemented when operational needs justify them.

Corridors

Several major streets within the study area are projected to operate below the acceptable Level of Service (LOS D) in the Future (2044) scenario. This section stratifies those corridors into individual segments and identifies potential mitigation strategies to address corridor capacity deficiencies.

To quantify the benefit of adding two-way left-turn lanes (TWLTL) or auxiliary left-turn lanes, the project team assumed an added capacity of 3,600 vehicles per day—equivalent to a 20 percent increase in capacity for a typical two-lane principal arterial. For a five-lane cross section, the same 3,600-vehicle capacity increase was applied by converting additional lanes using a factor of 0.2. The added capacity of the center turn lane remains consistent whether applied to a three-lane or five-lane section.

Figure 5.9 illustrates projected corridor LOS conditions for the Future (2044) scenario, and Table 5.12 demonstrates how center turn lanes or additional through lanes improve the volume-to-capacity (V/C) ratio and, in some cases, the overall LOS.

Key Findings and Recommended Mitigation

King Avenue West Corridor

Future (2044) traffic projections indicate that the existing two-lane configuration of King Avenue West will fail to provide adequate capacity east of 56th Street West without improvements. Several mitigation strategies are recommended to support acceptable operations.

Recommended Improvements and Mitigation Activities/Alternatives:

Corridor widening

Mitigation action:

- Corridor widening to a four-lane or five-lane section

Mitigation benefits and considerations:

- LOS C or better

Outcome:

- Additional lanes would significantly improve operations
- Additional capacity would allow for the redistribution of traffic through the network

Summary:

Given the projected failure of the current configuration, widen the corridor to either a four- or five-lane section, based on right-of-way needs, constructability, and cost. Both would provide acceptable operational performance under 2044 traffic volumes and would allow for better redistribution of traffic volumes throughout the network.

Figure 5.12: Future (2044) Corridor Capacity Calculation Results - Mitigations

Segment	Future (2044) - Planned			Future (2044) - Mitigations		
	Lanes	V / C Ratio	LOS	Lanes	V / C Ratio	LOS
Rimrock Road - 54th Street West to 46th Street West	3	0.862	E	4	0.474	A-C
Rimrock Road - East of 46th Street West	3	0.949	F	4	0.522	A-C
King Avenue West - 56th Street West to 48th Street West	2	1.018	F	4	0.509	A-C
King Avenue West - East of 48th Street West	2	1.136	F	4	0.568	A-C

Grand Avenue Corridor

Grand Avenue is planned to be improved to arterial standards, with either a four- or five-lane section. Funding for design and construction improvements has been programmed in the City's 2027 Capital Improvements Plan.

Recommended Improvements and Mitigation Activities/Alternatives:

Corridor Widening

Mitigation action:

- Corridor widening to a five-lane section

Mitigation benefits and considerations:

- LOS C or better

Outcome:

- A five-lane section would significantly improve corridor and intersection operations
- Additional capacity would allow for the redistribution of traffic through the network

Summary:

Although a four-lane section would sufficiently serve the corridor under 2044 traffic volumes, a five-lane section would provide a better driving experience, especially near intersections. Additionally, a five-lane section would better distribute traffic throughout the network. Therefore, this corridor should be widened to a five-lane section.

Rimrock Road Corridor

Rimrock Road is planned to be improved to full arterial and complete streets standards with a three-lane section. Funding for design and construction improvements has been programmed in the City's 2027 Capital Improvements Plan. However, Rimrock Road is projected to operate at unacceptable conditions with this improvement alone.

Recommended Improvements and Mitigation Activities/Alternatives:

Traffic redistribution

Mitigation action:

- Redistribute traffic to other collectors and arterials

Mitigation benefits and considerations:

- North-south corridors are projected to have enough capacity to carry the volume shift
- East-west arterials are projected to be able to carry higher volumes, particularly after the expansion of Grand Avenue and King Avenue West
- LOS D or better

Outcome:

- Redistributing traffic volumes would significantly alleviate and improve operations of the Rimrock Road corridor and remove the need to expand Rimrock Road to a four-lane section.

Summary:

Right-of-way constraints limit the expansion of Rimrock Road to a four-lane section east of the project limits. This makes expanding Rimrock Road to a four- or five-lane section impractical. The corridor is projected to operate at LOS E or

worse with a three-lane section if no traffic is diverted under 2044 traffic volumes. After the expansion of Grand Avenue to a five-lane section and King Avenue West to a four-lane section, under 2044 traffic volumes, the two corridors could support roughly an additional 16,000 daily trips combined before operating in LOS E. The north-south corridors also have available capacity to help redistribute traffic throughout the network. All arterial and collectors would operate with LOS D or better if 20 percent of the 2044 projected traffic volumes for Rimrock Road are shifted to other corridors. North-south corridor should be monitored as traffic is shifted from Rimrock Road.

Access Management

The West Billings transportation system could be improved by a more robust implementation of access management on arterial roads.

Recommended Improvements and Mitigation Activities/Alternatives:

Access Management

Mitigation action:

Regulate public access to and from properties adjacent to arterial roads

Mitigation benefits and considerations:

- Reduce frequency and severity of crashes
- Help improve traffic operations

Outcomes:

- Safer transportation network
- Improved travel reliability

Summary:

Access management would help create a safer, more reliable transportation network in West Billings. Traffic congestion could also be improved by regulating access to main routes.

Corridor Connectivity

The existing West Billings network lacks collector connections, which forces drivers to rely primarily on the arterial road system.

Recommended Improvements and Mitigation Activities/Alternatives:

Create a connected network of collectors and local streets

Mitigation action:

- Create collector and local streets connections between subdivisions

Mitigation benefits and considerations:

- Help redistribute traffic
- Minimize the number of accesses to arterial roads

Outcomes:

- Allow drivers to rely on roads that aren't arterials and balance regional mobility
- Alleviate traffic on arterial roads

Summary:

Create collector and local street connections to provide a more balanced transportation network and help alleviate traffic on arterial roads. Figure 5.11 provides a graphical representation of the location and features associated with the priority street and intersection project recommendations from this study.

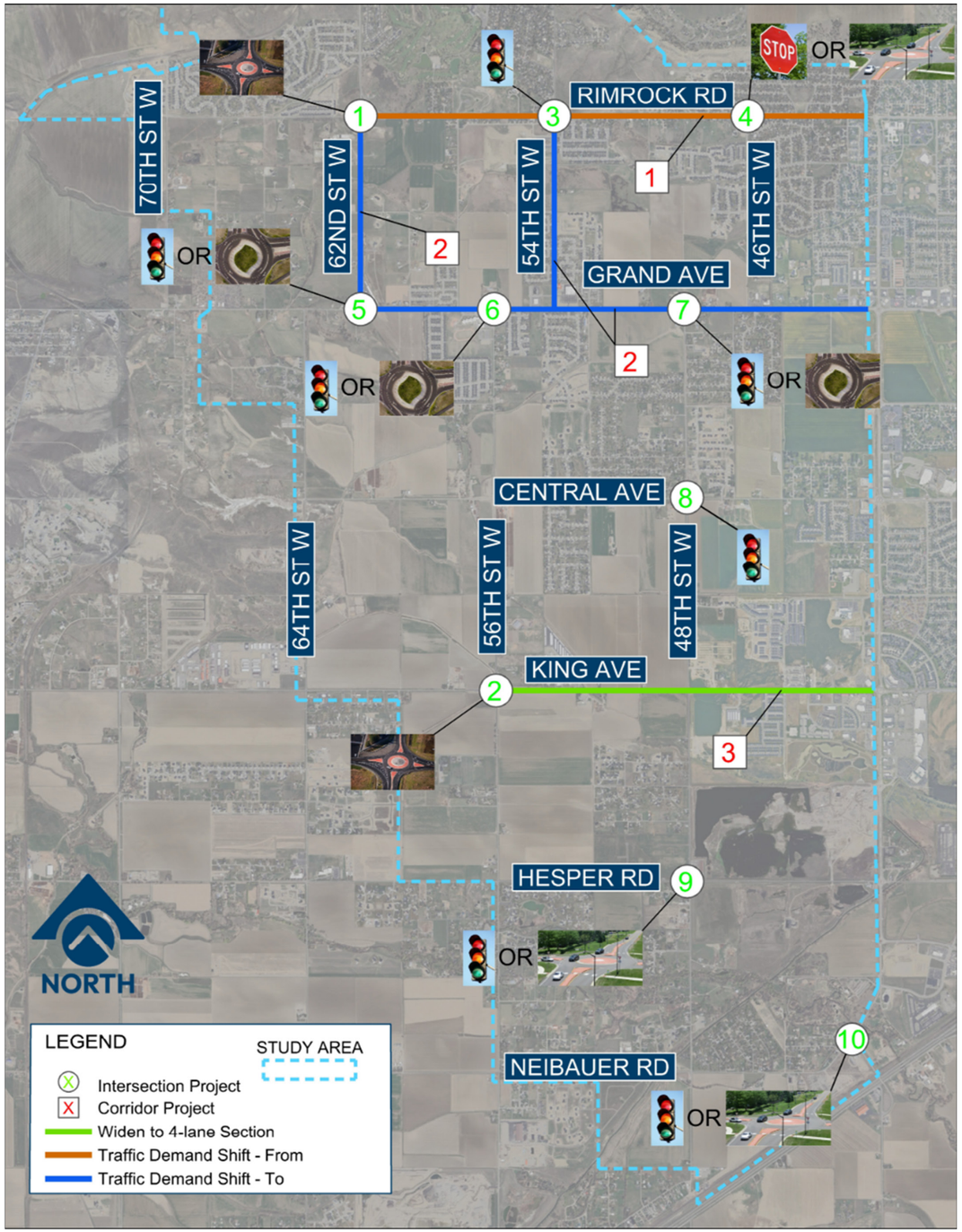

Figure 5.11: Street & Intersection Recommendations

Active Transportation Recommendations

The Existing Conditions (2024) and Future (2044) Level of Traffic Stress (LTS) analyses, combined with the Latent Demand Model, reveal a significant gap between projected active transportation demand and the availability of existing and planned facilities. The northeastern portion of the study area—particularly around Grand Avenue, King Avenue West, and Shiloh Road—shows the highest latent demand due to planned higher-density development and proximity to schools, commercial areas, and residential growth.

The Future (2044) LTS analysis indicates that most corridors within the study area will continue to operate at high stress levels for pedestrians and cyclists. High vehicle speeds, limited shoulders, and the absence of dedicated bicycle facilities will make these corridors inaccessible to most potential users unless substantial improvements are made.

Recommended Active Transportation Improvements

Prioritize Investment in High-Demand Areas

The Latent Demand Model provides a framework for directing infrastructure funding where it will have the greatest impact. Areas north of King Avenue West and east of 56th Street West are expected to generate the highest volumes of walking and biking trips and should be prioritized for improvements. Investments in these zones will support mode shift, enhance safety, and improve accessibility. Improvements, when located in City limits, should be consistent with the City of Billings Complete Streets standards and include sidewalks, side paths, protected bicycle facilities, and enhanced crossings. Improvements in the County should follow adopted subdivision regulations. While final facility locations will depend on subdivision design and FLUM-consistent land uses, the following recommendations identify improvements that should be incorporated into future development and capital projects.

Redesign Arterial Corridors to Reduce Traffic Stress

Most arterial corridors are projected to remain high-stress environments without substantial redesign. To make these roads usable for the broader public, complete street design elements must be implemented to achieve LTS 2 or better. This includes providing side paths or other forms of physical separation required under the City's Complete Streets policy. Planned reconstruction projects on Rimrock Road and Grand Avenue are expected to reduce stress to LTS 2, and similar design standards should be extended to remaining arterial corridors.

Develop a Connected Network of Low-Stress Streets

A functional active transportation system cannot rely solely on arterials. A connected network of collector and local streets—designed with multimodal considerations—is needed to provide safe alternatives to high-speed corridors. Such a network will allow users to move between neighborhoods, schools, parks, and commercial areas without entering high-stress environments and will help distribute traffic more evenly across the system. Future subdivisions should be required to maintain inter-neighborhood connectivity for active modes rather than relying exclusively on reconstructed arterial corridors.

Improve Arterial Road Crossings

High-volume, high-speed arterials often create significant barriers for pedestrians and cyclists. Although roundabouts and signals are planned at major intersection points, these locations are typically spaced a mile or more apart. As development patterns evolve, additional mid-block or intermediate crossings will be needed at intervals of roughly one-quarter mile. Enhanced treatments such as Pedestrian Hybrid Beacons, Rectangular Rapid Flashing Beacons, and refuge islands should be used to provide safe and frequent crossing options.

Integrate Active Transportation Requirements into Land Development Standards

To ensure that multimodal infrastructure keeps pace with growth, new developments should be required to incorporate active transportation facilities. Future land development should include:

- Installation of sidewalks and bicycle facilities within new subdivisions.
- Dedication of right-of-way for future multimodal corridors.
- Direct connections to existing and planned trail systems.

These strategies together will help close the gap between future demand and available facilities, creating a safer, more connected, and more accessible active transportation network for the study area.

City of Billings

The City of Billings has adopted a Complete Streets policy to ensure its transportation network safely and efficiently serves all users. This policy guides the design of roadways to accommodate pedestrians, cyclists, transit riders, and drivers.

Across all roadway types, Billings applies a consistent principle: every street project must consider the needs of all users from the outset. This approach creates a safer, more inclusive, and better-connected network citywide. All future intersection, corridor, and active transportation projects should continue to implement Complete Streets standards.

Note: The Complete Streets policy is specific to the City of Billings; it does not apply to transportation projects or facilities in Yellowstone County.

CHAPTER SIX

IMPLEMENTATION

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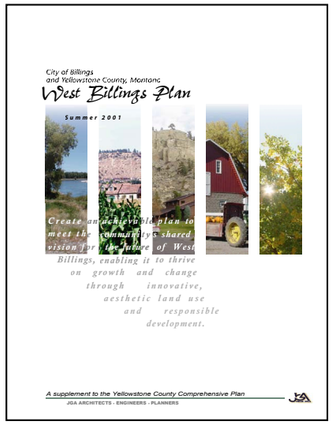
Overview

Implementation of the West Billings Neighborhood Plan will be guided by numerous influencing factors including state statute and existing local development regulations like zoning code, subdivision regulations, annexation policy and municipal approval processes. In the event of any inconsistencies between this plan and the city-wide, Billings 2045 plan, the Billings 2045 plan shall supersede this plan. Factors beyond the control of state and local governments will also contribute to the implementation of the West Billings Plan, including land use decisions of private landowners and economic market factors.

Land Use and Zoning Recommendations

The future land use map created by this plan will be integrated into the larger Billings 2045 plan future land use map which will be adopted as the City of Billings Future Land Use Plan, per requirements of the Montana Land Use Planning Act. The future land use categories established in this plan will be applied throughout the city and its projected 20-year growth area as part of the Billings 2045 plan. Should the future land use categories be amended as part of the Billings 2045 plan, the Billings 2045 plan shall prevail. The categories are based on existing zones that were adopted by the City of Billings and Yellowstone County during the 2020 Re:Code process.



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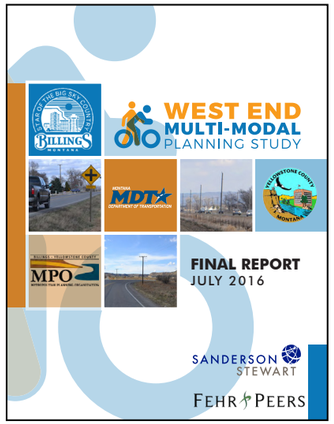

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NEIGHBORHOOD PLAN

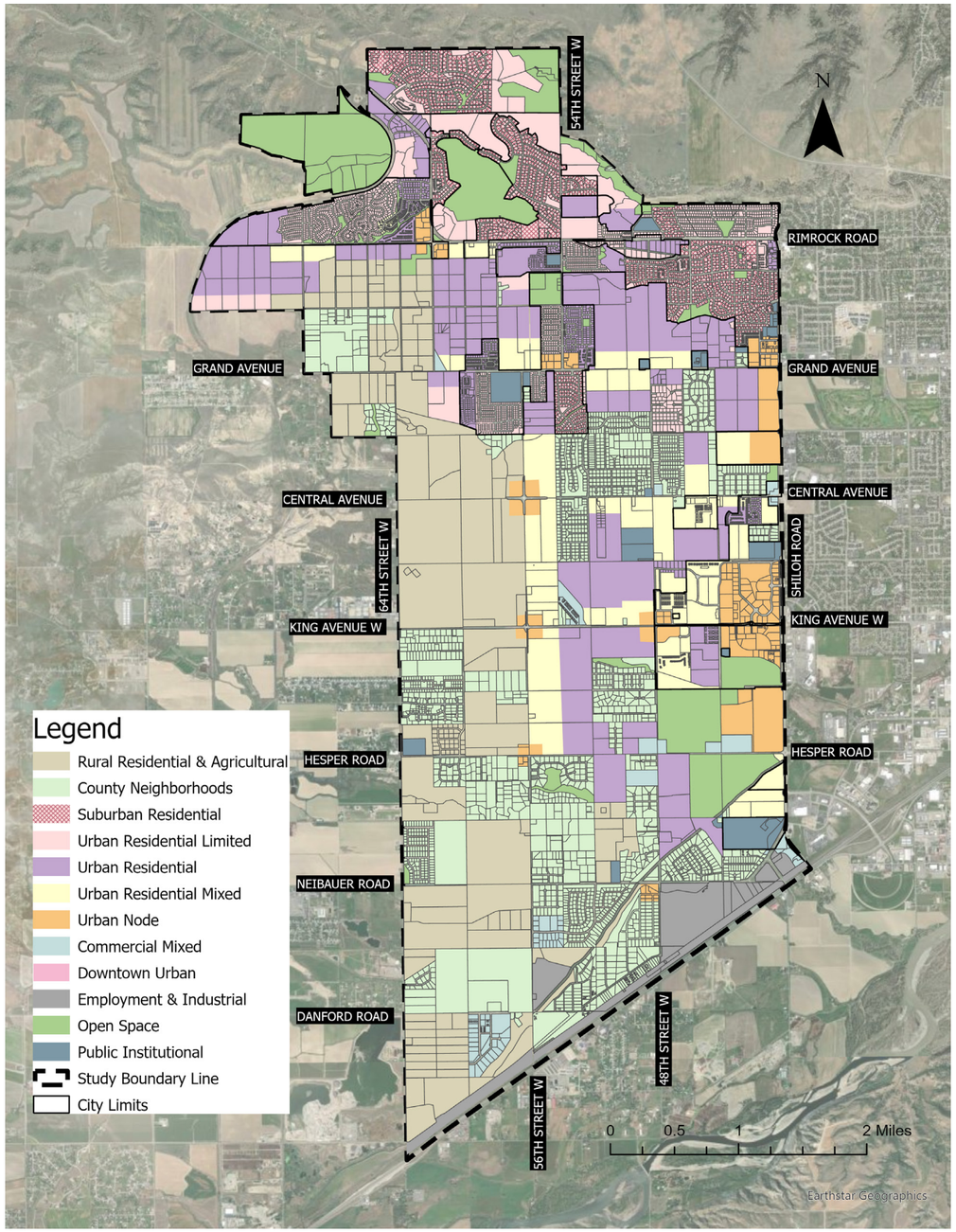

Figure 6.1 Future Land Use Map

Policy Recommendations

This plan and the Billings 2045 Future Land Use Plan will become what, before the Montana Land Use Planning Act, was referred to as Billings' Growth Policy. Therefore, all development approvals that require conformity with the Future Land Use Plan will be judged against the intent and metrics of the future land use map adopted by this Plan and the Billings 2045 Plan. Other policy documents like the City of Billings Subdivision Regulations, Annexation Policy, and Municipal Code will also guide development within the Plan Area.

Intergovernmental Cooperation

In practice, the future land use map established in this Plan only applies to land within the City of Billings zoning jurisdictional area. While County zoning exists and property are assigned future land uses these land uses only apply when annexed into the City.

During creation of this Plan, representatives of City of Billings, Yellowstone County, and local School Districts were included in the plan's steering committee and provided with weekly project updates. Members of the steering committee were given advanced opportunities to provide feedback on the future land use map, which was drawn to incorporate existing policy documents from each governmental entity.

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CHAPTER SEVEN

MONTANA LAND USE PLANNING ACT COMPLIANCE

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Introduction

In 2023 the Montana Legislature passed Senate Bill 382, the Montana Land Use Planning Act (MLUPA), and later amended it in 2025 through Senate Bill 121. The purpose of MLUPA is to coordinate and streamline planning and development review processes. It establishes that a Growth Policy, such as the City of Billings' 2016 Growth Policy will now be referred to as a Land Use Plan. MLUPA lists criteria for these plans and how they shall be adopted and amended in Part 2 of the statute.

This chapter documents how this plan, the West Billings Neighborhood Plan, as an update to the 2001 West Billings Plan, complies with section 76-25-201 of the Montana Land Use Planning Act.

76-25-201. Adoption or Amendment of Land Use Plan and Future Land Use Map

(1) The local governing body shall adopt or amend by resolution a land use plan and future land use map in accordance with this part only after consideration by and on the recommendation of the planning commission.

(2) Prior to making a recommendation to the governing body to adopt or amend a land use plan and future land use map, the planning commission shall:

(a) provide public notice and participation in accordance with 76-25-106; and

(b) (b) accept, consider, and respond to public comment on the proposed land use plan and future land use map. All public comment must be part of the administrative record transmitted to the governing body.

City/County staff completed all public meeting notices in accordance with section 76-25-106. Sanbell, in its capacity as consultant to Yellowstone County, posted materials presented during public and the City of Billings meetings on the project website. Public comment received in meetings, surveys and maps were analyzed and integrated into the plan document. Questions and comments received during public meetings were responded to by staff and consultants at that time. All comments received during the public input process are included in Appendix A.

(3) After meeting the requirements of subsection (2), the planning commission shall make a final recommendation to the governing body to adopt, modify, or reject the proposed land use plan and future land use map or any amendment to the proposed land use plan and future land use map.

(4) The governing body shall incorporate any existing neighborhood, area, or plans adopted pursuant to Title 76, chapter 1, that meet the requirements of this chapter into the land use plan and future land use map.

(5)

(a) The governing body shall consider the recommendation of the planning commission to adopt, modify, or reject the proposed land use plan and future land use map or any amendment to the proposed land use plan and future land use map.

(b) After providing public notice and participation in accordance with 76-25-106, the governing body may adopt, with any revisions the local governing body considers appropriate, or reject the land use plan and future land use map or any amendment to the proposed land use plan and future land use map proposed by the planning commission.

(6) An amendment to a land use plan or future land use map may be initiated:

(a) by majority vote of the governing body;

(b) on petition of at least 15% of the electors of the local government jurisdiction to which the plan applies, as registered at the last general election; or

(c) by a property owner applying for a zoning, subdivision, or other land use permit.

(7)

(a) After the initiation of an amendment to a land use plan or future land use map allowed in subsection (6), the planning commission shall make a preliminary determination of whether the proposed land use plan or future land use map amendment results in new or increased impacts to or from local facilities, services, natural resources, natural environment, or natural hazards from those previously described and analyzed in the assessment conducted in the development of the land use plan.

(b) If the planning commission finds new or increased impacts from the proposed land use plan or future land use map amendment, the local government shall collect additional data and conduct additional analysis necessary to provide the planning commission with the opportunity to consider all potential impacts resulting from the amendment before proceeding under subsection (2).

(8) The governing body may not amend the land use plan or future land use map unless:

(a) the amendment is found in substantial compliance with the land use plan; and

(b) the potential impacts resulting from development in substantial compliance with the proposed amendment have been made available for public review and comment and have been fully considered by the governing body.

The City of Billings City Council and the City Planning Commission will follow the statutory amendment adoption requirements set forth in 76-25-201.

The West Billings Neighborhood Plan Update was initiated by majority votes of Billings City Council and the Yellowstone Board of County Commissioners.

The themes of the West Billings Neighborhood Plan Update were directly adapted from the themes of the 2001 West Billings Plan and the goals of the 2016 City of Billings Growth Policy with input provided by members of the public, ensuring that the plan update is in substantial compliance with those documents. Adequate time for public review of this plan will be provided, and the City of Billings and Yellowstone County will follow statutory requirements regarding a complete review of this plan as part of the adoption process.

Analysis of natural resources, natural environment and natural hazards was

limited to inclusion of floodplain in future land use map drafting process.

76-25-202. Update of Land Use Plan or Future Land Use Map

(1) After a local government adopts a land use plan and future land use map in accordance with 76-25-201, the land use plan and future land use map must be reviewed by the planning commission every fifth year after adoption to determine whether an update to the land use plan and future land use map must be performed. The planning commission shall:

(a) make a preliminary determination regarding the existence of new or increased impacts to or from local facilities, services, natural resources, natural environment, or natural hazards from those previously described and analyzed when the land use plan and future land use map were previously adopted;

(b) provide public notice and participation in accordance with 76-25-106; and

(c) accept, consider, and respond to public comment on the review of the land use plan and future land use map. All public comment must be part of the administrative record transmitted to the governing body.

(2)

(a) If the planning commission finds new or increased impacts under subsection (1), the planning commission shall recommend an update to the land use plan, future land use map, or both.

(b) If the planning commission finds no new or increased impacts under subsection (1), the planning commission shall make a recommendation to the governing body that no update to the land use plan or future land use map is necessary.

(3) After receiving the recommendation of the planning commission, the governing body may direct that an update of the land use plan, future land use map, or both be completed or may readopt the current land use plan, future land use map, or both.

(4)

(a) In developing, drafting, and considering an update to the land use plan or future land use map, the planning commission shall follow the process set forth in 76-25-201 with respect to the changes proposed to the land use plan or future land use map.

(b) If the planning commission finds new or increased impacts resulting from the land use plan or future land use map, the local government shall collect additional data and conduct additional analysis necessary to provide the governing body and the public with the opportunity to comment on and consider all potential impacts resulting from an update to the land use plan or future land use map.

(5) At any time before an update is required after a review under subsection (1), the local governing body may direct that an update to the land use plan or future land use map be prepared for consideration by the planning commission and for recommendation to the governing body.

(6) Once an update to the land use plan or future land use map is adopted or the land use plan or future land use map is readopted, the information and analysis contained within the land use plan and future land use map must be considered accurate for the purposes of making site-specific development decisions in substantial compliance with the land use plan and future land use map.

The City of Billings City Council and the City Planning Commission will follow the statutory Land Use Plan and land Use Map update requirements set forth in 76-25-202.

The West Billings Neighborhood Plan will be reviewed in conjunction with the overall 5-year review cycle of the Land Use Plan and the subsequent creation of a community-wide future land use map.

76-25-203. Existing Conditions and Population Projections

(1) The land use plan must include, at a minimum, inventories and descriptions of existing conditions of housing, local services and facilities, economic development, natural resources, environment, and hazards, and land use within the jurisdictional boundaries of the land use plan.

(2) As set forth in 76-25-206 through 76-25-209 and 76-25-213 through 76-25-216, the land use plan must include, at minimum, a description, map, and analysis of how the jurisdiction will accommodate its projected population over the next 20 years and the expected impacts of the development in the areas of housing, local services and facilities, economic development, natural resources, environment, and hazards.

(3) The inventories and descriptions in the plan must be based on up-to-date surveys, maps, diagrams, charts, descriptive material, studies, and reports necessary to explain and supplement the analysis of each section of the land use plan.

(4)

(a) A jurisdiction shall use demographics provided by:

(i) the most recent decennial census or census estimate of the United States census bureau; and

(ii) population projections for a 20-year period based on permanent and seasonal population estimates: (A) provided by demographics published by the department of commerce; (B) generated by the local government; or (C) produced by a professional firm specializing in projections.

(b) When a population projection is not available, population projections for the jurisdiction must be reflective of the area's proportional share of the total county population and the total county population growth.

The West Billings Neighborhood Plan incorporates by reference the demographic information contained in the 2023 LRTP Billings Urban Area Long Range Transportation Plan. Details of demographic trends and housing demand projections used in this plan are included in Chapter 4, Future Land Use. Existing conditions of the plan area's land use, zoning, and public infrastructure were sourced from Yellowstone County GIS data. Analysis of natural resources, environment and hazards were not included in this plan and will be

analyzed as part of the overall Billings 2045 plan.

76-25-206. Housing

(1) A local governing body shall identify and analyze existing and projected housing needs for the projected population of the jurisdiction and provide regulations that allow for the rehabilitation, improvement, or development of the number of housing units needed, as identified in the land use plan and future land use map, including:

(a) a quantification of the jurisdiction's existing and projected needed housing types, including location, age, condition, and occupancy required to accommodate existing and estimated population projections;

(b) an inventory of sites, including zoned, unzoned, vacant, underutilized, and potential redevelopment sites, available to meet the jurisdiction's needed housing types;

(c) an analysis of any constraints to housing development, such as zoning, development standards, and infrastructure needs and capacity, and the identification of market-based incentives that may affect or encourage the development of needed housing types; and

(d) a detailed description of what actions the jurisdiction may take to accommodate the projected needed housing types identified in subsection (1)(a).

(2) The housing section of the land use plan and future land use map may incorporate by reference any information or policies identified in other housing needs assessments adopted by the governing body.

(3) If, after performing the analysis required in subsection (1), the local government determines that the total needed housing types may not be met due to lack of resources, development sites, infrastructure capacity, or other documented constraints, the local government shall establish the minimum number of housing units that may be rehabilitated, improved, or developed within the jurisdiction over the 20-year planning period and the actions the local government may take to remove constraints to the development of those units over that period.

(4) Progress toward the construction of the housing units identified as needed to meet projected housing needs during the 20-year planning period of the land use plan must be documented at each fifth year review of the land use plan as required in 76-25-202.

(5) The amount of detail provided in the analysis beyond the minimum criteria established in this section is at the discretion of the local governing body.

During production of the West Billings Neighborhood Plan several sources were referenced to assess the plan area's current housing inventory and future housing demand for the 2045 plan horizon. These sources include the 2023 LRTP Billings Urban Area Long Range Transportation Plan, the Billings-Yellowstone Metropolitan Planning Organization, the 2020 decennial Census, and the Montana Department of Commerce. A detailed explanation of the methods used to project population growth in the plan area is included in Chapter 4, Future Land Use. Recommendations for policy changes are included in Chapter 6, Implementation. The plan incorporates the themes and goals of the 2001 West Billings Plan and the 2016 City of Billings Growth Policy as they relate to housing choice and affordability.

76-25-207. Local Services and Facilities

(1) The land use plan must:

(a) determine the existing and anticipated levels of public safety and emergency services necessary to serve the projected population of the jurisdiction, including law enforcement, fire protection, emergency management system agencies, and local health care organizations;

(b) contain an inventory and map of existing fire protection, law enforcement, and emergency service jurisdictional areas and anticipated response times, a description of mutual aid or cooperative service agreements, and the location of hospitals or clinics in the jurisdiction;

(c) identify capital and service improvements for fire, law enforcement, emergency services, and health services for the jurisdictional area necessary to meet the projected population;

(d) determine the existing capacity, existing deficiencies, planned expansion, and anticipated levels of utility services necessary to serve the projected population in the jurisdiction, including water, wastewater, and storm water systems, solid waste disposal, and other utility services, as identified by the local government;

(e) contain an inventory and map of all utility service areas, system networks, and facilities;

(f) identify local utility capital and service improvements for the jurisdictional area necessary to meet the projected population;

(g) determine the existing capacity, existing deficiencies, planned expansion, and anticipated improvements to the transportation network serving the jurisdictional area necessary to serve the projected population in the jurisdiction;

(h) contain an inventory and classification map of all existing and planned roads within the jurisdictional area, including major highways, secondary highways, and local routes, all non-motorized routes, including bike lanes and pedestrian thoroughfares, and all public transit systems and facilities; and

(i) identify planned capital and service transportation improvements necessary to serve the projected population.

(2) The local government shall:

(a) coordinate with school districts within the jurisdiction to determine the existing capacity of, planned expansion of, and anticipated improvements necessary for the local K-12 school system to serve the projected population in the jurisdiction; and

(b) request that the local school district provide any inventory and maps of existing K-12 educational facilities within the jurisdictional area and identify any capital and service improvements necessary to meet the projected population.

(3) The local government may include an analysis of existing capacity and service levels, planned expansions of, and anticipated improvements necessary to provide other services to the projected population in the jurisdiction.

(4) The local government may incorporate by

reference any information or policies identified in other relevant local services or facilities assessments adopted by the local governing body, such as a capital improvements plan or an impact fee study.

(5) The amount of detail provided in the analysis beyond the minimum criteria established in this section is at the discretion of the local governing body.

The West Billings Neighborhood Plan incorporates, by reference, the local services and facilities analysis of the 2023 Billings Urban Area Long Range Transportation Plan (LRTP). Inventories of facilities like schools, roadways and utilities were also included for analysis in Chapter 34, Future Land Use. Future provision of transportation infrastructure is included in the Multi-modal Transportation Chapter 4 of this plan.

76-25-208. Economic Development

(1) The land use plan must:

(a) assess existing and potential commercial, industrial, small business, and institutional enterprises in the jurisdiction, including the types of sites and supporting services needed by the enterprises;

(b) summarize job composition and trends by industry sector, including existing labor force characteristics and future labor force requirements, for existing and potential enterprises in the jurisdiction;

(c) assess the extent to which local characteristics, assets, and resources support or constrain existing and potential enterprises, including access to transportation to market goods and services, and assess historic, cultural, and scenic resources and their relationship to private sector success in the jurisdiction;

(d) inventory sites within the jurisdiction, including zoned, unzoned, vacant, underutilized, and potentially redeveloped sites, available to meet the jurisdiction's economic development needs;

(e) assess the adequacy of existing and projected local facilities and services, schools, housing stock, and other land uses necessary to support existing and potential commercial, industrial, and institutional enterprises; and

(f) assess the financial feasibility of supporting anticipated economic growth in the jurisdiction.

(2) The local government may incorporate by reference any information or policies identified in other relevant economic development assessments.

(3) The amount of detail provided in the analysis beyond the minimum criteria established in this section is at the discretion of the local governing body.

The West Billings Neighborhood Plan incorporates, by reference, the economic development and commercial land use needs analysis of the 2023 Billings Urban Area Long Range Transportation Plan (LRTP). Analysis of job growth in the plan area is included in the existing conditions overview of in Chapter 1.

76-25-209. Natural Resources, Environment, and Hazards

(1) The land use plan must:

(a) include inventories and maps of natural resources within the jurisdiction, including but not limited to agricultural lands, agricultural water user facilities, minerals, sand and gravel resources, forestry lands, and other natural resources identified by the local government;

(b) describe the natural resource characteristics of the jurisdictional area, including a summary of historical natural resource utilization, data on existing utilization, and projected future trends;

(c) include an inventory, maps, and description of the natural environment of the jurisdictional area, including a summary of important natural features and the conditions of and real and potential threats to soils, geology, topography, vegetation, surface water, groundwater, aquifers, floodplains, scenic resources, wildlife, wildlife habitat, wildlife corridors, and wildlife nesting sites within the jurisdiction; and

(d) include maps of, identify factors related to, and describe natural hazards within the jurisdictional area, including flooding, fire, earthquakes, steep slopes and other known geologic hazards and other natural hazards identified by the jurisdiction, with a summary of past significant events resulting from natural hazards that includes:

(i) a description of land use constraints resulting from natural hazards;

(ii) a description of the efforts that have been taken within the local jurisdiction to mitigate the impact of natural hazards; and

(iii) a description of the role that natural resources and the environment play in the local economy.

(2) The local government may incorporate by reference any information or policies identified in other relevant assessments of natural resources, environment, or hazards.

(3) The amount of detail provided in the analysis beyond the minimum criteria established in this section is at the discretion of the local governing body.

The West Billings Neighborhood Plan incorporates, by reference, the environmental analysis of the 2023 Billings Urban Area Long Range Transportation Plan (LRTP) and the 2025 Yellowstone County Community Wildfire Protection Plan. Floodplain data provided by Yellowstone County was incorporated into production of the future land use map of the West Billings plan area. Further analysis of environmental constraints and hazards as well as natural resources will be completed as part of the Billings 2045 plan.

76-25-213. Land Use and Future Land Use Map

(1) A land use plan must include a future land use map and a written description of the proposed general distribution, location, and extent of residential, commercial, mixed, industrial, agricultural, recreational, and

conservation uses of land and other categories of public and private uses, as determined by the local government.

(2) The future land use map must reflect the anticipated and preferred pattern and intensities of development for the jurisdiction over the next 20 years, based on the information, analysis, and public input collected, considered, and relevant to the population projections for and economic development of the jurisdiction and the housing and local services needed to accommodate those projections, while acknowledging and addressing the natural resource, environment, and natural hazards of the jurisdiction.

(3) The future land use map may not confer any authority to regulate what is not otherwise specifically authorized in this chapter.

(4) The future land use map and the written description must include:

(a) a statement of intent describing the jurisdiction's applicable zoning, subdivision, and other land use regulations;

(b) descriptions of existing and future land uses, including:

(i) categories of public and private use;

(ii) general descriptions of use types and densities of those uses;

(iii) general descriptions of population; and

(iv) other aspects of the built environment;

(c) geographic distribution of future land uses in the jurisdiction, anticipated over a 20-year planning period that specifically demonstrate:

(i) adequate land to support the projected population in all land use types in areas where local services can be adequately and cost-effectively provided for that population;

(ii) adequate sites to accommodate the type and supply of housing needed for the projected population; and

(iii) areas of the jurisdiction that are not generally suitable for development and the reason, based on the constraints identified through the land use plan analysis;

(d) a statement acknowledging areas within the jurisdiction known to be subject to covenants, codes, and restrictions that may limit the type, density, or intensity of housing development projected in the future land use map; and

(e) areas of or adjacent to the jurisdiction subject to increased growth pressures, higher development densities, or other urban development influences.

(5) To the greatest extent possible, local governments shall create compatibility in the land use plans and future land use map in those areas identified in subsection (4)(e).

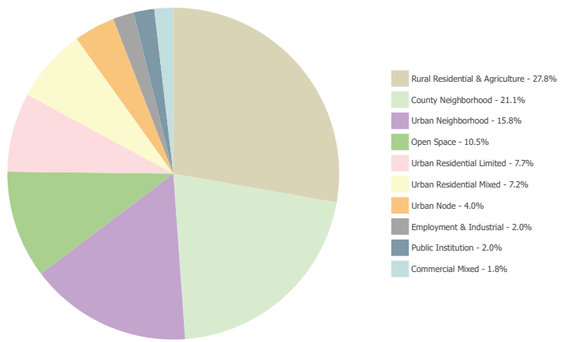

Figure 7.1 - Future Land Use Categories

(6)
The land use plan may:

(a) provide information required by a federal land management agency for the local governing body to establish or maintain coordination or cooperating agency status; and

(b) incorporate by reference any information or policies identified in other relevant assessments adopted by the local governing body, such as a pre-disaster mitigation plan or wildfire protection plan.

(7) The amount of detail provided in the analysis beyond the minimum criteria established in this section is at the discretion of the local governing body.

The West Billings Neighborhood Plan creates a future land use map for the West Billings plan area. The details of the methods of production, land use categories, and final map are included in Chapter 4 of this document: Future Land Use.

76-25-214. Area Plans

(1) A local governing body may adopt area plans for a portion of the jurisdiction to provide a more localized analysis of all or any part of a land use plan. An area plan may include but is not limited to a neighborhood plan, a corridor plan, or a subarea plan.

(2) The adoption, amendment, or update of an area plan must follow the same process as a land use plan provided for in this part and may be adopted as an amendment to the land use plan.

(3) The area plan must be in substantial compliance with the land use plan. To the extent an area plan is inconsistent with the land use plan, the land use plan controls.

Figure 7.2 - Themes to Principles

The West Billings Neighborhood Plan creates a future land use map for the West Billings plan area and will be adopted concurrently with the Billings 2045 plan, which will include a future land use map for the entirety of the Billings MPO jurisdiction. The West Billings Neighborhood Plan is built upon five themes adapted from the 2001 West Billings Plan, ensuring that the update is consistent with the previous area plan.

76-25-216. Implementation

(1) The land use plan and future land use map is not a regulatory document and must include an implementation section that:

(a) establishes meaningful and predictable implementation measures for the use and development of land within the jurisdiction based on the contents of the land use plan and future land use map;

(b) provides meaningful direction for the content of more detailed land use regulations and future land use maps; and

(c) requires identification of those programs, activities, actions, or land use regulations that may be part of the overall strategy of the jurisdiction for implementing the land use plan.

(2) The implementation section of the land use plan must include:

(a) if the local jurisdiction does not have current zoning regulations, a schedule by which zoning regulations and a zoning map will be adopted in accordance with the deadlines set forth in 76-25-105;

(b) if the local jurisdiction has current zoning regulations, an analysis of whether any inconsistencies exist between current zoning regulations and the land use plan and future land use map, including a map of the inconsistencies. If inconsistencies exist, the local government shall identify:

(i) specific implementation actions necessary to amend the zoning regulations and the zoning map to bring the zoning regulations and zoning map into substantial compliance with the land use plan and future land use map;

(ii) a schedule for amending the zoning regulations and zoning map to be in substantial compliance with the land use plan and future land use map, in accordance with the deadlines set forth in 76-25-105;

(iii) a schedule for adopting a capital improvements program or for amending an existing capital improvements program to be in substantial compliance with the land use plan and future land use map;

(iv) a schedule for expanding or replacing public facilities and the anticipated costs and revenue sources proposed to meet those costs, which must be reflected in a jurisdiction's capital improvement program;

(v) if applicable, a schedule for updating the plan for extension of services required in 7-2-4732 to be in substantial compliance with the land use plan; and

(vi) a schedule for implementing any other specific actions necessary to achieve the components of the land use plan, including a timeframe or prioritization of each specific public action; and

(c) procedures for monitoring and evaluating the local government's progress toward meeting the implementation schedule.

The West Billings Neighborhood Plan proposes strategies for implementation in Chapter 6 of this document, Implementation.

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APPENDIX A

Community Engagement

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Public Engagement: Phase 1

Project Website

The website for the West Billings Neighborhood Plan is an online platform designed to inform and engage residents, interested community members, and City and County officials about the ongoing planning process for West Billings. It provides a central hub for accessing project updates, documents, maps, and resources related to the development of the plan and provides a space for the community to engage in online interactive activities.

Two surveys were created initially to gather perspectives on plan priorities, themes, and goals. Survey questions focused on individual perceptions of success of the 2001 plan and whether the goals and themes set forth in that plan are still relevant for the community today. In addition, an interactive map was available for individuals to place pins and routes on a map to indicate various landmarks and gathering spaces that make West Billings special. Survey 1 was available from March 3 through June 30. Survey 2 and the online map was available from March 20th through June 30. Survey and map results can be found in detail in Appendix C.

Engagement Website Statistics

March 3 - July 1, 2024

2102 | Unique Sessions

218 | Completed Surveys

2m 34 sec | Avg. Session Duration

In-person Events

An open house, held on March 20, 2024, provided residents, interested community members, and City and County officials an opportunity to learn about and contribute to the plan development for West Billings. It offered a casual and interactive setting where attendees engaged with project materials, shared their perspectives, and interacted with the project team. 11 Informational boards were set up around the room and manned by project team members. The boards provided detailed information about what a neighborhood plan is, a contextual map of the area, the four major themes from the 2001 plan, land use and transportation, effects of transportation on land use and community character, transportation improvements map, and a next steps timeline for the project.

West Billings Website - Sanbell

Public Open House - Sanbell

Public Open House - Sanbell

Survey Number One

Two online surveys were available to the general public during the initial phase of the project. Survey number one, “West Billings Plan Issues Survey” was available from February 15 2024 until June 30, 2024. 186 surveys were recorded for Survey number one. Survey number two, “Themes and Goals Survey,” was available from March 20, 2024 until June 30, 2024. 32 surveys were recorded for survey number two. Both surveys were available on the “Be Heard Today” page of the project website and had both closed and open ended questions. The following paragraphs provide the detailed questions and responses from each of the surveys.

Plan Issues Survey

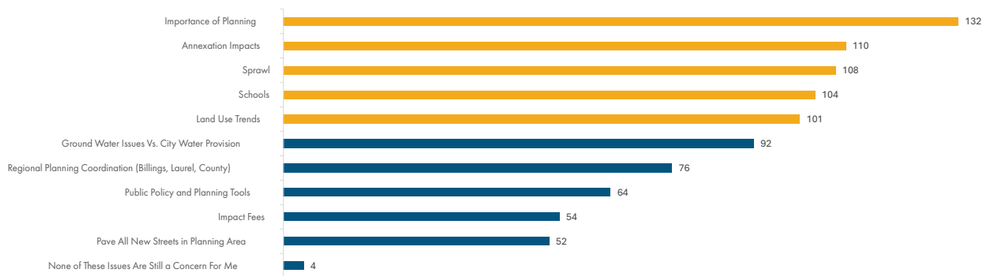
Question #1

During the creation of the 2001 West Billings Plan, 1,900 members of the public made the list of issues below and ranked them based on priority. We now want to see if those priorities are still relevant to you!

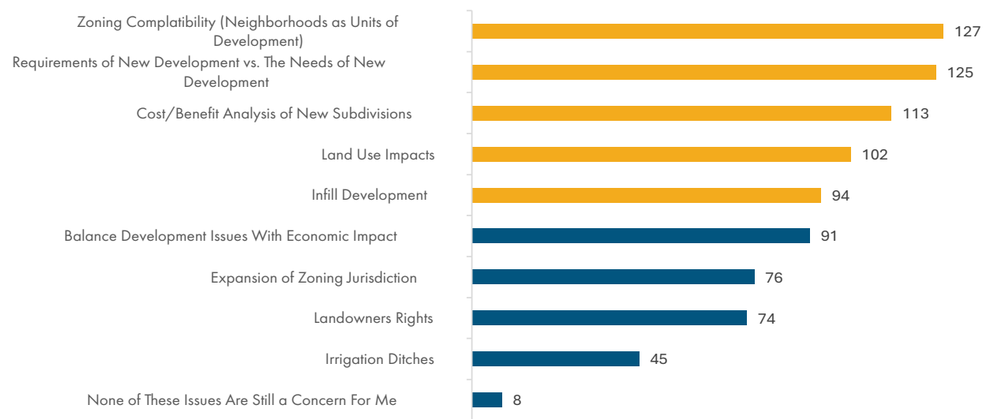
Below are 4 themes that were developed based on public feedback during the 2001 Plan. Each theme has a list of issues or areas of opportunity the community wanted the plan to address.

Select all items that are still important to you or need to be addressed in the 2024 Plan.

Theme 1: Planned Growth

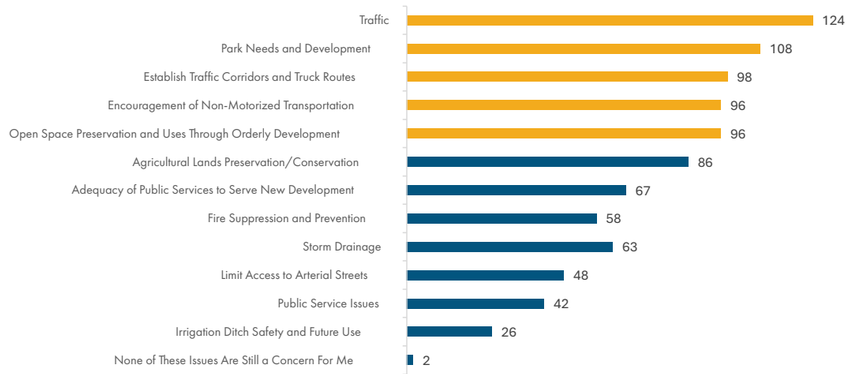


Theme 2: Appropriate Land Use



Theme 3: Distinctive Community Character

Theme 4: Public Safety, Open Space, Waterways and Scenic Resources



Question #2

Looking forward to the 2024 Plan, are there additional areas of concern you would like to add?

Survey respondents expressed concerns about traffic safety and infrastructure. Many emphasize the need for improved traffic control, including roundabouts, reduced speeds, and better crosswalks. There’s a strong call for more bike paths, pedestrian-friendly areas, and public parks. Water conservation and sustainable growth, with an emphasis on mixed-use development and higher density housing, are also highlighted. The community wants a balanced approach to development that considers public input, addresses traffic congestion, and prioritizes non-motorized transportation options.

Question Two Theme Summary

Frequency Count	*Theme*
44	Vehicle Transportation, Public Transportation
28	Business Growth, Planning Process, Density, Growth Impacts
27	Non-motorized Paths, Open Space, Amenities
11	Pedestrian Safety, Public Safety
6	Resources
6	Affordable Housing, Cost
4	Schools
2	Public Input

Theme	*Description*
Vehicle Transportation, Public Transportation	Concerns about infrastructure development, traffic congestion and road sufficiency. Desire for improved traffic management and alternative transportation options. Interest in reducing traffic on major roads and improving traffic flow. Interest in improving traffic patterns and improvement in public transportation.
Business Growth, Planning Process, Density, Growth Impacts	Preference for interconnected neighborhoods with fewer dead-end roads. Focus on family-friendly commercial and public spaces. Concerns about the impact of urbanization on rural lifestyle and environment. Suggestions for better planning and design, including County and City working together. Desire for mixed-use, eco-friendly developments, and complete neighborhoods with diverse amenities.
Non-motorized Paths, Open Space, Amenities	Desire for more multi-use paths and off-road cycling areas. Need for more non-motorized infrastructure, parks, and recreational facilities. Access to paths, trails, and facilities.
Pedestrian Safety, Public Safety	Concerns about pedestrian safety. Importance of public safety and crime management.
Resources	Concerns about resource availability, including water.
Affordable Housing, Cost	Developing affordable housing options Concerns about rising property taxes and cost of living.
Schools	Emphasis on schools and safe transportation for future growth.
Public Input	Importance of public input in park development and urban planning.
Tourism	Interest in tourism-related projects such as lakes, trails, and

Detailed comments:

- Theme 4 is very important. Trees need to be planted and maintained on street development. Trees need to be part of infrastructure not just amenities. Trees slow traffic and help prevent accidents.
- Rimrock road is very narrow and dangerous at such high speeds. Grand Avenue from 70th the 54th is too narrow and dangerous at such high speeds.
- I want to live in an area where I can walk and/or ride my bike to local grocery stores.
- More bike paths/trails!
- promote public safety through street design. no roads or strouds! prioritize non-vehicle transport. narrow streets and create places to visits. needs trees along streets for safety and beauty.
- As we move forward, please include development of shared use paths and non-motorized transportation as integral parts of the planning....not as a secondary afterthought. Thank you!
- Do not connect main streets(Grand, Central, Rimrock, etc) through residential neighborhoods.
- Speed limits are too high with additional apt. and subdivisions. Roads with no shoulders or turn lanes but more traffic. Noise and speed leads to road rage incidents and fatalities.
- Forced annexation of current rural land; creation of new traffic flow in relation to private land owner rights.
- Water conservation - landscaping less water intensive than KY bluegrass (reasonable lawn sizes, use of lower demand lawn species (e.g., buffalo grass). GW quality & quantity.
- Continued dependence on the groundwater resource as a primary driver of subdivision placement and growth is ill advised. The City/County must find a way to support aquifer recharge.
- Encouragement of mixed-use development within walk-able and bike-able neighborhoods - controlling sprawl so that municipal services are not spread over a wider area than the tax base can support
- City Parks and family recreation must be a top priority as opposed to trail development
- Emphasis on transportation and traffic. Rimrock Road east of Shiloh is a nightmare for residents, motorists, and other foot and cycle traffic. Consideration MUST be given to traffic flow.
- Please listen to and consider the legitimate concerns of the residents who chose to purchase and live out here away from many of the things we believe you intend to (directly or indirectly) bring
- COMMUNITY, town centers, movie theater, restaurants. ACCESS to hiking trails, especially along the rims
- COMMUNITY, town centers, movie theater, restaurants
- I would need more space then this. The County does not work in collaboration with the Cities, let's start with that. Ask anyone about an SID after they are annexed.
- Public parks and access to them via trails.
- Widening rimrock road to at least 3 lanes btwn 54th & 50th; dangerous in winter months during icy weather & shaded by tall trees. Also install side road to limit residential access vs driveways.
- To summarize my concerns, West Billings needs to be more dense and not be so sprawled. The focus needs to be on the communities being built and

making it easier to walk, bike and roll around.

- Before putting more traffic on a road, I would like to see the road improved prior to approving building. I understand its difficult to do without the funding, but make the developer pay up front!
- Something that is realistic so it makes it off the ground.
- I would like to see the final plan to balance the land use and development patterns with the need for more supply of all asset types.
- eliminating parking minimums, creating more bike/walk friendly infrastructure, create more medium to high density housing and mixed use zoning. WAY LESS OBSCENE SINGLE FAMILY HOUSING.
- bus routs extending bus hrs loincume housing bike pathes
- Students walk/bike safely to school; sidewalks & bike paths!; sprawl is costly, should be more dense, esp around Shiloh Crossing & other economic hubs; lack of city/county/school district coordination
- We should grow up, not out. Traffic control. Low cost housing must become a reality.
- emphasis on schools to take care of all the future growth - already crowded walk/bike paths for safe transportation to and from schools
- Developing affordable housing options
- I would love to see neighborhood connected my paved multi-use paths as well as more off-road cycling areas in parks.
- Billings lakes project, more trails, hand cart railroad at new park, monumental western statues, Major Museum on west end, dinosaurs, Museum of Rockies east interesting in assisting ? Tourism
- I lived on Molt road from 2006-2023. I watched Ironwood grow and all the neighborhoods off Rimrock Road be added without new roads. The roads NEED to be made sufficient for the new communities first.
- Release of the west end water study and impacts on growth.
- Small commercial/retail businesses should be allowed in neighborhoods as opposed to pushing all commercial activity to major intersections. Streets should be designed to encourage lower speeds
- Public Input is important when developing parks & new development in general. We are glad your firm is contracted to do this plan. Disappointed in the Cottonwood Park Development Process. Thank you.
- Require that all subdivision have interconnecting side streets, limit the cul-du-sacs and dead end roads as go nowhere neighborhoods are a waste of tax payers money.
- More trails for bikes, protected bike lanes.
- Our community desperately needs more non-motorized infrastructure for cyclists and pedestrians. We also need a west end skatepark! Several cities the size of Billings have 2 or 3.
- The more we focus on the development of family-friendly commercial and public land, the better for everyone. The majority of new development has been for adults. We need activities that include kids
- -Areas where City/County envision Heavy Commercial/Light Industrial zoning -Halt on development north of Canyon Creek/Hogans Slough with depletions from groundwater wells reaching a tipping point.
- Concerns with land use density and future infrastructure maintenance costs - ie land use should be dense enough to provide enough tax dollars to maintain the infrastructure serving it in perpetuity
- Schools, traffic, bike and walking paths, balance of types of housing and commercial, avoid concentration of high density housing zones as is being created between Shiloh and 48th near king
- Traffic and pedestrian safety on Rimrock Road. Cannot cross as a walker
- Multi-use paths need to be considered. Much of the West end area is bike-able but limited safe paths exist to get off very busy streets with no shoulder such as 56th, 48th, Central, Grand, and King.
- bike/walking path needs to be extended West, with connection to Grand/Central west Grand needs widening. It is congested and very dangerous for cyclists
- Allow for safer bike transportation with separate bike paths.
- Traffic control and multi use trail access. Excessive speed and aggressive driving are degrading the quality of life for residence along Rimrock road. Wonderful neigborhoods are at risk of decline.
- The impact this will have on 58th st west between Rimrock Road and Grand Ave. and on Pops Meadow subdivision, which is not in the city limits
- I am concerned about the over population projected into areas where current residents have chosen a rural lifestyle.
- Required cops to manage crime Parks and schools Trails and streets Carve out small commercial areas for good, etc
- Traffic on Rimrock Road
- Before any more construction and new subdivision's, we need to look at the infrastructure. Rimrock road cannot handle 900 additional cars. A roundabout isn't the answer.
- Great improvement to Rimrock Road!
- Impact of increased traffic on Rimrock rd. Limit of weight allowed on Rimrock rd. What is happening to the roadway and infrastructure beneath. Cracks in asphalt is occurring.
- We need the Molt Road Connector. We have been talking about this for years. Traffic, trucks in particular, need an alternative to Zimmerman Trail.
- Traffic! Making sure that the plans adequately handle the increased amount of traffic on Billings roads. It is

nearly impossible to get anywhere in a timely manner during high traffic hours.

- Traffic is my main concern. Followed by public safety and available resources.
- *Traffic, speeding, semi-truck use of roads *Better planning for commercial buildings so there aren't so many "box" looking businesses; require stone exteriors (for example), landscaping, etc.
- Develop plans to reduce traffic on Rimrock Road and improve safety on that roadway. Consider traffic diversion and calming as well as alternate routes. Molt Connector should be considered
- critical that pedestrian & cyclist safety are considered as traffic increases further west. The plan needs to account for increased traffic loads coming from the west impacting incumbent neighborhoods
- Iam 24 and I plan on staying here in Bllings. I would love to see a beautiful Westend but the traffic should flow very nicely with clean water through out all the new development
- Extensive use of sidewalks-walk/bike/skate/run safely on roads. Improved bus service (longer span of hours available, more frequent times per bus stop). Public safety (more visibility of officers).
- Number 1 issue considered should be cost. Property taxes are ever increasing. We are already pushing those on fixed incomes out of their homes.
- Grand west of Shiloh- traffic patterns. Bike lanes
- Construct 4 lane Rd Grand Ave - Shiloh Rd to 56th.
- Every item listed is important.!
- Mixed-use developments that are eco-friendly
- Schools and infrastructure
- Accessing the west side from the heights
- ISO rating maintenance
- Police, Fire are top concerns. Current plans suck!
- Put commercial only on corners (commercial nodes).
- An arterial connector to the new belt loop road.
- Failing county H2O systems and annexiation
- Encourage large lots in city vs county.
- Slower traffic needed in SUBDIVISIONS and main roa
- No "affordable" housing on the West End!
- Complete neighborhoods (retail and residential)

Note: Some public comments were specific to areas outside of the plan area. Those comments have been removed from this summary report. However, all comments have been provided to the City of Billings and Yellowstone County for documentation.

Survey Number Two

Themes and Goals Survey

Question #1

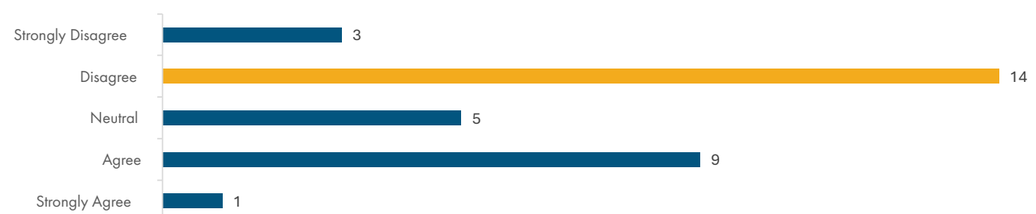
When thinking about growth in West Billings since 2001, do you believe that the growth has matched the intent of the 2001 Plan? Why or why not?

The comments suggest the execution of the 2001 plan has leaned heavily towards sprawl with an emphasis on cars and large houses. There's suggestion of a lack of mixed-use development, leading to separate areas for living, working, and recreation, causing increased traffic and infrastructure strain. While some respondents believe areas like Shiloh Road have seen positive growth with new restaurants and green spaces, overall, there's belief that development has extended westward beyond expectations without adequate infrastructure or public transportation. Some respondents suggest the lack of consistent infill development and coherent public planning has led to fragmented neighborhoods and insufficient public amenities, such as parks and trails. There's also an issue with the annexation of property without sufficient funds to maintain infrastructure, highlighting the need for impact fees. Despite some improvements, such as bike lanes and trails, the rapid population growth and demand have outpaced the original projections and plans, creating challenges in balancing growth and maintaining community integrity.

Detailed Comments:

- Don't know vision of 2001 plan
- There has been too much emphasis on cars and large houses.
- I'm ignorant of the specifics of the plan.
- development is compact but on islands of houses/subdivisions which spreading utilities like sprawl. people only live on the west end and don't have offices as much to prevent driving to downtown. make west end a destination to not only live but work! still need work on public transportation throughout this sector. mixed land use could improve as where people live are different than their work or eat or visit.
- I think things have filled in pretty well up to Shiloh Road and a good deal of development has been done right off of that as a main street. I would encourage additional development of two things in those neighborhoods in particular: restaurants and green spaces.
- Too much property annexed in without enough funds to properly care for the infrastructure. Impact fees are a must!
- The key strategies seem to have been

Do you believe that the growth has matched the intent of the 2001 Plan?



considered, but our west end expansion has blurred the intent of the strategies.

- Zoning changes occur that are contradictory to the projected zoning of 2001.
- West Billings has become a mess of sprawl and high-speed traffic with way too little infrastructure to support walkable and bikeable neighborhoods.
- The development of new apartments and the sprawl of the apartment footprint doesn't seem to reflect the infill development and coordinated growth.
- The plan anticipated growth fairly well; however, the rapid population increase in the last 4 years has sped up the timetable so many of the 2035 goals need to be implemented much sooner.
- As I recall, the plan was to not develop irrigated farm land and that has happened.
- It does not feel like we have seen a lot of infill since 2001; rather it seems like more and more subdivisions are being built out further west (64th Street and beyond). This feels like the Developers are more apt to build out in the county (which I assume to be cheaper) and then dump the traffic and infrastructure problems on the city eventually. This isn't super great. Also rarely do we see any attempt to rehabilitate downtown or other areas that are becoming eye sores. I suspect, but could not prove, that a lot of this comes from the fact that downtown landowners are wanting too much for their properties compared to simply building out further west. What amazes me, is that downtown would be the perfect place for high density development (for example the empty lot on the corner of 6th and 27th across from the Library) yet we have not seen attempts to build large apartment complexes down there, you have to ask yourself "why?".
- Growth has exceeded the 2001 projections.
- The interface between large lot county subdivisions and city development is an issue. Through a combination of market forces, local policy bodies, and strong demand, the end result has been challenging to work with.
- Very little of the west end development over the last 20 years could be described as "compact". All development has increased reliance on automobiles. Lack of County support has continued deterioration of west end aquifer.
- growth continues to sprawl far west (not dense infill of existing), creating traffic issues for cars, cyclists and pedestrian access Park development has not occurred, especially in West end. Land tends to be set aside, but no park developed or park space split up into small useless boulevards that do not allow for public use. Multi-use trails are often not connected or connected haphazardly (changing sides of the street, require crossings at high traffic intersections, etc.) I have not seen any evidence of water supply conservation such as city promoted conservation efforts such as high efficiency appliances, xeriscaping/water wise landscaping initiatives, etc.
- No apparent planning for balanced development as evidenced by lack of neighborhood parks and schools, current concentrated zones of high density housing known to be bad for communities, lack of traffic planning creating unsafe traffic patterns
- Growth in Westend has attempted to mirror 2001 plan as I understand. Success or failure has always been in the eye of the individual citizen.
- Developers have had to respond to official and resident concerns based on the 2001 plan.
- Seems very thought out and purposeful. Access and roads are well done.
- we have more bike lanes and trails than in 2001.
- There has been an OVER abundance of density of development within the west end. There is no dedicated open space for parks or other forms of outdoor entertainment available to the community. There is no mixed use of development, I can only think of 2 areas that have been designated for

Question 1 Theme	*Description*
Lack of Compact and Consistent Development	Development has increased reliance on automobiles. Growth has sprawled far west, creating traffic issues for cars, cyclists, and pedestrians. This has led to a patchwork of city and county parcels with inconsistent zoning and development practices.
Park and Open Space Development	Park development, especially in the west end, has been limited. Multi-use trails are often not connected or connected haphazardly.
Infrastructure and Planning	Lack of balanced development planning, evidenced by a lack of neighborhood parks and schools. Concerns about high-density housing and unsafe traffic patterns. The lack of coordinated effort and strong policy implementation has hindered the effectiveness of the plan. Properties have been annexed without sufficient funds to support necessary infrastructure.
Mixed Opinions on Development	Some perceive the development as thought-out and purposeful, with well-done access and roads. Others criticize the overabundance of density and lack of mixed-use development.
Implementation of Plans	Views on the success or failure of development plans vary among individuals. Some believe developers have responded to concerns based on the 2001 plan, while others doubt the existence of a comprehensive plan.

businesses and the rest is residential since 2001 that has grown, this including the Shiloh center and the more recent development of business on Grand and 54th. Then for coordinating public infrastructure, the best agriculture land is being over taken for it's convenience.

- There does not seem to be good mixed use development other than a couple small instances.
- I am thrilled with new development in Billings. The further development along Shiloh Road and near the zoo is wonderful. At the same time, the integrity of neighborhoods is being protected and preserved. The development of new trails has been wonderful! It is one of the things that we love about Billings. We don't have the best trail system in Montana, but it is improving all the time.
- I disagree because I don't believe there is much of a plan for the subdivisions, traffic and trails. Most everything is developed by the individual landowner and traffic patterns and surrounding development tends to simply adjust.
- We have lived on the far west end of Billings for just over 10 years and when I saw that there was a 2001 plan, my first thought was "well, you could have fooled me." Just a cursory look at the hopscotch nature of city/county parcels surrounding Grand Ave west of Shiloh says that if there was a plan at one time, no one had the fortitude for implementation. Cities with plans that are implemented are easy to spot... Fargo/West Fargo/Mapleton, ND, and Fort Collins/Loveland/Windsor, CO are two prime examples of how to expand into land that was once agricultural use by annexation or incorporation.

Question #2

What are the most important issues related to Planned Growth that the 2024 Plan should address?

The comments suggest opportunities for widening roads with walking and biking paths, preserving open spaces, and conserving water supplies. Respondents would like to create walkable neighborhoods with accessible amenities, reducing reliance on cars. They suggest focusing on infill housing, mixed-use development, and compact growth to control sprawl. There is a request for effective public services, affordable housing for all income levels, and integrated public transportation. Managing increased traffic, ensuring consistent development, and enhancing green spaces and trails are essential. Cooperation between the city and county, respecting landowner rights, and promoting diverse socioeconomic neighborhoods are also critical. The overall vision is to create safe, community-centered areas with efficient infrastructure and minimized sprawl, with some suggesting to use the development model of Bozeman and avoiding issues like casinos and large box stores.

Detailed Comments:

- Widened roads with appropriate walking/biking paths along the major corridors. In addition, NO CASINOS! West end should look like Bozeman
- Water supply conservation, open space preservation, and effective public services
- Neighborhoods where people can walk and access what they need without having to use cars all the time.
- Trails, infill housing
- creating complete and safe streets that would provide wealth, growth, and places for people to visit. No having roads or stroads as people are flocking still to the downtown from the west end.
- 1. Traffic is a big one. As the west end continues to expand, the city needs to keep up or stay ahead of the growing traffic. A couple other cities in the state were not prepared for the growth they've experienced over the past decade, and it shows when you're driving through parts of those towns. Thus far, Billings has been able to keep up on this end of town, but continuing to plan ahead there will be important. 2. Green spaces.

Question 2 Theme	*Description*
Mixed-Use Development	Advocacy for neighborhoods with a mix of residential and commercial/retail activity to promote economic diversity and support local businesses. Desire to avoid concentrating commercial development at major intersections, favoring smaller businesses that contribute to local wealth.
Safety and Connectivity	Emphasis on pedestrian access, trail connectivity, and mixed-use developments to promote walkability and community interaction. Focus on efficient traffic flow, connectivity of multi-use trails, and promotion of public transit to reduce reliance on cars. Calls for streets designed with safety in mind, prioritizing reduced speeding over traffic throughput.
Balanced and Cooperative Planning	Preservation of parks, green spaces, and open areas within neighborhoods to create safe, balanced communities with access to amenities and neighborhood schools. Advocacy for city/county cooperation in land use planning, along with incentives for annexation to promote coordinated development. Recognition of universal goals such as safe neighborhoods, thoughtful expansion, water conservation, and quality of life.
Affordable Housing and Sustainability	Need for more affordable housing and protection of existing neighborhoods from large multiunit apartment developments. Concerns about overgrowth and water conservation, along with the importance of multi-use trails for walking and biking.

Most of Billings has a park within five minutes of any residence, which is terrific. Keeping that trend would be wise. Also, obviously, we have world-class hiking in the state, but you can't always hop in the car and drive an hour or two. A planned walking/biking trail or a forest-centric park on the west end would be great.

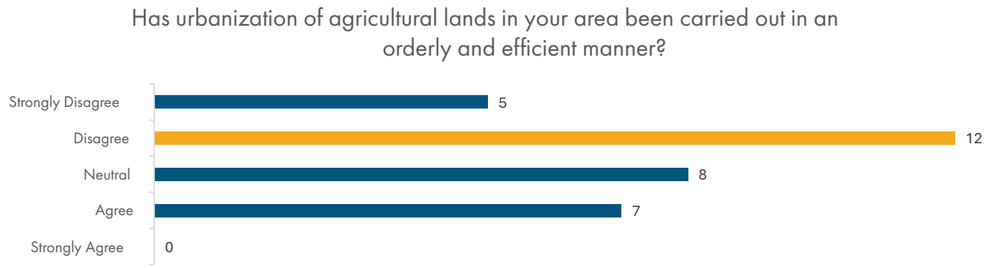
- Water shortages. Infill. Native landscaping. Mixed use spaces. Affordable housing for ALL income levels, not just working class. Public transportation. Parks.
- The management of increased traffic needs to be added.
- Rezoning of land with disregard to current land owner rights.
- Controlling sprawl - encouraging compact, mixed-use development / growth - encouraging walkable and bikeable neighborhoods - discouraging single-occupancy vehicle trips in every way possible
- The architecture and footprint of multi family housing. We need to include low income options on the west end to encourage diverse socioeconomic neighborhoods.
- Expanding Grand Ave btwn Shiloh & 54th as well as rimrock road btwn 50th & 54th. Both of these 2-lane roads are currently dangerous & congest traffic terribly. The recent light at 48th & grand was helpful, thank you!
- Traffic flow, school populations and consistency in development.
- The traffic, and more specifically multi-modal access (paved bike paths) should be required for any new sub-division build or expansion. If you're going to build out that far, you need to only only prove that the road will handle the additional traffic, but that you have given options to those that live out there to avoid driving. In my opinion if you force that issue, you will naturally see in-fill become more attractive because the infrastructure was already built, in addition you would also see more incentive to rebuild in areas that have become blighted.
- Traffic and checkerboarded city/ county development. Billings will not be able to achieve the density needed for obtainable workforce housing if YC development continues requiring 1/2-to-1-acre parcels of land to accommodate water wells and septic systems.
- A greater spirit of cooperation among Yellowstone County and the City of Billings elected officials.
- Development of actual neighborhoods that contain a mix of residential and commercial/retail activity. Stop pushing commercial development to major intersections...this encourages larger box store and franchise type development instead of smaller business that keeps wealth in Billings. Streets should be designed to favor increased safety and reduced speeding over traffic throughput.
- Pedestrian access and trail connectivity Promotion of mixed use developments and walkability
- See above- preservation of parks and green space, planning focused on creating safe balanced communities with neighborhood schools and safe ways for children to walk or bike to those schools, mixed housing, traffic planning
- I don't believe the stated goals of the 2001 Plan have changed that much from the needs, expectations, desires of the Westend population although the "Westend" definition has migrated. Safe neighborhoods, thoughtful planned expansion with an eye on water use, open space (park) integration, traffic flow, new school necessity, and quality of life are still universal goals. How new developments effect property values/ rights need mandatory safeguards.
- transportation including walkability affordable housing consistency within neighborhoods
- Making certain all development is needed, is accessible, has plenty of green space, is in keeping with school and commercial needs.
- Access to trails
- There should be a stop on the growth and a developed plan for improving the mistakes already made. There should be an improvement in the transportation in and out of this area to assist in its over growth and creating more open space.
- Continued development of open space, trails, and parks.
- We need more affordable housing. We need to continue to protect our neighborhoods. Large multiunit apartments should not be allowed in residential areas where it is primarily single family homes. The number of new development outside of the City is of concern. Also of concern are the number of new water wells on the west side of town and the dropping water levels. We really need more multi-use trails for walking and biking. This should be a majority priority for the City.
- Efficient and effective traffic flow, Connectivity of multi-use trails and sidewalks, Areas for public transit and encouragement of the use of public transit. More safe and sensible community spaces, parks, amenities, trails, & sidewalks, Water preservation and water drainage. Let's make West Billings a walkable, community-centered area, instead of accessible only by car.
- City/County cooperation in land use planning. City/County incentives for annexation...the carrots City/County enforced consequences for not submitting to annexation...the sticks.

Question #3

In your opinion, has urbanization of agricultural lands in your area been carried out in an orderly and efficient manner?

Please share your opinion.

The comments highlight concerns about the patchwork development and sprawl in the west end of Billings, leading to increased service costs and traffic congestion. Lack of county oversight and planning makes it challenging for the city to implement infill development effectively. The development pattern is criticized for its lack of focus on creating balanced communities, with examples cited of high-density housing without adequate infrastructure and parks. The conversion of agricultural lands into housing and business areas is seen as unplanned and driven by economic forces rather than thoughtful urbanization. There are also worries about the loss of farmland and the impact on future food production. Additionally, concerns are raised about the threat of future gravel pits and the lack of a coherent plan for preserving agriculture. Overall, there is a sentiment that current urbanization lacks foresight and orderly planning, threatening agricultural viability and community cohesion in West Billings.



Detailed Comments:

- Taking FOREVER to complete the roundabout at 62nd & Rinrock, AND there is no evidence Of walking or biking paths that will be connected
- It is sad to see the loss of agricultural land, and seeing it gobbled up for sprawling pavements, parking lots, and over-sized houses.
- I like how the agricultural lands are being developed but I do not like that taxpayers bear the burden of expansion costs rather than developers who are making a pretty penny of the expansion.
- The next generation of using the agricultural land for crops is not interested in farming the land. Selling it for urban development is their solution.
- Billings has a history of disregarding individual land owner concerns over the financial incentives from developers. City officials and developers do not take into consideration the future water needs of high density population areas.
- Over the past 20 years, housing development in West Billings has proceeded in an uncontrolled and opportunistic manner, driven largely by bottom-line economic concerns of developers, NOT by relevant urban panning considerations. The result has been an intermixing of agricultural and residential land uses that is ugly, inefficient, and chaotic. What a mess!
- The casino & liquor store on grand & 54th is not a welcome sight. Brings tougher crowd & more DUI's to nearby family neighborhoods.
- I still see active cultivation on the west end; and I have never encountered conflict with the development so I cannot speak to this point.
- Again, the checkerboard pattern of City/County doesn't allow for efficient extension of public water or wastewater systems.
- The urbanization of ag lands has been slightly haphazard.
- Patchwork development has resulted in sprawl and increased service costs for city residents. Lack of County interest in orderly/planned development makes city infill development harder.
- West end continues to see far west development, "leapfrogging" over several vacant areas on west end leading to sprawl w/ lots of traffic
- There does not seem to be any real oversight in development that is grounded in creating healthy balanced communities as evidenced by large area of concentrated high density housing being built between Shiloh and 48th south of central, no work on main east/ west road routes to create safe roads with biking/pedestrian paths and reduce congestion, lack of parks on west end
- The development of agricultural lands to housing/business utilization seems to follow a leap frog progression, likely due to economic forces rather than a planned, progressive, infill architecture.
- Far west end is absolutely random. However much is not in city limits. A shame there hasn't been zoning.
- Urbanization appears to be orderly. We will regret the lack of farmland in the future, due to needs for fresh produce.
- What a shame that our ancestors cleared the land for agricultural, putting hard labor into the land to be sold for a low ball dime to build subdivisions. With all the agricultural land being taken away where and how are people going to get their needed food when there is no good fertile agricultural land available any more because all the ugly subdivisions have been put on the best easy convenient agriculture land.
- I disagree because of the actions of Yellowstone County. Several areas are threatened by future gravel pits, which makes the development of those areas difficult. Who wants their home next to a gravel pit.
- There is no plan with respect to preservation of agriculture in West Billings; most developers are cashing in on the opportunity to develop these lands and so agricultural lands are

scattered and inefficient.

- Again, one look at the hopscotch board of city/county parcels west of Shiloh tells the whole story.

Question #4

From your perspective, what improvements or changes would you suggest to enhance the orderly and efficient urbanization of agricultural lands?

The comments emphasize the need for adherence to city standards and annexation requirements for new developments within existing city limits. Concerns about unchecked sprawl westward and traffic safety issues highlight the importance of establishing natural buffers and implementing efficient traffic management. Suggestions include developing family-friendly parks, regulating development density, and fostering community involvement in planning. Preservation of agricultural land is a key concern, alongside dissatisfaction with current County Commissioners and calls for stronger regulations and leadership to address development challenges effectively.

Detailed Comments:

- Widened roads & bike paths for safety and to enhance fitness
- Teach people how to honor the earth.
- City sized lot developments, no septic systems.
- provide more incentive for building closer to the city limits or providing more infill. leave agriculture lands as community gardens, parks, or nature walks for places for people to visit.
- Impact fees for w/s/g, fire and police services. Parks MUST belong to City of Billings with appropriate maintenance agreements that include how all costs will be covered by neighboring properties rather than taxpayers as a whole with an ever-growing PD1 (which is now defunct and should NOT be!)
- Limit huge apartment complexes.
- Allowing current land owners to maintain their current status of land use.
- Do not allow anymore casinos/bars on this end of town nor apartment complexes. Should be family neighborhoods & parks.
- Develop dryland before irrigated land.
- If the desire is to preserve existing farm land, you need to make infill or overbuild/upzoning more attractive (cheaper) or make purchasing the farm land/developing it more expensive. There does not seem to be strong political will to do so, which is a shame!
- Farming is not profitable for most smaller operators. The farm kids don't want to come back in most cases and run the farms. The City of Billings needs to annex YC properties that are no longer viable.
- A greater confidence that any land use entitlements that meet the defining criteria can be secured.
- All development within 1 (2?) miles of existing city services must be developed to city standards with annexation required.
- far west end buffer of natural space that prevents development from continuing to sprawl westward and encourages development of several West end vacant areas prioritize efficient traffic patterns for existing city limits and do not provide high speed corridors to far west end/outside city limits. Currently, the commute is fast because you can drive fast in east-west direction, which not only incentives development further west but the high speed traffic makes it difficult and unsafe for walking and biking.
- Address arterial roads, requirements for developers to designate and develop family/kid friendly community parks and paths within developments, restrictions on how much commercial, industrial, high density vs low density housing can be developed with each square miles in coordination with adjacent square mile plots/zones
- Community involvement in the planning process. Coordination between County/City planning. Cost/benefit analysis of any future development in regard to resource utilization before annexation.
- It's difficult as some owners of closest in land don't want to sell. The best development is fill in from edge.
- Save the farms.
- DON'T URBANIZE THE AGRICULTURAL LAND, find something else where!
- We need new County Commissioners. Those guys just aren't going to do anything to make things better. The County Commissioners are advancing an extreme Republican partisan agenda.
- No subdivision or business development without annexation. Period. Set a standard and follow it. For example, no more than one home per acre on county land.

Question #5

When thinking about West Billings, what contributes most to the character of the community?

The comments reflect diverse perspectives on the character and development of West Billings. Some highlight a desire for the area to match the community feel and amenities of places like Bozeman, emphasizing parks, recreation areas, and mixed-use spaces over large houses and retail chains. Others lament the loss of farmland and express a need for more distinctive landmarks and public gathering spaces to foster community spirit. Concerns are raised about the current character of West Billings, noting its suburban sprawl and lack of cohesive identity beyond retail developments and busy roads. There's a call for more parks, trails, and family-friendly amenities to enhance the livability and appeal of the area beyond its current utilitarian infrastructure.

Detailed Comments:

- New housing, should match Bozeman's efforts
- built environment and parks and

recreation areas

- Cars and large houses.
- The disappearing farmland.
- destination places where people gather create the sense of community
- Honestly, because West Billings has effectively developed over… 50? years… character is a little hard to define. There's kind of a hodgepodge of architectural styles. For prominent places, ZooMontana stands out as a landmark, gathering space, and event spot. I'd say the next three most notable locations on the west end would be Faith Chapel, Costco, and the wetlands preserve.
- Parks Schools Mixed use retail Big box shopping Chain restaurants Casinos and car washes Lack of public transportation options
- West Billings is an extremely large area that has only one small public gathering space: Phipps Park. Although Phipps is fantastic, this large section of Billings needs more public gathering spaces. Development of Cottonwood park or other natural areas would add to the character of the community. The streetscape on Shiloh is also a bonus for this area. It's very attractive.
- Places for community to gather combined with the built environment
- The character, friendliness, and individuality of the Westend citizenry.
- mixed use
- West Billings has little character. Flat, no grand parks or beautiful landmarks. I consider Grand to Rims NW Billings.
- Retail markets
- I don't know
- Clean and well kept neighborhoods, businesses and parks.
- Rural, disperse, historic characteristics of the western lifestyle
- West Billings doesn't have much character. Recently I was in Issaquah WA. The neighborhoods in that city were walkable, friendly and safe. The west end is full of closed off neighborhoods and busy 4 lane roads. The walkability to parks, restaurants and other neighborhood amenities is lacking.
- Safe family neighborhoods, not worrying about DUI's around corner of the area due to casino & liquor stores in middle of family neighborhoods & schools.
- Quiet living.
- I am not sure that this needs character? West Billings, and in fact most modern development in the USA reflects suburbia, one would ask why that's bad? Do we really need a mom and pop shop ripping off the locals? Do we really need another casino, bar, or vape shop in a "neighborhood commercial node"? We had Mayor Bill Cole proudly highlight The Den there at 54th and Grand, did he take a moment to ask himself if everyone really appreciated another bar next to a church and school?
- I don't like the Den and Brew pubs that were approved by prior city councils. The west end is best suited for residential development. Very limited commercial developments are ok.
- Bedrooms and traffic.
- The west Billings area has very little character. It is the same type of generic suburban sprawl we could see almost anywhere.
- Places for community to gather combined with the built environment
- The character, friendliness, and individuality of the Westend citizenry.
- mixed use
- West Billings has little character. Flat, no grand parks or beautiful landmarks. I consider Grand to Rims NW Billings.
- Retail markets
- I don't know
- Great parks. Great trails. (We need more trails). Great shopping like Shiloh Crossing. The Shiloh Conservation Area. The future Shiloh Lakes. Great schools.
- Currently, the west end is a drive community, separated by individual subdivisions.
- Unless you count retail development, there's not much else. The character of Billings screams casinos and big box retail.

Question #6

What areas of community character would you like to see the 2024 Plan address?

The comments emphasize a strong desire for thoughtful development in West Billings, focusing on creating pedestrian-friendly environments with ample walking and biking paths, and aesthetically pleasing architecture similar to Bozeman's standards. There's a call for more parks, cultural events, and community spaces to enhance economic vitality and quality of life. Concerns about over-commercialization with casinos, large signage, and corporate influence are raised, advocating instead for smaller-scale, locally-owned businesses. Retaining the rural character with farming and ranching elements is important, alongside development that integrates natural areas and avoids excessive concrete developments. Overall, there is a consensus for balanced, sustainable growth that prioritizes community needs and environmental stewardship across West Billings.

Detailed Comments:

- Any new development needs walking/biking paths near their development & brick walls around development to avoid junky fences. No casinos, no junky signage, architecture requirements such as Bozeman uses
- parks and recreation areas, culture, economic vitality
- Park land.
- more public events on west end, farmer's markets, community non motorized where you see people out inside of in cars, and well managed parks.
- It feels like recent developments on/around Shiloh have a little more cohesion of style. Encouraging that would be a step. As mentioned above, stressing some green spaces would be a positive. Having good restaurants that sit in or

very close to neighborhoods is also nice... Siam Thai or the restaurants at Shiloh Commons would be good examples on the west end... The Granary or Black Dog (formerly Harper & Madison) would be an example elsewhere.

- Public transportation. More mom and pop restaurants and stores, less out of state corporate influence (unless it's high-demand stores like Trader Joe's we don't already have like Trader Joe's). No more casinos, car washes, or banks!
- Safe biking trails
- Retainment of the rural, farming, ranching characters. With livestock and crops.
- West Billings needs smaller-scale, user-friendly commercial and retail areas -- not more strip malls, storage facilities, and out-of-scale commercial and light industrial buildings.
- I believe we need to focus more on the neighborhood concept of our city. Billings needs more options for shopping, and fewer gas stations, casinos.
- Developing & supporting city park land that was donated and is located off Colton & 54th.
- Continue with quiet, laid back living.
- I think the great focus of this should be walk-able communities in the sense that there are trails to enjoy nature or simply walk the dog. We don't need to have it connect to a commercial node per say. For example, the Big Ditch Trail heads through several neighborhoods without a real connection to anything commercial, rather it connects to schools and parks which are great. People move out to these areas to escape the city and the blight that comes with it.
- We do need more parks on the west end. Cottonwood Park doesn't need a $9M community center. Do some open play space development where the kids can play. Open grass play fields, swales and hills with backstops for baseball play and practice.
- A greater mix of land uses that can meet the demands of the area, not just a neighborhood.
- Development of true neighborhoods, where commercial/retail is integrated instead of pushed away from residential areas. Minimum lot coverage with shared parking on large commercial developments to prevent over-paving and under-utilization of valuable land (e.g., Shiloh & King).
- More parks and natural areas Improved pedestrian access to business developments
- See above
- Affordable housing. Clean, safe, available public transportation.
- consistency within neighborhoods
- Grand to the freeway and Shiloh west.
- Trails linking the shops to neighborhoods.
- parks
- A focus on avoiding large concrete box store developments without intermingled mixed use and natural parks, vegetation, or open space.
- I would like to see more multi-use trails. We ride on and walk on our trails all the time. The trails are one thing that really make Billings a more attractive community. They help us retain and recruit new employees.
- Walkability/multi-use trails, community spaces, planning for schools, zoning and planning for commercial v. residential locations, and the development of appropriate roadways.
- A large park, like Pioneer Park, west of Shiloh. Trees lining Hwy 3 along the new trails on the rims. The walk is spoiled by the highway traffic. Better beautification projects on major arterials. Planting that are well maintained year-round, with large trees that absorb traffic noise along sidewalks and walking paths. This is specific to Shiloh road, but could apply all over town.

Question #7

What are three proactive measures that can enhance public safety within the plan area?

The comments highlight a strong emphasis on improving infrastructure for walking and biking paths, ensuring adequate drainage to prevent flooding, and managing traffic flow with measures like lower speed limits, roundabouts, and improved road widening. Residents suggest prioritizing the maintenance of parks and public spaces, advocating for well-maintained facilities and increased connectivity through trails and sidewalks. Other suggestions include managing urban density appropriately, addressing homelessness through supportive housing initiatives, and enhancing safety through improved lighting and traffic management. There's also a call for responsible development practices that include water conservation measures and thoughtful integration of stormwater management with park and open space planning.

Detailed Comments:

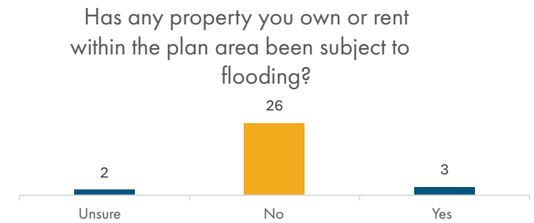
- Walking/biking paths
- constructing drainage corridors and ensure adequate fire flow
- Lower speed limits
- number of local own restaurants and grocery stores
- Ensuring that storm drains are able to manage water flow. While it hasn't flooded homes in our development, a street nearby routinely floods during heavy storms. I helped push two stalled cars out of the water last time
- Development of Permanent Supportive Housing for those who struggle with homelessness
- Park spaces that are well maintained.
- Decrease density
- dedicated bike / walking paths along all thoroughfares
- Put police in office located off grand and 54th.
- No over development
- Encourage Neighborhood Parks that act as meeting places (see "classic"

copper ridge) to know your neighbor
- Widen Grand Ave to 64th or 72nd. Four lanes with a turn lane, quit piecemealing development.
- Higher densities
- Average actual street speed
- Connect trails/bikeways/sidewalks to all neighborhoods <3 miles from Ben Steele Middle school to allow for walking or biking to school
- Traffic planning on main east/west routes
- Ability to enforce traffic laws through electronic/camera monitoring
- safe biking and walking
- A large park
- Require builders to mitigate potential building issues, e.g. those that occurred in Copper Ridge
- Police
- Adequate spacing and setback, including natural landscaping and vegetation
- We could use more areas to hold stormwater runoff. Not every area has storm sewers.
- Widening arterial roads, while narrowing residential road, to encourage safe and effective traffic patterns
- Be hyper-vigilant about graffiti removal. This tells the miscreants what will or will not be accepted in a neighborhood.
- Traffic lights/roundabouts
- joint-use facilities to ensure safe parks, schools, and trails
- Curb-outs at intersections.
- number of bike lanes and sidewalks
- Establishment of a low-barrier shelter option for those who struggle with homelessness
- Water conservation measures should be considered.
- Conservation of open space
- More lighting in neighborhoods or at least down 54th street & around casino.
- Observant neighbors
- Avoid building parks that are unfunded and therefore do not have maintanance, if a space is maintained its unlikely to have vandals move in
- Traffic calming with roundabout at 48th and Central. Also 48th and King.
- Enforcement of current traffic policies
- Number of drive-thru lanes (fewer means more people out of cars and engaged in the space instead of just driving through it)
- Pedestrian tunnels or bridges to cross major roads (King, Central, etc.) on Shiloh path. Current crossing lights are not sufficient
- Parks with playgrounds/ water parks for community use
- Safe, we'll lit, walking/biking paths to
- recreational space for all ages and capabilities
- Your Open Space plan is right on
- Build a trail from Shiloh to 56th St. West
- Dedicated trails and pedestrian access protected from roadways

- Build and develop more parks that can hold stormwater runoff.
- Improving water drainage and developing a plan for water sources for household use and fire suppression
- Street lighting in ALL new subdivisions. Not yard light…streetlights.
- Lighting
- More bike trails.
- number of two-way and only two lane streets
- Planned park developments that are adequately funded
- Don't allow main arterial streets to connect through neighborhoods.
- Limit through streets, encourage through current high volume areas with enhance flow in these current roads
- Lighting
- Add a bike lane.
- Percentage of homes within city limits
- Multi-use path along Grand Ave (west of Shiloh) and Rimrock Rd (west of 54th)
- Restriction of commercial development for sales of alcohol, gambling, pot distribution shops
- Cut traffic congestion with improved public transportation if feasible.
- youth programming
- Finish Cottonwood Park
- Use of water drainage systems in conjunction with open space or parks to consolidate and check multiple boxes
- Adequate lighting, traffic prompts, walking/trail underpasses under arterials.
- Proactive transportation plans… widening roads BEFORE projects are started. Turn lanes, adequate (full vehicle width) shoulders

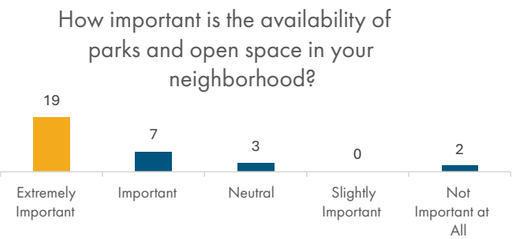
Question #8

Has any property you own or rent within the plan area been subject to flooding?



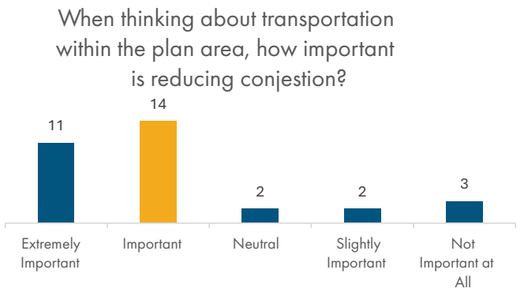
Question #9

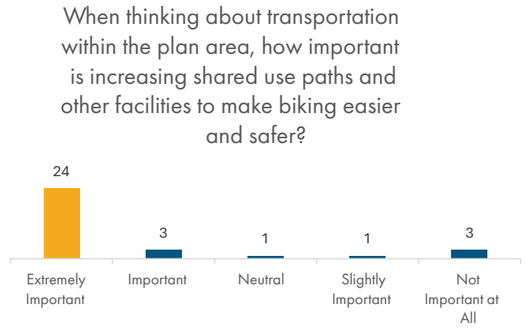
How important is the availability of parks and open space in your neighborhood?

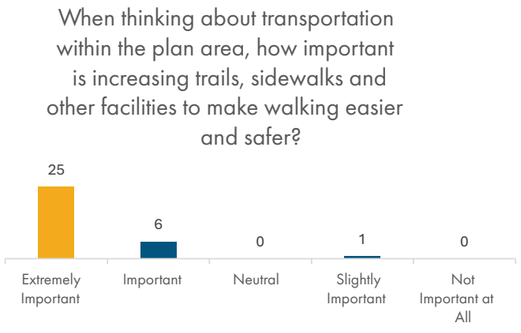


Question #10

When thinking about transportation within the plan area, how important are the following topics?







Question #11

How likely would you be to use trails and other pedestrian facilities in your neighborhood?

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Map Comments

1 Great park with beautiful views and lots of space to wander!

I love Phipps Park for its magnificent views of the valley. I'm glad that we've preserved this land as a recreational area for the city & county to enjoy.

2 Pedestrian

Opportunity to create pedestrian paths for safety

3 Opportunity to ensure bike/pedestrian facilities at new intersection

I hope that the city will put in robust wide sidewalks/ paths at this intersection AND connects this sidewalk to the extensive sidewalk network just to the east.

4 Need pedestrian option between 54th & Molt

The walk/bike path on Rimrock Road ends at 54th street. It should continue along this stretch of Rimrock Road between 54th & Molt.

5 Trails on Rims are an asset to Billings

This trail network is robust and I hope it stays that way! People in surrounding neighborhoods use them all the time.

6 Opportunity for dense, multi-family housing near middle school

Areas within a mile of the middle school should have zoning that allows for dense multi-family, so that more families can take advantage of this new middle school (and WALK there!).

7 Diamond X Restaurant / Brewery

We stopped by on a Sunday afternoon because the truffle fries are to die for! They were having a special buffet (Mother's Day?) so we didn't stay. But the place was packed with families and kids. It felt like a real neighborhood gathering place.

8 Extend bike / walking path

The short section of walking / biking path on the south side of Grand Ave near Trails West subdivision and Ben Steele Middle School could -- and should -- be extended east all the way to Shiloh Rd. This would connect up all existing and future residential developments along Grand Ave to the decent walking and biking path network that exists east of Shiloh Rd all the way to downtown Billings.

9 Safety

Dangerous intersection with deep drop offs. Trucks and long vehicles have difficultly navigating turns to avoid catastrophe and shouldn't pass through intersection

10 Bike/ pedestrian pathways needed

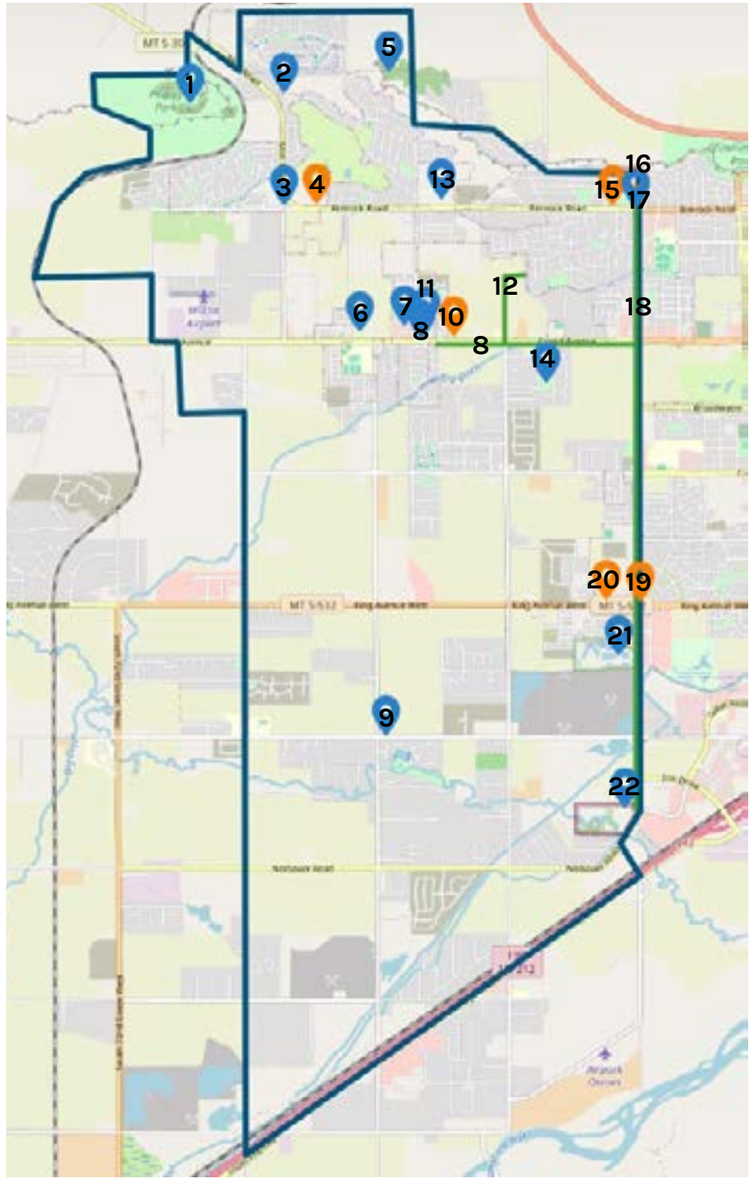


Figure A.1 - Map of Comments

11 Grocery Store

Appreciate having a grocery store here! It would be great to see more neighborhood businesses (cafes, sandwich shops, gyms, etc.) well-integrated into the west-end as development occurs, not just residential construction.

12 48th From Rimrock to Grande

Would love to see Rimrock connected to Grande via 48th/46th somehow someday.

13 Well-used walking path -- need more like this in Billings!

So many people use this walking path along Rimrock Road, and I've love to see more in Billings! It feels safe and comfortable because it's set back and not directly alongside the road & high-speed traffic, and it's wide enough for lots of walkers and bikers to share the path.

14 Great park and gathering space

lots of football and soccer practices going on here

15 Traffic heading into town on Rimrock needs to be slowed down

there's a school just south of RImrock on 38th. We need a way to keep kids and other pedestrians safe on Rimrock between 46th and 38th. Flashing lights to warn that speed limit decreases from 45 to 35; speed humps; school zone on Rimrock. And other good traffic calming ideas should be implemented.

16 Zimmerman Trail

My residence apparently missed being in the "West Billings" area by a few blocks interestingly. The concern is Zimmerman Trail a very significant conduit for the "West Billings" area. The speed limit is 25. No one seems interested in going 25 and if you do, you have a host of vehicles tailgating your rear bumper. Even in ice and snow. Where is law enforcement? Frankly I don't care if the speed limit is 50 but I imagine if it were, there would be tailgating vehicles wanting to go 60...around blind curves, indifferent to potential obstructions such as fallen rocks, indifferent to road conditions...WHERE IS LAW ENFORCEMENT?

17 Need walking path up Zimmerman Trail

This proposed trail would be an incredible opportunity to connect people who live below Zimmerman Trail with all of the beautiful parks & amenities on top of the Rims. People would use this all the time.

18 Bike path

love the bike access here. would love to see more trees/ shade and better cross walk markings since billings drivers don't know how to use pedestrian intersections

19 Pedestrian nightmare

Shiloh Crossing is largely inaccessible for people walking/biking from all neighborhoods. People drive SO FAST through the roundabouts that I would never feel safe crossing there as a pedestrian.

20 Dangerous experience for pedestrians

I have seen people try to walk from the Divide Bar & Grill back to their apartment north of King Ave. They had to sprint across the road and clearly didn't feel safe in the roundabouts. More people should be able to walk from the apartments north of King and west of Shiloh to all of the amenities at that interchange. The roundabouts feel extremely unsafe. Perhaps there can be a pedestrian light somewhere on both Shiloh and well as on King for people to stop traffic & cross?

21 Love this area!

We love walking around this area. We need more places like this in Billings!

22 A Billings treasure!

We love Zoo Montana! It's a gathering space AND a local landmark!

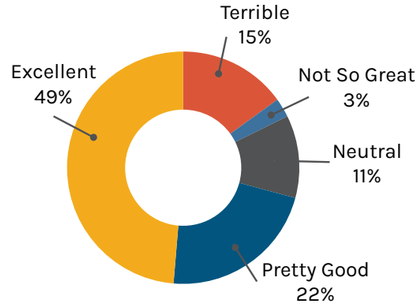
Public Engagement Phase 2: Guiding Principles Survey

The guiding principles survey was available on the project website from XX to XX and was noticed by the project team to the project mailing list and public via XX. Results of the survey showed broad approval of the draft guiding principles, which serve as an update to the 2001 guiding principles. The results of that survey and detailed responses are included here.

LAND USE

Land Use Goal #1

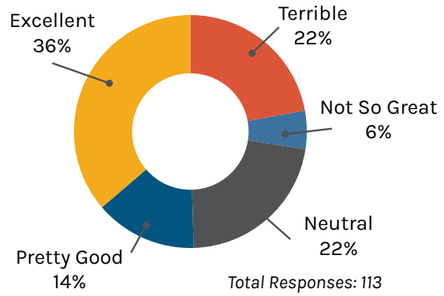
Grow responsibly by encouraging density and pedestrian-oriented development adjacent to existing infrastructure



Total Responses: 113

Land Use Goal #2

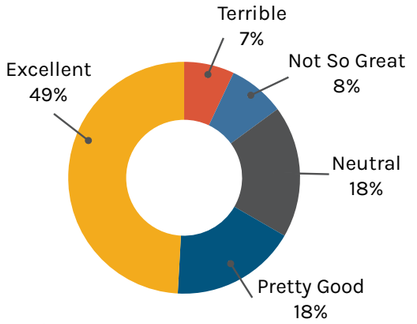
Support diverse housing options for all income levels



Total Responses: 113

Land Use Goal #3

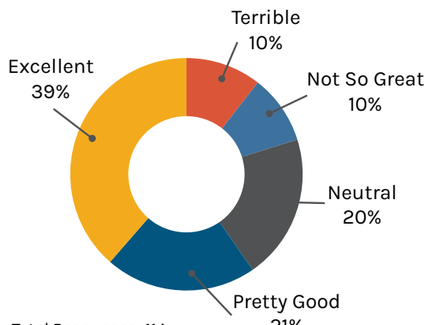
Preserve agricultural lands in the County



Total Responses: 114

Land Use Goal #4

Establish transition areas between urban, suburban, and rural areas



Total Responses: 114

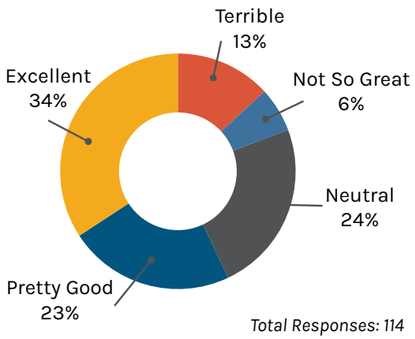
RANKING LAND USE POLICIES BY PRIORITY

Figure A.2 - Land Use Goals

COMMUNITY VITALITY

Community Vitality Goal #1

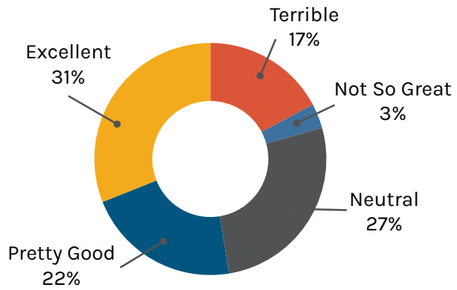
Identify locations and encourage the development of activity centers throughout the neighborhood



Total Responses: 114

Community Vitality Goal #2

Promote mixed-use development where appropriate to strengthen community identity



Total Responses: 116

RANKING COMMUNITY VITALITY POLICIES BY PRIORITY

01 CV 1.1 — Identify areas suitable for community nodes and show locations on the Future Land Use Map

02 CV 1.3 — Discourage strip corridor commercial development

03 CV 1.4 — Use neighborhood parks as anchors in residential areas when appropriate are provided

04 CV 1.2 — Align zoning with node locations to ensure development potential

05 CV 2.1 — Support development of complete neighborhoods that integrate nodes and anchors into the community

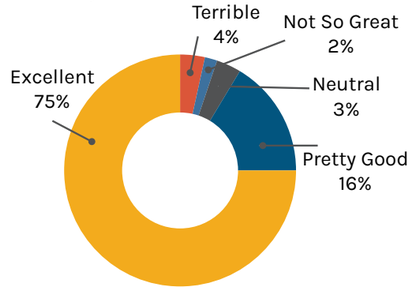
06 CV 2.2 — Support opportunities for mixed-use developments where infrastructure can support it

Figure A.3 - Community Vitality Goals

NATURAL & RECREATION

Natural & Recreational Areas Goal #1

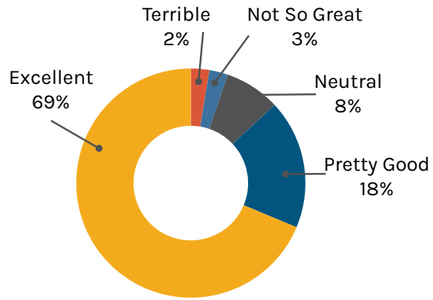
Preserve and protect floodways, waterways, and scenic resources



Total Responses: 116

Natural & Recreational Areas Goal #2

Promote water conservation



Total Responses: 115

Natural & Recreational Areas Goal #3

Connect neighborhoods with interconnecting parks and trails

Total Responses: 117

RANKING NATURAL & RECREATIONAL AREAS POLICIES BY PRIORITY

01 NR 1.1 — Identify and preserve natural areas by limiting development within these areas

02 NR 2.1 — Encourage water conservation through development of landscape irrigation standards and best practices

03 NR 3.1 — Establish an interconnected green space and trail network

04 NR 1.2 — Regularly update and maintain floodplain maps

05 NR 2.2 — Align review of the future land use map with the City of Billings Water Master Plan to ensure that projected growth can be served with municipal water supplies

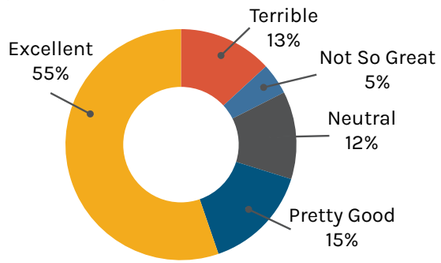
06 NR 3.2 — Support City Parks and Recreation Department in the development of long-range plan for parks and management of those parks

Figure A.4 - Natural and Recreation Goals

TRANSPORTATION

Connected and Multi-Modal Transportation Network Goal #1

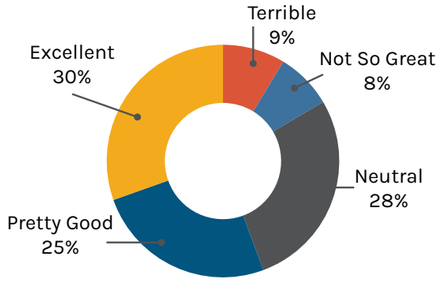
Where appropriate, build a complete pedestrian transport network



Total Responses: 114

Connected and Multi-Modal Transportation Network Goal #2

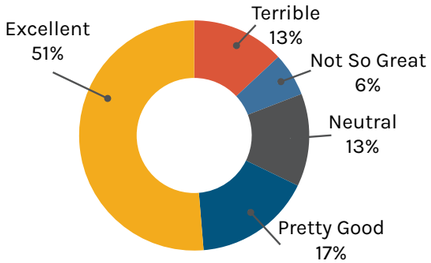
Promote an interconnected street network



Total Responses: 115

Connected and Multi-Modal Transportation Network Goal #3

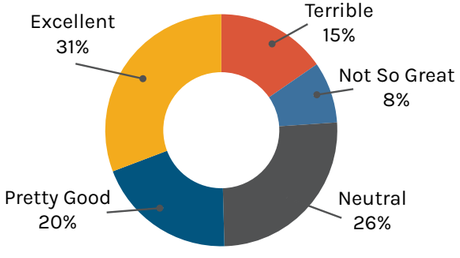
Expand pedestrian and bicycle infrastructure



Total Responses: 115

Connected and Multi-Modal Transportation Network Goal #4

Support transit-oriented development



Total Responses: 117

RANKING CONNECTED AND MULTI-MODAL TRANSPORTATION NETWORK POLICIES BY PRIORITY

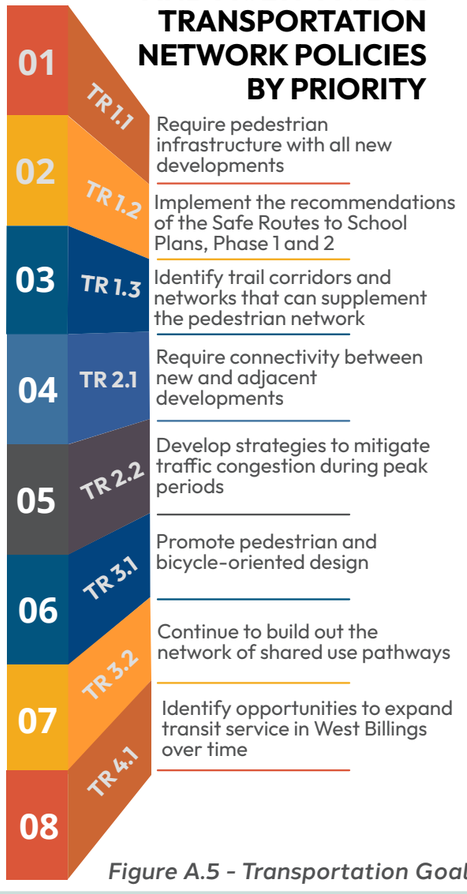
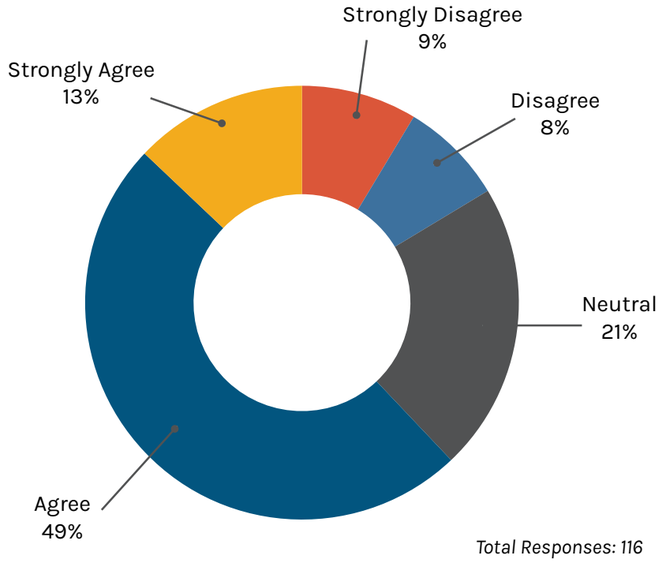


Figure A.5 - Transportation Goals

OVERALL

Do you feel the guiding principles, goals, and policies outlined represent the interests and priorities of the West Billings Community?



Total Responses: 116

Please provide any additional comments or feedback you may have on the guiding principles, goals, and policies.

58 Comments were provided. See following pages for a list of all provided comments.

Figure A.6 - Overall Goals

Detailed Comments:

- I would like to see more storm drainage detention incorporated into open areas and parks. I support trying to narrow up roads so that there is less asphalt and lane width for cars. I support very controlled annexation, not leap frog annexation. There are too many car washes.
- Need to focus more on surrounding areas like Blue Creek and Heights and incorporate more improvements as have been mentioned. Keep developing master plans that focus on outlying ares to relieve stress on Westend. Look to future as to how the merging of Billings and Laurel will look like. Encourage more commercial development around inner belt loop to accommodate the ever growing Heights. MDT and Billings need to finish connecting Highway 3 to Outer Belt Loop system to realize a true truck bypass.
- This was very confusing. When asked ranking on future land map and we don't know what that map looks like. What is a node? We cannot give good feedback if we don't know what you are talking about. Without proper information there is no way we can agree with your recommendations as stated in your survey.
- What Billings needs more than anything else is a plaza where people can gather, eat, drink and relax, this plaza should include public seating, entertainment for the children such as a playful water fountain, possibly converted to ice rink in the winter.
- Where is the update to the west end water study? This will determine where the city needs to grow.
- future improvements to Rimrock, Grand, Broadwater, Central, Monad, King and Hesper should all require complete street standards. the same goes for 48th. 56th. and 64th Stop waiting for the developers to build all the infrastructure. This should be a big enough area to fund major parts of west Billings infrastructure
- Parks and Trails make communities great -- Visited many cities throughout the U.S. and if there is one thing that separates a beautiful city from a not so beautiful city is its Parks and Trails -- People need the outdoors and great access to the outdoors -- Yes, we need police protection but if there were more recreational and open spaces for people to congregate maybe the need for police protection would diminish.
- Plan before you require for all of the above. The city county community has required much of developers without thinking through the next step and that has put us all sorely wanting in many areas. More focus is needed on Bus transportation. Develop bus transportation as an amenity and a benefit. Bus transportation in Billings needs PR work. Currently it has a bad connotation. Start to plan and build, Park and Rides in the west. We certainly need one. Focus locations on those nodal activity centers with mixed use. If you plan it properly, promote it correctly support it effectively with consistent reliable routes and times, then build it. It will be used with favorable experiences, outcomes and can generate revenue and be cleaner for our environment. Best regards, Pat White
- Need to insure that the agricultural sector of what has made this part of Montana great needs to be protected and preserved so that future generations can enjoy.
- All development should require the safety of school children walking to their school!
- I strongly recommend there be mention as a goal some route other than Zimmerman Trail from highway 3 to West Billings! Narrow and fragile Zimmerman Trail cannot continue as the only connector. This issue is out there but apparently not addressed in the west billings plan. Seems like a significant issue that deserves analysis and solutions.
- This survey wasn't always clear - it uses a lot of planning jargon and the untrained citizen taking the survey has to guess at some of the meanings.
- Plans for new subdivisions need to be thoroughly vetted to prevent the build-up of traffic patterns and effects to infrastructure systems. Effects to schools need to be considered as well. There needs to be a new elementary school west of Shiloh. (I do not have elementary children.) I support annexing existing subdivisions before adding new ones.
- Anything that can be done to make Billings less of the personal car-dependent city it is now would be great. Please, no more shopping areas like King Ave W or Shiloh Crossing. How is anyone who doesn't have a car or cannot drive supposed to take care of their commerce needs? And even if one is able to drive to those places, they are ugly and unpleasant to be in - places I go to only when I have to, and leave as soon as I'm done with my business there.
- We need this to also include Western Billings (ie west of Shiloh, and Rimrock)
- Minimize need for private autos for routine school, work, shopping, entertainment
- We need to continue expanding dedicated biking and pedestrian safety access!! Bus transportation ridership is at an all time low! Use smaller buses and use that money for trails!!! Thanks, Jim Sells
- Bicycle and pedestrian trails rate the most important to me.
- It was somewhat difficult to prioritize the policies as they were so interconnected in many cases. It will be important to get buy-in from the City and County planning department the make this a viable and sustainable an. That has been a problem in the past.
- Protect the ability to develop neighborhoods exclusive to single-family homes. Mixed-use is loud, congested, and undesirable for many families.
- The westend needs to rethink intersection type selection. The roundabout at Grand

and Shiloh often has an unacceptable LOS during peak periods. There needs to be a N-S “ring road” constructed before the west end fills in too much (72nd perhaps) with adequate shoulders and clear zones. All new neighborhoods need, at a minimum, a sidewalk along all major roads and the county/city should prioritize adding sidewalk to all road improvement or expansion projects. Water quality on the far west end is poor and should be prioritized in future city water expansion projects. My priority is not community centers, intricate trail networks, or public transportation. My priority is safe roads in all conditions, multiple routes to each neighborhood (redundant access), and simple/straightforward safe pedestrian connection between currently isolated neighborhoods along major roads.

- We have lived off of Niebauer and 45th for 30 years in the Harvest Subdivision - this subdivision and the Wells subdivision were the only two subdivision past Shiloh when we moved there. We moved there to be out of Billings and in the agricultural area. Piece and quiet, minimal traffic - no traffic noise - lots of wildlife. We are sick of the semitruck, contruction pick-ups and rude drivers who go faster that the speed limit. We can barely get out of our subdivision safely due to 20 fold traffic. We can hear cars drag-racing on the weekends on Hesper and Shiloh from our backyard all the way form Niebauer. It was wrong for the county to let developers build 4 story apartment houses by the medical school. I monitored weekly crime reports for a year - we had little or no crime this end of town until they built the apartment houses off 48th and King and developed the hotels/motels by the Holiday station on Gable. I noticed also that the high density apartment developed north of Grand between the Cemetery and Shiloh - the crimes reported are always in the apartments. I realize development is inevitable but I feel Billings should have learned from the western part of the state having commercial development on Shiloh to be similar and standardized. The car wash on King and Shiloh looks like a Disneyland ride. I do want to congratulate the county for the job they did with the Ponds across from the Mall on Shiloh are absolutely wonderful and help make our areas safer from flooding. When we moved to Harvest - there were no trucks allowed on Niebauer from the old Shiloh overpass to 56. They need to return to that.
- Having dedicated bicycle and walking paths is crucial for numerous reasons that impact both individuals and communities positively. Here are some key points highlighting their importance: 1. Promoting Health and Fitness: Bicycle and walking paths encourage physical activity, which is essential for maintaining a healthy lifestyle. Regular walking and cycling can help reduce the risk of chronic diseases such as obesity, heart disease, and diabetes. They provide a safe space for individuals of all ages to exercise without the worries associated with vehicle traffic. 2. Environmental Benefits: Encouraging walking and cycling can significantly reduce the carbon footprint of a community as it decreases dependency on fossil fuel-powered vehicles. Paths through natural areas can foster a deeper appreciation for the environment, encouraging more sustainable lifestyle choices. 3. Enhancing Community Connectivity: Bicycle and walking paths help to connect different parts of a community, making it easier for people to access shops, schools, and other public places without the need for a car. They promote social interactions and build a sense of community as people meet and engage with each other while walking or cycling. 4. Safety and Accessibility: Dedicated paths improve safety by separating cyclists and pedestrians from motor vehicles, reducing the risk of accidents. They make it more accessible for people with disabilities who may use wheelchairs or other mobility aids to navigate public spaces. 5. Economic Advantages: Increased foot and bike traffic can benefit local businesses, as cyclists and pedestrians are more likely to stop and visit shops compared to those in cars. Investment in walking and biking infrastructure can increase property values and attract new residents and businesses to the area. 6. Reducing Traffic Congestion: By providing alternative transportation options, bicycle and walking paths can help reduce the number of cars on the road, thus alleviating traffic congestion and reducing travel times for everyone. Implementing and maintaining bicycle and walking paths is an investment in the future, promoting a healthier, more connected, and environmentally-friendly community.
- Strip malls should not be allowed. Encourage unique small businesses only. Encourage preservation of agricultural lands and natural resources.
- Billings has some great walking and biking paths in place but we need to ensure these are expanded as the city continues to expand westward. It’s crucial to preserve green space an open areas as billings continues to grow.
- Growth in this city generally has been without thought. It has created a city that is difficulty for non-vehicle traffic to navigate for both commuting and recreation purposes. It also has caused the elimination of agricultural lands and green spaces, which provide critical environmental, social, and financial services to the city and individuals. Currently, the city seems to be trying to remedy those issues on the back-end, which is more difficult and expensive. As the city inevitably grows, let us not commit the same errors we did and plan expansion to be people-first rather than commercial profit first.
- Stop overcrowding areas
- This is the same “feel good” legislation hyperbole that I witnessed in Colorado in the 1990s. Typical superfluous wording that addresses noting except the “growth for growth sake’ which is the idealogy of the cancer cell. The Front Range of Colorado is a perfect example of this type of ridiculous guidelines.

And look what a overcrowding disaster of traffic and and endless subdivision growth it has become. My wife and I left Colorado 28 years ago to escape these type on nonsensical guidlines for unlimited growth. And now it is time to leave Billings for how bad the traffic and crime have become. i.e. Rimrock Road during morning and evening commute and the endless building of subdivisions on the west end. Stephen & Cheryl Gies 4041 Pine Cove Rd.

- I don't see the words "safe or safety" in any of the guiding principles, goals, and policies. Safety in everything is and should be the City's number one priority.
- I'm deeply concerned about Billings's direction. Our city should focus on preserving our agricultural heritage and maintaining our unique Montana way of life. However, the rise in crime and the push for developments like 15-minute cities threaten the safety and character of our community. We need to prioritize the needs and values of our residents, not emulate the problems of the East and West Coasts. Let's work together to find solutions that benefit everyone and keep Billings a safe, prosperous place to live.
- Stop building and taking away natural, untouched lands. Billings is too big already.
- West Billings needs to focus on the expansion of roadways and traffic control. Main corridors should have speed reduced, additional traffic control and turn lanes. King Ave, Central, Grand and Rimrock should be expanded to 4 lanes of traffic and the speed limit should not exceed 40 MPH on all roads east of 62nd. Ditches should be covered, and traffic safety should be a high priority to reduce dangerous shoulders. In lieu of extra wide pedestrian trails, a 3' to 4' sidewalk should be encouraged. Road Bicycle traffic should be accommodated on the main roads through dedicated, protected, bike lanes on the shoulders.
- It's critical that development of the West Billings Neighborhood give full consideration to the impacts of increased growth on the adjacent neighborhoods to the east. In particular, the City must develop a safer and more pedestrian-friendly transportation plan.. Rimrock Road for instance is already over-burdened during commuting hours.
- Add Beauty... There is no beauty in Billings. There is no plan to add BEAUTY in Billings. We add parks, but with no beauty. Look at Centennial. It was built NOT as citizens requested, but as a couple of guys wanted. Big dog park and big athletic fields. Take a hard look at progressive cities. They have parks with huge flower gardens, children's recreation, trees, benches, paths, open spaces for fun activities, not organized jocks sports so that old guys can coach and re-live their youth.
- We need more cafes and restaurants on the west end.
- To extent possible encourage development of housing on smaller lots. Walking and biking need to be top priorities. I've met and friended most of my neighbors out walking. Need safe walking and biking corridors to connect corridors and keep children safe. More speed bumps and other design features such as mini traffic circles should be encouraged to slow automobile traffic to safe speeds. To many people driving +40 MPH on side streets in existing sub-divisions.
- You folks have a difficult job. Each and every subdivision and development has its own set of challenges so attempting to come up with a one size fit all approach will be impossible. It would seem that providing some guidelines for developers would be beneficial but each submission will need its own review and oversight. Should there be additional requirements on developers requiring additional expenses, trail development, park maintenance, there should be some financial relief in another part of the process. This is almost headed toward new subdivisions becoming HOA's so as to be able to make the requirements affordable to the property owner and the City. It all, eventually, boils down to cost. Please be mindful of the fact that additional development costs will result in additional property acquisition costs. Not that it can't be done but it will require a good deal of flexibility when reviewing submissions. Higher value development, higher cost of improvements, lower value, lower cost. Without this kind of approach there might only be one type of developed offering. Maybe 2, middle and upper.
- I disagree with the notion of smooth transitions between urban, suburban and rural. The city should have a "hard edge" as annexations and developments are built out. Thankfully our economy and community continue to grow. The alternative is to contract and die. Therefor today's edge will soon be one, five, even ten miles inside the city's border in the future. A smooth transition locks us into a sprawling suburban city that is very expensive to serve and protect. How vibrant will our neighborhoods be when the city's population is 175,000, 250,000 and 350,000?
- I think a better question would be whether the West Billings guiding principles, goals and policies are supportive of the rest of Billings. In other words, does this plan help or hurt, support or undermine, the overall city infrastructure, parks, public safety services, transportation networks, schools? Will these goals support a fair and inclusive community? or create a wider gap in quality of life between neighborhoods that are not in "West Billings"?
- We currently sell parks established n new builds as money isn't available to establish, maintain, or provide safety; why would we designate more for sale?
- Thanks for this opportunity to comment on Billings future. I look forward to receive new communication.
- Planning for growth is essential, maps and zoning leading the way. Infill should be given priority to limit sprawl , mixed housing, safe avenues (cars, bikes,

pedestrian) incorporated in future expansions are essential, green spaces (parks, recreational areas, and trails) planned/enforced in new developments, and public transport options available to decrease traffic congestion if feasible.

- I'm not sure if this is within your wheelhouse, but I don't think that further development should be considered until we have addressed adding in schools to the mix. Billings' continued growth will not be sustainable if families do not have schools to send their children. Thank you for all of your hard work!
- Really want to see more density and more mixed use areas for west billings
- I am aware that Transportation, roadways, arterials, etc, are considered under the auspices of a different group BUT development impacts the neighborhoods along Rimrock Road, a neighborhood street and arterial. To have a meaningful plan I believe it necessary to address Transportation issues with West End Planning. Bike trails and recreational responsibility revert to the Recreation and Parks Department, a maliciously underfunded department. If these amenities are wanted, there should be a way to have residents receiving the benefits bear the cost.
- The trail system in Billings is used by a very small percentage of th population. We don't need all of these neighborhood parks. They are also used by a small percentage of the population.
- Main concern is the inevitable increase in crime while providing additional parks and pedestrian access to neighborhoods as is the case found with existing parks, trails, etc...as well as the lack of funding and resources to police these areas or make arrests
- Too much concern about trails, bike paths, and parks. Concentrate on too much traffic on too few street, too many traffic violations, and too much unpunished crime in Billings. With our record of being the 17th most dangerous place to live in the U.S. , we should stop spending time on trail, bike paths, and parks. Safety and law enforcement should be the priorities!
- Dense population cause water shortages. Respect the West.
- This master plan is excellent. Carrying it out might not be possible due to limited funding.
- develop a large regional park on west end, the size and quality of PIONEER PARK. one section\ show agriculture , and urban forest Billings Lakes and Zoo Montana should have a park adjacent. include rail handcars for exercise and to relate to City railroad history perhaps two parallel for races, on rims or large west end FRONTIER park. see Monterey Bay Railroad handcars, revolution trail rail cars, velocipede, or even on rimrocks ! draisibe railexplorers.net
- Billings is growing way too fast, and it appears Montana planning is not able to handle it. For example, our taxes were raised yet new buildings/homes taxes were not even billed. The state is still trying to figure that one out. Planning is not conducive to the lifestyles Billings natives have lived here for and kept all our lives. Billings natives are being forced to give up our lifestyles that we have kept for years to the greed of developers wanting to fill every space of land in our town with buildings/apartments/ crowed homes/car washes. We do not speed. The fast drivers are here and were not here before. When it says 35 mph it does not mean 50. When a light is red it means STOP, not go ahead fast. Yellow lights mean to slow down not speed up. I would encourage the city to employ more police to sit on our main streets and ticket these guys before any more money is put into our infrastructure. Take care of what has been developed before continuing on with what you are doing unless your goal (whoever you are that is doing this) is another California freeway life. Do not pile home projects into land that will destroy our natural way of life. The traffic is insane. And now developers want to put more housing past Copper Ridge. The Zimmerman apartments are an example of how developers are destroying our west end. When is it going to start being realistic and actually look at what kind of lifestyles need to be preserved, rather than running over and destroying ours, catering to the rich and those who do not give a damn about our community values. A bike path is not going to take care of that. Paths are great, but they do not address the problems of heavy traffic, speeding cars, water shortages/ increasing costs, Water shortage needs to be addressed. Building more houses is not an answer right now. It appears new residents in the past 2 years need to be educated on our traffic expectations just like we had to learn the rules of how to manage round abouts. Although there are still many who think the faster you go around it the best way to do it. Please stop the madness and just start controlling what has already been developed, keeping long time citizens in mind while doing it.
- Speed limits on the west Billings area are from 20 years ago. 45 mph on King, Rimrock, Cental are ridiculous for the amount of traffic we have now. Safety is a thing of the past. Hopefully roads and speed limits in the new developments and current are changed to reflect the current times.
- There have been several long range plans over the last 40 yrs which in large part have been ignored or were non-specific/non-enforceable. There have been some good things--trail system, Shiloh roundabouts and mixed use development, housing development in downtown, E-Bird improvements; however the inability of the County/ City/School Dist to coordinate and the concentration of LG apartment development--ie King Ave w of Shiloh, the current similar situation between Grand & Poly w of Zimmerman.
- Please, please prioritize walkable, bikeable development that doesn't rely on cars as a means for mobility
- prioritize the safety of our kids, schools, neighborhoods--restrict commercial and multi use commercial--no more 3 story apartments w/ retail on the bottome. No more projests where 8 4-plexes and 32 condos are planted 5' from my fence and property line.

Public Engagement Phase 3: FLUM

FLUM Workshops, November 2024

In November of 2024 city staff and consultants noticed and held public meetings at the regularly scheduled West End Neighborhood Task Force meeting on November 12 at Connections Church and on November 13 at a special open house at Ben Steele Middle School. At both meetings, consultants gave a presentation on the purpose of the Future Land Use Map (FLUM) and the statutory requirements of the FLUM. Examples of maps adopted in other cities of differing scales including Georgetown, TX; Overland Park, KS; and Bozeman, MT were also presented. Consultants also explained the land use categories that had been reviewed and approved by the steering committee at that stage in the project and the GIS suitability analysis described in the Future Land Use Chapter. Attendees were also directed to boards where they could give input on the draft guiding principles that were included in survey 2. Images of those boards with the comments that were written on them are included later in this appendix.

FLUM Game - Sanbell

Members of the Public participate in the FLUM workshop at Connections Church, Nov 12, 2024

FLUM Game - Sanbell

Members of the Public participate in the FLUM workshop at Ben Steele Middle School, Nov 13, 2024

Attendees then broke into small groups to collaboratively create Future Land Use Maps of their own using the FLUM game created by the consultant team. This game included a basemap showing developed lands, the suitability map, and a 25-acre grid as shown in the completed workshop maps in this appendix. Participants were then given paper tiles of each land use category and the corresponding number of dwellings in that area to fill in the gridded map and meet the minimum requirements of MLUPA for accommodation of projected population growth. Those maps are included below.

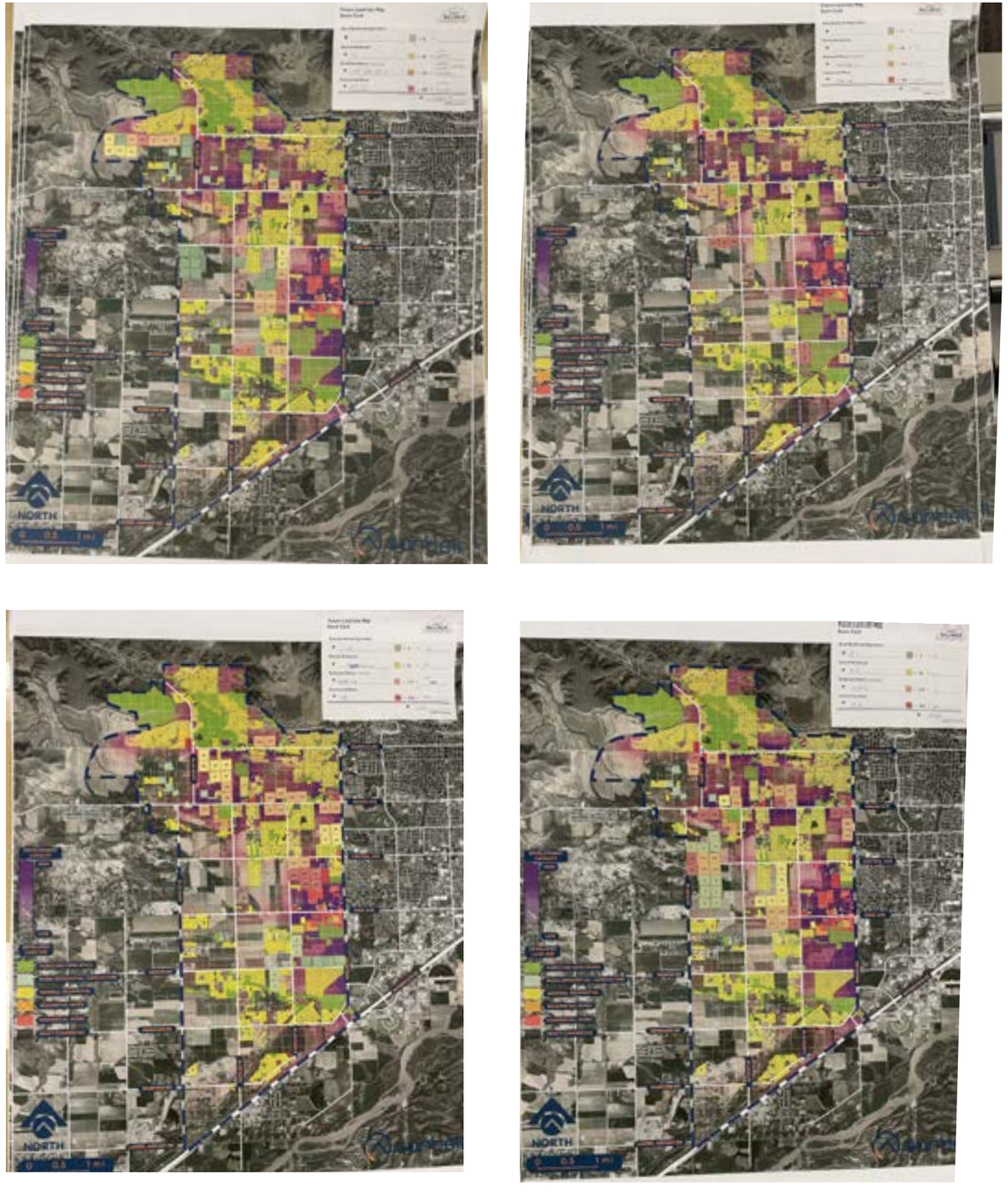
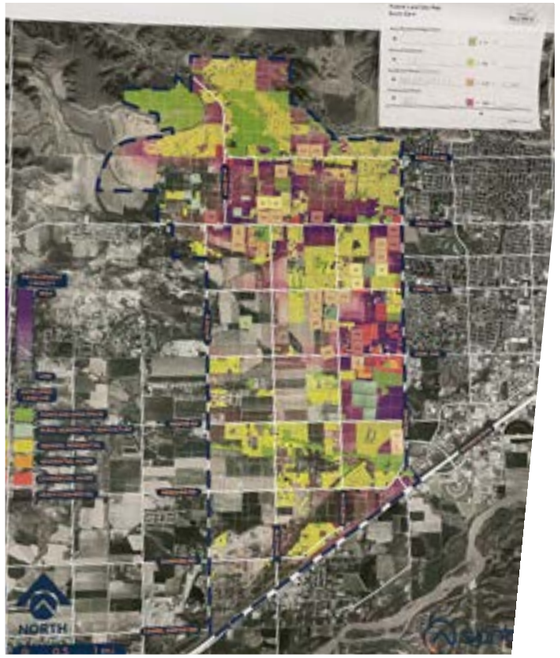


Figure A.7 - FLUM Workshop Maps



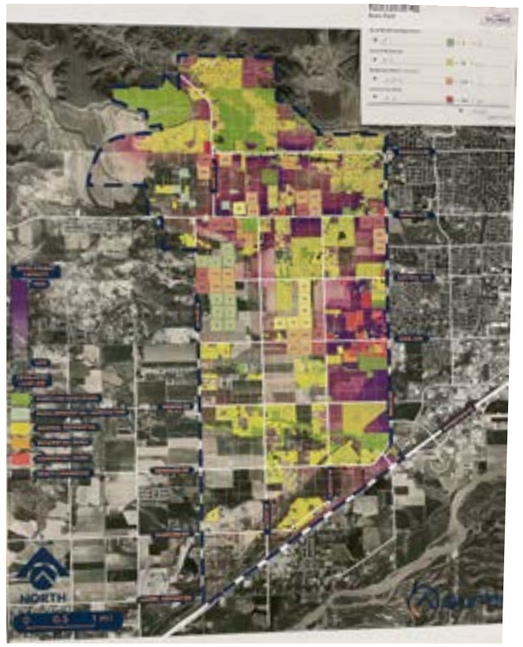


Figure A.7 - FLUM Workshop Maps (Continued)

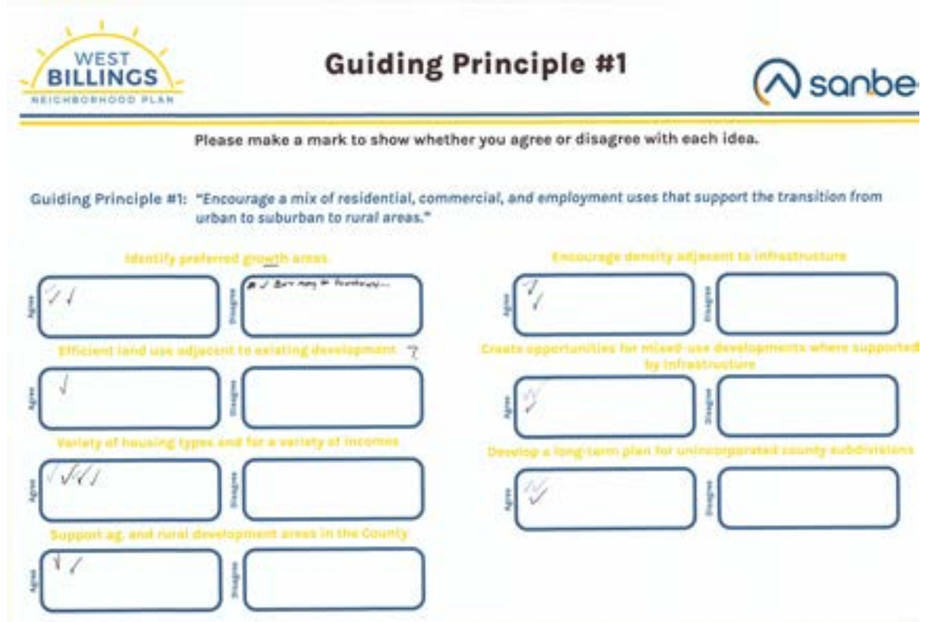
Draft Future Land Use Map

The project team then analyzed the maps created during the workshop sessions and merged them into a draft future land use map, which was reviewed and revised by the steering committee. Public notice for the comment period on the draft FLUM and the August 14 open house was provided via an email blast to the project email list and distribution fliers at several public events in Billings. The draft map was hosted on the project website from July 20 to September 01 of 2025. The webmap received 105 comments, which are included in this appendix along with the project team's responses to each comment.

Draft Future Land Use Map Open House

On August 14, 2025 the project team held an open house at Ben Steele Middle School. Before the meeting began, the project team distributed writing utensils and materials including a copy of the draft FLUM and future land use category descriptions. Attendees were encouraged to write comments on boards which displayed the Draft FLUM, guiding principles, and introductory information presented at the March 2024 open house. The project team gave a presentation introducing the project and recapping the work completed to that date, including the methods used to create the draft FLUM and next steps.

Guiding Principle comments from FLUM workshop Events



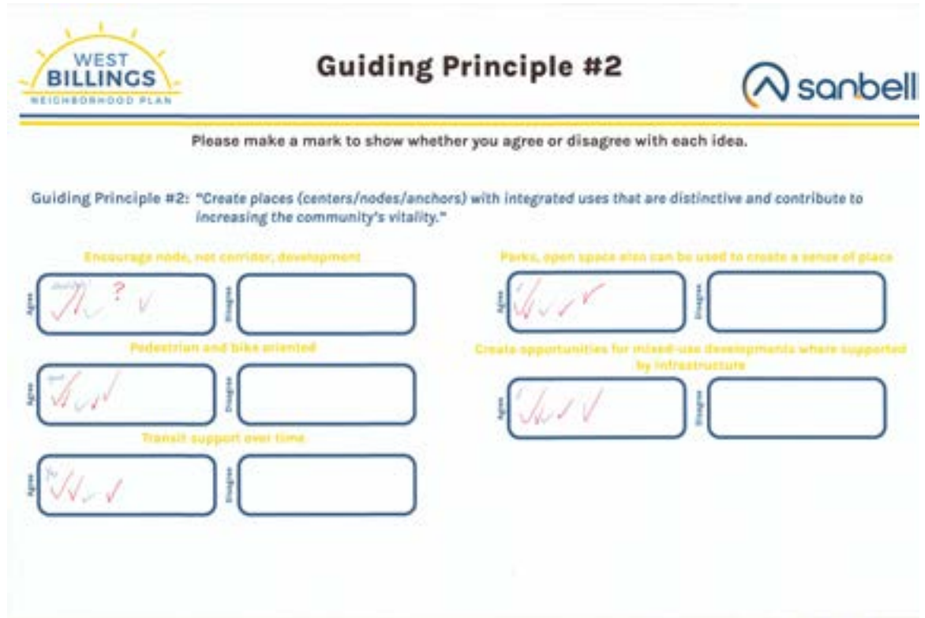
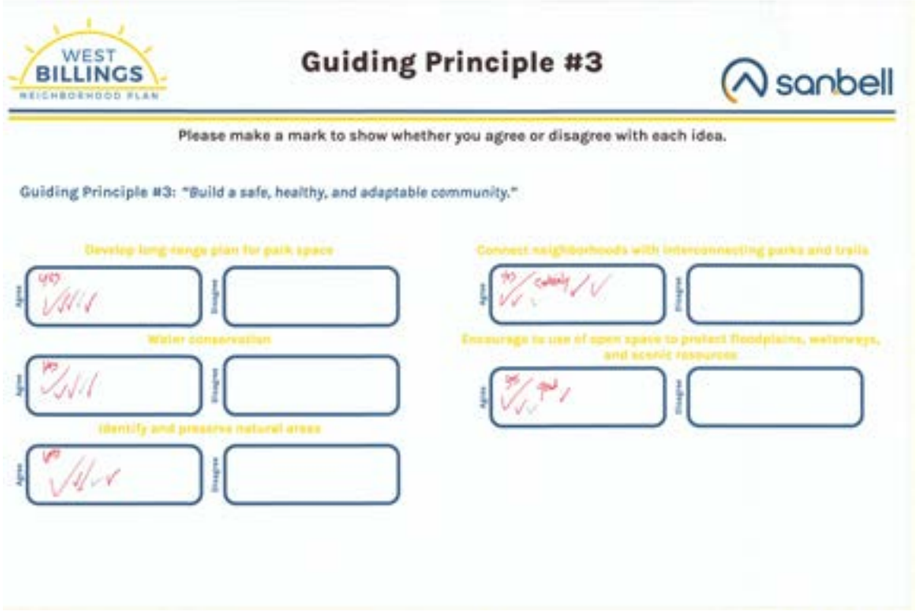


Figure A.8 - Guiding Principle Comments



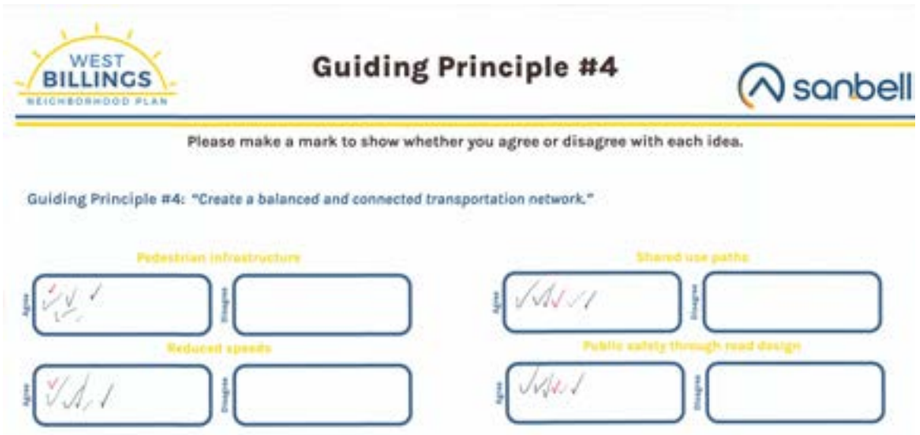


Figure A.8 - Guiding Principle Comments (Continued)

Figure A.9 - Draft Guiding Principles

Draft FLUM Comments and Responses Map Key

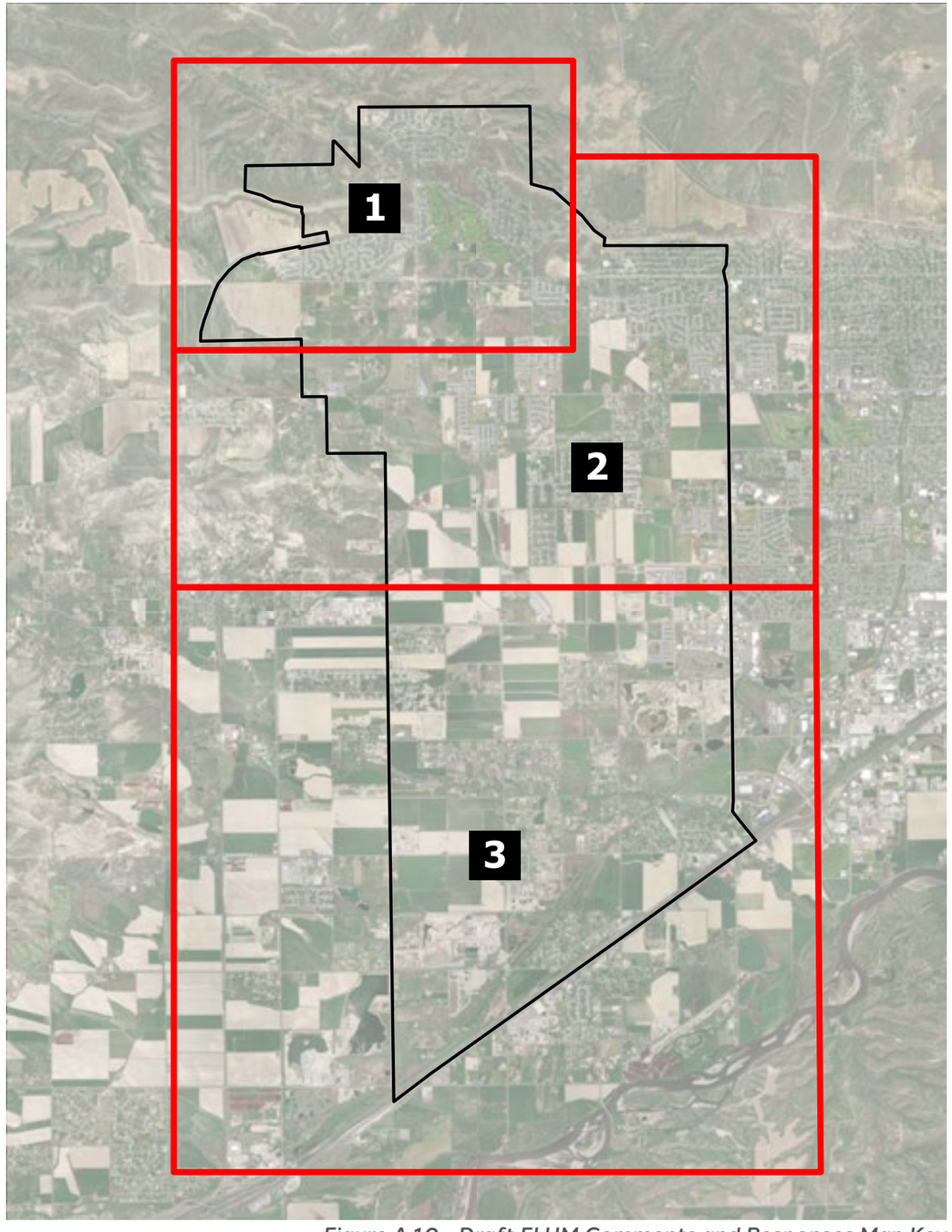


Figure A.10 - Draft FLUM Comments and Responses Map Key

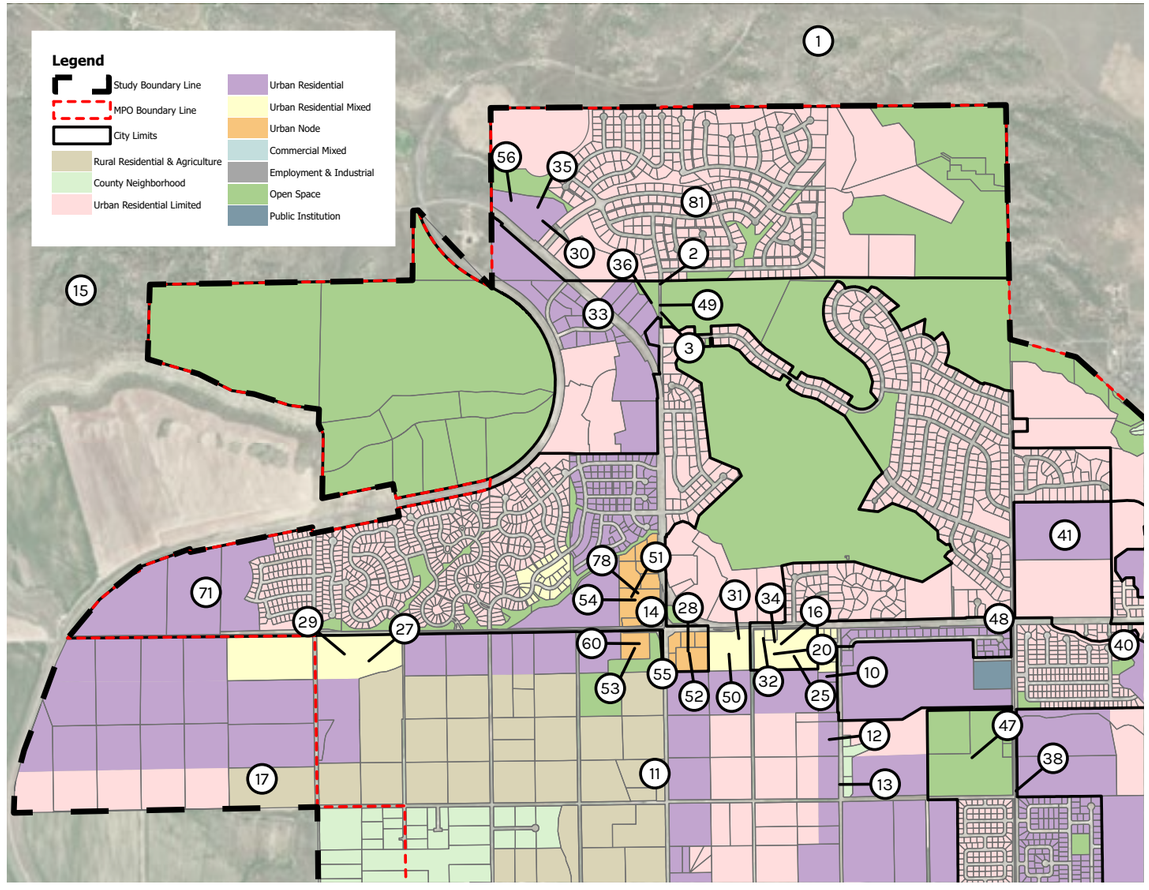


Figure A.11 - Draft FLUM Comments and Responses Area 1

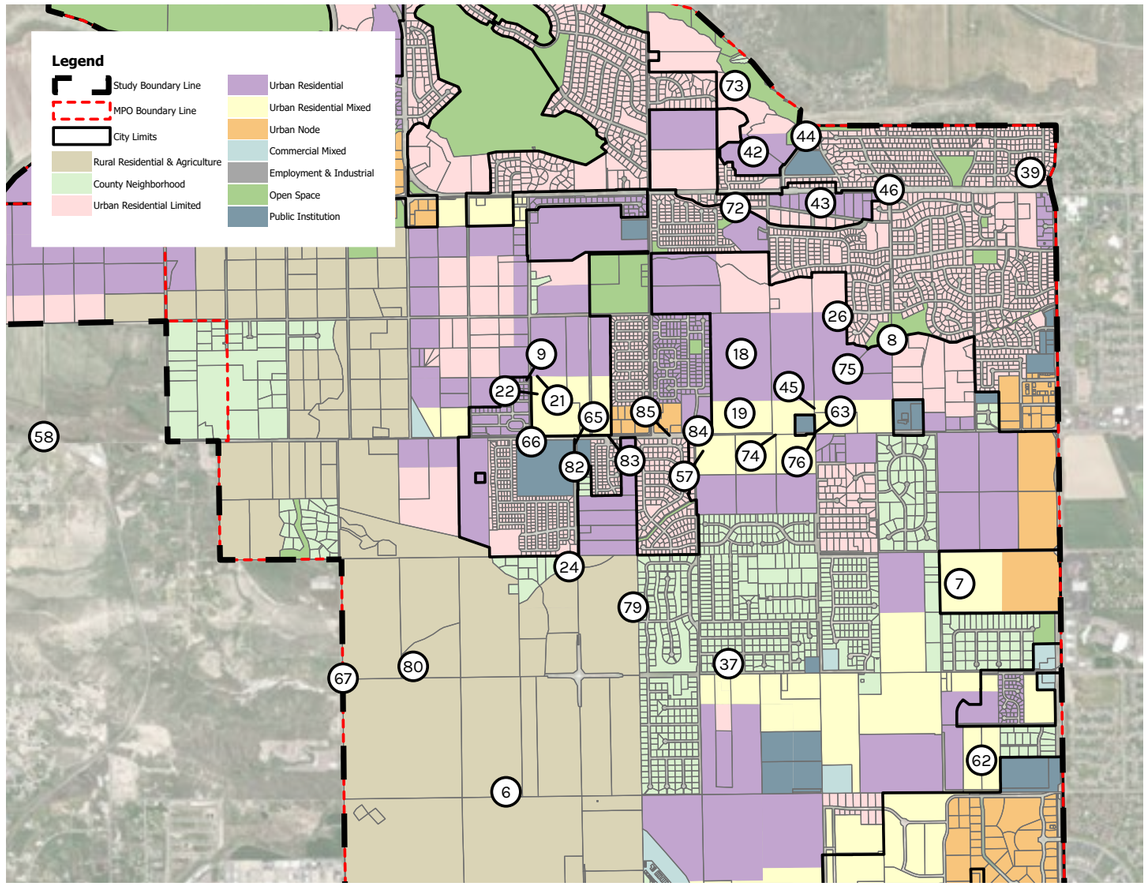


Figure A.12 - Draft FLUM Comments and Responses Area 2

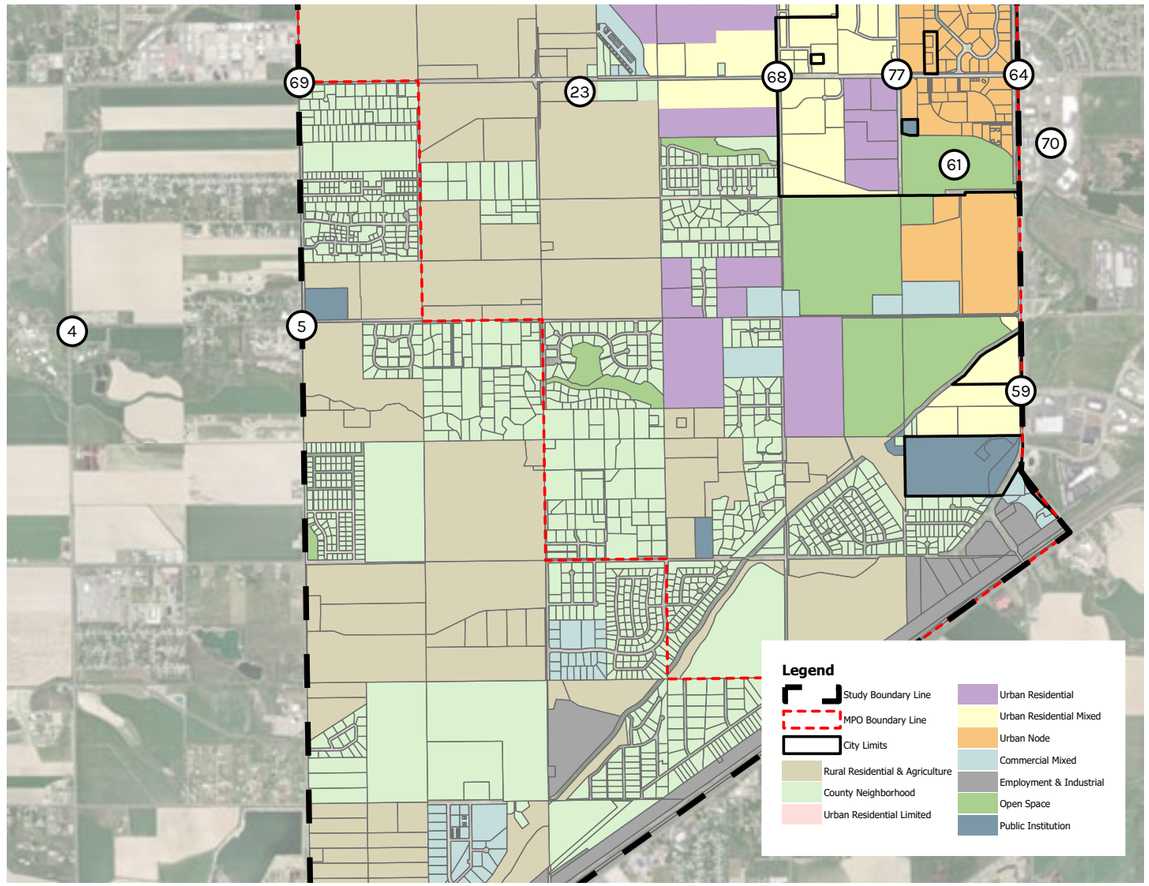


Figure A.13 - Draft FLUM Comments and Responses Area 3

Figure A.14 - Draft FLUM Comments and Responses 1-6

From July 20 to September 1, 2025, community members were invited to share feedback on the Future Land Use interactive map for the West Billings Neighborhood Plan. During this time, we received 85 comments from the public, highlighting local priorities, ideas, and concerns about how the area should grow in the future. Prior to the public map launch, the project's Steering Committee was also invited to provide feedback, resulting in four additional comments to help guide and refine the map based on their community knowledge and experience. Comments 86–105 are not directly pinned on the PDF map because they were submitted outside of the map platform, via email or direct contact with the project team.

Comment ID	Subject	Comment	Public Response
1	New Highway	Build the Molt Rd./Highway 3 Connector as studied in 2016 to lower traffic on Rimrock Rd. and Zimmerman Trail and provide a 3rd route off and on to the Rim Rocks.	Comment accepted. Molt Rd./ Hwy 3 connection included in transportation analysis
2	Keep road closed.	An open and improved road in this location is not necessary. Funds that would be used for the improvement of this road could be better allocated to a more needed project. Opening the road would also lead to an increase in traffic in this lower portion of the neighborhood.	Comment rejected. 62nd to Ironwood is currently an emergency access.It will be developed into a public connection in the future and include pedestrian infrastructure should adjacent property be developed.
3	Keep road closed.	This road should be opened/improve to provide an alternative exit/entrance out of Ironwood or at minimum paved to allow bikers access	Comment rejected. 62nd to Ironwood is currently an emergency access.It will be developed into a public connection in the future and include pedestrian infrastructure should adjacent property be developed.
4	Subdivisions already developed or planned	Why wouldn't already developed and planned subdivisions be included in the plan? At the August meeting, you said that by planning and understanding the type of houses in a subdivision gives you the data needed to plan for how many vehicles each house would contribute to the transportation demands. It cannot cost that much money from your budget to calculate and include pre-existing subdivisions in your plan. To not do so is negligent and is not utilizing the easy data provided. By not using existing data, you are already under planning for the growth that has already incurred.	Comment accepted. New parcel data has been included in the updated Future Land Use Map.
5	Why is the Transportation Map not following actual roads?	It doesn't make sense that the main point of this west end plan is for future transportation and the current developed roads are not used as boundaries	Comment rejected. The boundary of the Multi-Modal Plan Update is set by the MPO jurisdictional boundary, which does not necessarily align to roads.
6	Rural Residential/Agricultural Concern	Comment 1: Land Use Classification The current "Rural Residential / Agriculture" designation conflates two fundamentally different land uses with distinct infrastructure requirements, fiscal impacts, and service demands. Request that the FLUM establish separate categories: (1) "Agriculture" for parcels 20+ acres engaged in bona fide agricultural production, and (2) "Large Lot Residential" for suburban residential development on parcels 1-5 acres. This distinction aligns with standard planning practice and enables accurate cost of service analysis required under Montana Code Annotated 7-6-4127 for municipal service extensions. Comment 2: Fiscal Impact Analysis The plan lacks quantitative analysis of per acre tax revenue generation versus service delivery costs for different density categories. Large lot residential development typically generates $3,000-5,000 per acre in property tax revenue while requiring the same linear infrastructure (roads, utilities, emergency services) as higher density development that generates $15,000-25,000 per acre. Request publication of lifecycle cost analysis comparing revenue to expenditure ratios across all FLUM categories to inform fiscally responsible land use decisions. Comment 3: Water Resource Management Grouping irrigated turf on residential lots with agricultural irrigation obscures significant water demand differences. Residential landscape irrigation typically consumes 2-4 acre-feet per acre annually compared to 1.5-2.5 acre-feet for hay production. Given documented aquifer stress in the Yellowstone Valley, the plan should differentiate water allowances and require separate permitting for non-agricultural irrigation on large lots to ensure sustainable resource management. Comment 4: Transportation and Service Delivery Large lot residential development creates service delivery inefficiencies that increase per capita costs for police, fire, EMS, school transportation, and solid waste collection. The plan should analyze vehicle miles traveled per service call and route efficiency impacts. Additionally, low-density development precludes future transit service and contradicts the city's Complete Streets policy by creating car-dependent land use patterns inconsistent with	Comment Rejected. The intent and assignment of this category means that a parcel will likely not be developed within the city in the next 20 years. This is the only plan, of all the MLUPA plans that will be completed by that City, that includes parcels so far outside the limits of annexation. The designation of RRA is intended to identify areas of the county . Finally, we are unclear on the reference to a repealed portion of MCA and its associated requirement, as a brief search did not return any information. If further discussions are necessary, please clarify.

Figure A.15 - Draft FLUM Comments and Responses 7-15

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7	ag land	"Please separate one acre 'suburban ranchettes' from true Agriculture. Large lot housing should carry its own Low Density Residential label, indexed to a cost of services analysis and excluded from ag water allowances. This change aligns with the City's fiscal stewardship goal, and the adopted Growth Policy directive to encourage development within and adjacent to existing city limits."	Comment Rejected. The intent and assignment of this category means that a parcel will likely not be developed within the city in the next 20 years. This is the only plan, of all the MLUPA plans that will be completed by that City, that includes parcels so far outside the limits of annexation. The designation of RRA is intended to identify areas of the county . Finally, we are unclear on the reference to a repealed portion of MCA and its associated requirement, as a brief search did not return any information. If further discussions are necessary, please clarify
8	Bike path	The bike path ends at Rimrock West. It is possible to ride a bike through the neighborhood to the west as far as about 52nd. A bridge over an irrigation ditch will take you to Rimrock, which has a nice bike path, and from there to 54th, which is great to bike south on; not so much north. There are developing neighborhoods between Rimrock West Park and 54th. It would be good to develop a bike path through this area that connects the existing bike path to 54th. I would appreciate a bike path north of Rimrock on 54th as well.	Comment accepted. The City's Transportation Team will review this comment and take it into consideration in future development of bike infrastructure.
9	58th Zoning Mismatch	This end of the street already has lots of ~0.25 ac, ≈ 4 u/ac	Comment rejected. Existing zoning (N3) is at the low end of the Urban Residential category. Proximity to the 56th and Grand Ave node justifies a higher intensity designation.
10	58th Zoning Mismatch	Typical lot size on this block is ≈1 acre (~1 u/ac). Jumping to 6–16 u/ac is a 6×–16× increase.	Comment rejected. 58th is a future collector and the proximity to Rimrock Rd justify higher intensity designations for the area.
11	62nd St Corridor — Upzone from Rural/Ag	• 62nd St W, ~4 blocks west of 58th, is mapped Rural Residential/Agriculture. • 62nd is the logical place for intensity; 58th has many 1–2 acre lots. • Puts trips on a street built to handle them; reduces pressure on interior blocks.	Comment accepted. Changes have been made to the future land use map to reflect this: D04434 - UR D04435 - UR D04450A - UR D04450 - URM D04451 - URM D04465 - UR D04466 - URM D04478 - UN
12	58th — Vacant Land Next to 1–2 Acre Lots	Adjacent lots are ~1–2 acres (≈0.5–1 u/ac). Proposed category is 6–16 u/ac. That's a 6×–32× jump.	Comment rejected.Zoning designations N3 - NX1 are appropriate for this area.
13	58th Zoning Mismatch	Please adjust the proposed zoning West for 58th Street. Existing homes here sit on lots from ~0.25 ac up to ~2 ac, which is ~0.5–4 units/acre. The proposed 6–16 u/ac would create abrupt, side-by-side intensity jumps next to large-lot homes. ASK: • Remap this segment to a lower-density category (≈2–4 u/ac) • Allow higher densities only closer to Grand and King Avenue. BASIS: • Compatibility: prevent height/mass conflicts next to large-lot homes. • Infrastructure fit: higher density where streets, drainage, and access can handle it. • Predictability: aligns with existing neighborhood pattern while still enabling growth.	Comment rejected. Intersection of 58th and Colton are collectors and appropriate for N3 - NX1 zoning designations.
14	Create a dog park	This could be a great location for a nice dog park.	Comment rejected. This location is already zoned CMU-2 and is adjacent to the intersection of Rimrock Rd and 62nd. Urban Node is an appropriate use for this area.
15	Map legend	Dark, light, colored dashed lines, no idea what each means from the legend.	Comment rejected. The future land use map contains a large amount of overlapping information reducing legibility. This information will be easier to read when overlaid onto GIS.

Figure A.16 - Draft FLUM Comments and Responses 16-25

From July 20 to September 1, 2025, community members were invited to share feedback on the Future Land Use interactive map for the West Billings Neighborhood Plan. During this time, we received 85 comments from the public, highlighting local priorities, ideas, and concerns about how the area should grow in the future. Prior to the public map launch, the project's Steering Committee was also invited to provide feedback, resulting in four additional comments to help guide and refine the map based on their community knowledge and experience. Comments 86–105 are not directly pinned on the PDF map because they were submitted outside of the map platform, via email or direct contact with the project team.			
16	Rimrock Road frontage	I still own and have retained, approximately 60 acres of my original farm property off the SW corner of 62nd W and Rimrock Road. It's a little difficult to see detail on the map, but it appears all of my frontage on Rimrock which is in the city limits is zoned residential, some of it "high density" some "irrigated farmland" with some of the acreage to the south residential limited, whatever that means. A development plan for this acreage could well include some neighborhood commercial/office space. How locked in is the designation of the ground included in this plan? Obviously, once development starts on my ground, and there was a zoning and annexation action started and then pulled on 38 acres this spring, the farming will cease. Unfortunately, I am out of town and unable to meet with you prior to 8/31. Thomas Romine 1128 N 32nd Billings, Mt 59101 406-671-7444 thedrom@outlook.com	Comment accepted. Street frontage on Rimrock Rd is assigned URM, which allows for CMU1, NMU, and NO. Going south on the property the designation of UR allows for NMU and NO. Futher south and then west is assigned URL. This is a wide variety of appropriate zones for the parcels.
17	20 acre site	The subject 20 acre site is bordered on the west by Urban Residential and the South by Urban Residential Limited. The Northon border is 70th street. I would hope that you would consider the including it with one of the adjacent primary zones above. What is the thought of going around it when it has roadway frontage suitable for a slightly more intensive use?	Comment rejected. The parcel is not within the limits of annexation and there are present water and sewer issues to supply that level of development.
18	Active Farm	This is an active working farm and will be for a very long time	Comment rejected. Existing land uses will not be affected by category designation on the future land use map, unless land owner applies for a zone change.
19	Active farm	This is an active farm and will be for a every long time	Comment rejected. Existing land uses will not be affected by category designation on the future land use map, unless land owner applies for a zone change.
20	High density	Why is high density housing being pushed so far away from all services and amenities?	Comment rejected. This area was found to be close to services and amenities in an analysis done prior to developing the future land use map.
21	Continued Discussion	Putting an end to public comment as of 8/30 is in complete disregard to our community. Most people, 100% of the people I have been in discussion with this past week, have no idea this plan is even being floated. The city/county MUST do better in engaging the tax payers. As it sits currently, the proposed plan and the timing, are an embarrassment to the city of Billings tax payers/residents. The lay out of map, the "color coding" and lack of explanation of meaning, screams "we're gaming you". He city needs to back up, take a breath, explain more and quit bullying its citizens.	Comment noted. There are further opporunities to comment and participate during Billings 2045. Please see Billings2045.com. Community Planning week will be the week of November 17th.
22	Schools	It is very concerning that the city/county would consider any type of development without major input/impact statement and plan regarding public schools. The schools on the west end of town have been at max/beyond capacity for years. The continued negligence of this issue, and especially in light of future development of the city, is disgraceful, at best, for the city of Billings. We, and our children, deserve better.	Comment accepted. Public school districts have been engaged as a stakeholder and new public school facilities have been taken into consideration while creating the future land use map and will be addressed in the plan document.
23	test	tset	Test Comment.
24	Trails	Continue developing trails along the easements and ditches	Comment Accepted. Though this comment has no bearing on the future land use map, transportation analysis will include trails recommended along ditch ROWs per the 2023 LRTP.
25	Irrigated farm land	Keep as is	Comment rejected. The future land use designation Urban Residential Mixed is appropriate for the area. It is close to Rimrock Rd and higher intensity development. The land owner has expressed interest in developing in the future.

Figure A.17 - Draft FLUM Comments and Responses 26-40

From July 20 to September 1, 2025, community members were invited to share feedback on the Future Land Use interactive map for the West Billings Neighborhood Plan. During this time, we received 85 comments from the public, highlighting local priorities, ideas, and concerns about how the area should grow in the future. Prior to the public map launch, the project's Steering Committee was also invited to provide feedback, resulting in four additional comments to help guide and refine the map based on their community knowledge and experience. Comments 86–105 are not directly pinned on the PDF map because they were submitted outside of the map platform, via email or direct contact with the project team.			
26	Traffic concerns	Higher density housing here would create a traffic issue through Rangeview Drive. The area just south of Rangeview should be consistent zoning with the area just north of Rangeview Drive	Comment rejected. The category designation Urban Residential is consistent with adjacent zoning (N3).
27	NO to High density multi family	Allowing high density multi family housing in this area will add undo pressure on the already busy traffic on Rimrock and Grand. While both major collector streets can be widened, past experience has proven the city,county and state cant get together to create fluid traffic corridors. It makes no sense to add to the problems by building high density in these areas.	Comment rejected. URM designation creates nodes at smaller scale appropriate to their context.
28	Excellent space from small commercial like coffee shops etc	This area is an excellent location for coffee shops or small retail businesses.	Comment accepted. No action necessary . The current future land use designation Urban Node will allow this type of development.
29	keep open space		Comment rejected. Suitability analysis supports designation.
30	keep open space	keep open space	Comment rejected. The parcel is on an arterial and directly across the street from utilities. Additionally the parcel is within the limits of annexation.
31	leave green space and park	we do not want dense housing in this area.	Comment rejected. This area along Rimrock Rd is appropriate for Urban Residential Mixed designation.
32	Leave open space	do not let rezoning happen. we do not want dense housing here.	Comment rejected. The future land use designation Urban Residential Mixed is appropriate for the area. It is close to Rimrock Rd and higher intensity development. The land owner has expressed interest in developing in the future.
33	Road use	A bike trail similar to that running on the north side of Rimrock between 54th and 46th would be a welcome addition from 54th to Phipps park. Additionally, from 54th to Shiloh along Grand Ave. Let's give cyclists a fair chance at surviving a ride on the west end.	Comment accepted. A bike facility from 62nd to Phipps Park will be included in the long range transportation plan.
34	Keep open space	Road cannot handle more housing development, especially in this particular area.	Comment rejected. Future capacity projects will change the ability for roadways to handle increased traffic.
35	Keep open space	No more building	Comment rejected. This area is appropriate to develop under the future land use designation Urban Residential as it is currently zoned NO.
36	Keep as a fire road	One way in and out of ironwood to keep crime low.	Comment rejected. Multiple access points into development improve public safety.
37	Seperate suburban ranchettes from true ag	Please separate one acre 'suburban ranchettes' from true Agriculture. Large lot housing should carry its own Low Density Residential label, indexed to a cost of services analysis and excluded from ag water allowances. This change aligns with the City's fiscal stewardship goal, and the adopted Growth Policy directive to encourage development within and adjacent to existing city limits.	Comment rejected. This development is Wells Garden Estates and has existing half acre lots. The parcels are designated County Neighborhood.
38	This needs to at least have a center turn lane	As you continue to dump more traffic on this road, at least getting a center turn lane would help	Comment accepted. This will be analyzed in the Transportation Plan portion.
39	This park was disposed / high density opportunity	The city just disposed of this park, if you look at the lot it has good accessibility in the neighborhood and could support large density build	Comment rejected. The City still owns this park, but the recommendation from the committee is to dispose of the park. If the City were to dispose of the park the property designation will be changed. To change the designation before council officially disposes the parcel is misleading.
40	This strip of park is listed for disposal	This park is not accessible by reasonable means (probably by design of the developer) as such it has been listed as a possible disposal site by the city	Comment rejected. The City still owns this park, but the recommendation from the committee is to dispose of the park. If the City were to dispose of the property designation will be changed. To change the designation before council officially disposes the parcel is misleading.

Figure A.18 - Draft FLUM Comments and Responses 41-54

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41	Poor high density placement	In a perfect world (from the words of McCall): "Higher density builds would ideally happen in the front of a subdivision, rather than the back". Attempting to develop this back plot where in you have already established SFR is a bad idea, at best this should be Pink. In this particular case though flipping this Purple with the Pink that sits in front of it might be workable! The Pink, while platted, to my knowledge has not been developed at all yet (no roads) swapping these land plots might help you get to where you need.	Comment accepted. Parcels will be redesignated as follows: D12427 - UR
42	Poor location for high density planning	In a perfect world (from the words of McCall): "Higher density builds would ideally happen in the front of a subdivision, rather than the back". Attempting to develop this back plot where in you have already established SFR is a bad idea, at best this should be Pink.	Comment accepted. Parcels will be redesignated as follows: D04632 - UR
43	All of these lots are county	All of these lots are county and its unclear why this is allowed to be marked as higher use development. Lets for a moment assume that you could up zone these, their only access is directly on to Rimrock Road which would be less than ideal for a highway. Unfortunately keeping these zoned low density is probably the best of a bad situation unless better access from the back was developed.	Comment rejected. Proximity to Rimrock Rd makes it appropriate for higher intensity development. The future land use map does not change current uses. Additionally, Leroy Lane is unconstructed but platted as public.
44	This is not a public park and is marked as such	This is not a public park and the city has been extremely aggressive lately in ensuring that it is well known that this is not open for public access, especially to those who have dogs.	Comment accepted. The following parcels will be redesignated as Public Insitution: D04632B D04634 C08892
45	Better access to the school via Bike/Walk	There is no safe access to the school here, in theory as this road is completed we'd see it, but why not build a trail in the interim?	Comment rejected. The 48th Street West Corridor is a Principal Arterial. Based on the 2016 Bike and Pedestrian Master Plan, a Shared-use Path would be the best option for non-motorized transportation. This project is identified as a project, but no funding is identified for construction or maintenance.
46	Improve crossing at this location	We need some type of crossing here, this is a major connector to trails (big ditch) that is under utilized by those north of Rimrock due to difficult crossing conditions here	Comment accepted. The Transportation Plan will analyze the impact of a crosswalk on this intersection.
47	Attempting to call this greenspace is a farce	There is no plan to develop this into a workable park and in fact from our understanding it is possible for the land to be withdrawn and then redeveloped into housing if nothing is done soon. Calling this green space is a farce.	Comment rejected. The City still owns Cottonwood Park. If the City were to dispose of the property, the designation would be changed. To change the designation before council official disposes the parcel is misleading.
48	Bike lanes should extend out to Copper Ridge	The bike lane should extend out to copper ridge to give alternatives for transportation	Comment accepted. Rimrock Road is currently under design for reconstruction from Clearview to 62nd as with most City arterials a shared use path will be evaluated for inclusion.
49	This road should be opened/improved	This road should be opened/improve to provide an alternative exit/entrance out of Ironwood or at minimum paved to allow bikers access	Comment rejected. This road is not proposed in the Functional Class map as being extended. The road currently acts a secondary emergency access. It will be developed in the future and include pedestrian infrastructure should adjacent property be developed.
50	Single Family Housing Only	Keep this area as single family housing. The only exception should be that this area could be used to build a new elementary school.	Comment rejected. This area's suitability score makes higher intensity development that allowed by the Urban Residential Mixed designation appropriate at this location.
51	Single Family Housing Only	No apartments. Keep as single family.	Comment rejected. Comment would require categorization contrary to existing zoning.
52	Single Family Housing Only	I do not want any apartment buildings in this area keep it to single family housing.	Comment rejected. Comment would require categorization contrary to existing zoning.
53	Residential Land Use Only	Keep this area for Residential Land use Only.	Comment rejected. Lots at the intersection of Rimrock Rd and 62nd is already zoned for commercial use. Limiting other parcels at the intersection to residential only would be inconsistent.
54	Residential Use Only	I am a property owner in this area and I am concerned about future land use, property values and crime. I would like this area to be zoned residential only.	Comment rejected. Comment would require categorization contrary to existing zoning.

Figure A.19 - Draft FLUM Comments and Responses 55-70

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55	Road expansion	If the city wants to continue to add housing developments they also need to consider road expansion. Two lane roads can't sustain the increase in population much longer. Been here for 6 years and every year the morning traffic gets worse and worse.	Comment noted. The purpose of this plan is to address the best locations for development and plan transportation improvements to match.
56	Green Space	This is an excellent area to identify as Green Space. It is in the 100 yr flood plane and a poor area for housing. The west end needs green space and the idea that the Yellowstone country club is included in green space is laughable.	Comment rejected. This area is appropriate to develop under the future land use designation Urban Residential as it is currently zoned NO.
57	Speeding	52nd already has a lot of problem with people speeding. Adding a roundabout will only make the problem worse if 52nd street is fully connected from Central to Grand. The county commissioners have multiple speed studies showing speeds in excess of 55mph (highest recorded was 70mph in a residential neighborhood).	Comment noted. This is not proposed in the FC Map to be extended from Central to Grand, only connection would be internal as development occurs. County has completed speed humps further south.
58	Homewood Park	There is crime and transients in this neighborhood.	Comment rejected. The comment location is outside of the plan boundary.
59	Left turn lane	Left turn lane into costco to alleviate traffic and enter from west side	Comment rejected. Improvements on Zoo Dr (MDT Road) should improve access to Costco.
60	Potential for commerical development	Would be nice to see some services like gas station out here	Comment accepted. The designation Urban Node will potentially provide these services.
61	Dog Poop Paradise	There is a shit ton of dog poop at shiloh.	Comment noted. Not relevant to the Future Land Use Map.
62	This category does not allow existing zoning	test	Comment accepted. N1 is used sparingly on this parcel. The primary zones to be NX2 and NX3 both are available in the current designation of URM.
63	Left turn green arrow	Driving down Grand heading west, please put a left turn green arrow for those turning left onto 48th St W. The traffic really backs up if we're waiting on just one car who can't turn left. Thank you!	Comment noted. This will be addressed in the Grand Avenue Project.
64	Truck route	It would be nice to have a truck route in/out of west Billings for 18-wheelers and other large towing vehicles that avoids roundabouts.	Comment noted. The City has designated truck routes please contact City Engineering Department.
65	56th and Grand	This intersection should be a signal light, not a roundabout. The traffic needs to be stopped to allow school children to cross with a crossing guard. There is a lot of foot traffic near the school . Roundabout are not friendly to those on foot or biking as the drivers driving over the limit and are not looking for people on foot even with the signals. The traffic also need to be stopped to allow a break in the flow to allow side street traffic to access Grand. The traffic flows at a higher speed than posted pushing 55-60 and at some times of the day is constant. It can take 3-5 minutes of waiting to access Grand from 58th going east.	Comment noted. This will be addressed in the Grand Avenue Project.
66	58th and Grand.	58th Street at Grand has become difficult to exit onto Grand as the volume of cars has increased with building west of the Foxtail subdivision. The speed limit is 45, 35 at school times when the yellow light is flashing. People drive this section of Grand closer to 55-60 making it hard to turn left out of the subdivision. 58th has become a cut thur to go to 56th and to the school. Traffic at times is constant and most do not drive 25. Many are in a hurry and drive 50 to get to the school on time. With that speed it is hard to see cars coming as there are parked cars along 58th and Kit south. With the current project of the water pump the traffic has been a lot less but once that is done the volume and speeds will go up again.	Comment noted. The multi-modal plan and Grand Avenue Project will address these issues.
67	visibility issue	the grade on 64th just north of Central creates a blind spot for vehicles on Central turning left onto 64th	Comment noted. This road is managed by Yellowstone County.
68	road issues	this is a very tight intersection for turning vehicles with trailers	Comment noted. This intersection is under construction by MDT.
69	traffic control	this is a pinch point during the school year and peak morning/afternoon hours	Comment noted. Multi-modal tranportation analysis will address congestion and roadway improvements
70	Grocery store	We need a grocery store in this area.	Comment accepted. The designation Urban Node will potentially provide these services.

Figure A.20 - Draft FLUM Comments and Responses 71-82

From July 20 to September 1, 2025, community members were invited to share feedback on the Future Land Use interactive map for the West Billings Neighborhood Plan. During this time, we received 85 comments from the public, highlighting local priorities, ideas, and concerns about how the area should grow in the future. Prior to the public map launch, the project's Steering Committee was also invited to provide feedback, resulting in four additional comments to help guide and refine the map based on their community knowledge and experience. Comments 86–105 are not directly pinned on the PDF map because they were submitted outside of the map platform, via email or direct contact with the project team.

71	Urban Residential	What exactly is urban residential vs. urban residential limited? Does that mean apartment building can be constructed? We fought with a developer a year ago to stop that but apparently it doesn't matter?	Comment accepted. Future land use designations are defined by zoning permited within the desingation. This informaiton is available on the project website.
72	Add strip of open space to along ditch to connect to this park	Preserve the popular path along the irrigation ditch to connect to this neighborhood park. This provides open space continuity between this neighborhood and the Rim Rock West neighborhood and open space along the Big Ditch Trail.	Comment noted. A proposed trail connection to the existing Big Ditch Trail Corridor is proposed to the south of this location.
73	Preserve Public Open Space	This area contains very natural area along the base of the rims, including some popular trails that have been used for decades. This should remain open space; consider adding as a park.	Comment rejected. It is inconsistent to designate this as open space as it is private property. That being said, the designation Urban Residential Limited does not stop someone from using this as recreation.
74	Add Separated Multiuse Pathway Along Grand Avenue	Grand Ave has no pedestrian access. Biking access is unsafe with the narrow shoulder and high volume and speed of traffic. Adding a separated multiuse pathway would residential neighborhoods in this area to other paths. It would also provide a safe route to Ben Steel Middle School and the Christian schools, which could alleviate traffic during morning rush hour, which is particularly congested along Grand Ave from Shiloh to 56th.	Comment accepted. The Grand Ave right-of-way is planned to include biking facilities.
75	Strip of Open Space to Connect Path to Grand	Consider a strip of open space along the ditch to connect the Big Ditch Trail to a multiuse path along Grand. This can be used by kids for safe biking/walking access to Ben Steele Middle School as well as other trail users.	Comment accepted. The trail is identified in the LRTP.
76	Traffic signal	Need protected turn going south on 48th. All traffic is held up going west on Grand for people waiting to turn	Comment accepted. The Grand Avenue Project will review traffic patterns and determine intersection control for this location.
77	Needs traffic circle	This intersection is becoming impossible to turn left safely. There are so many apartments here, competing with King Ave traffic. Please put a light or a traffic circle.	Comment accepted. MDT is in the process of putting a roundabout at 48th and King Ave.
78	Urban node	What is an urban node and what types of development can be built?	Comment accepted. Future land use designations are defined by zoning permited within the desingation. This informaiton is available on the project website.
79	Stupid	Destroying irrigated farm land for housing developments is just stupid. The city should be expanding north and south in the dryland areas, not where we grow our food. Or better yet, let's not expand. As the city grows, crime goes up and the quality of life goes down. Taxes go up and services go down.	Comment noted.
80	Separating Rural Residential and Agricultural	Please separate one acre 'suburban ranchettes' from true Agriculture. Large lot housing should carry its own Low Density Residential label, indexed to a cost of services analysis and excluded from ag water allowances. This change aligns with the City's fiscal stewardship goal, and the adopted Growth Policy directive to encourage development within and adjacent to existing city limits."	Comment Rejected. The intent and assignment of this category means that a parcel will likely not be developed within the city in the next 20 years. This is the only plan, of all the MLUPA plans that will be completed by that City, that includes parcels so far outside the limits of annexation. The designation of RRA is intended to identify areas of the county . Finally, we are unclear on the reference to a repealed portion of MCA and its associated requirement, as a brief search did not return any information. If further discussions are necessary, please clarify
81	One acre designations	One acre residential allotments should not be categorized as "residential/AGRICULTURAL. It is a misnomer to label them agricultural especially if they will probably only house 2 people! There is a potential real loss of property taxes along with a waste of services for a few residents. "Please separate one acre 'suburban ranchettes' from true Agriculture. Large lot housing should carry its own Low Density Residential label, indexed to a cost of services analysis and excluded from ag water allowances. This change aligns with the City's fiscal stewardship goal, and the adopted Growth Policy directive to encourage development within and adjacent to existing city limits."	Comment Rejected. The intent and assignment of this category means that a parcel will likely not be developed within the city in the next 20 years. This is the only plan, of all the MLUPA plans that will be completed by that City, that includes parcels so far outside the limits of annexation. The designation of RRA is intended to identify areas of the county . Finally, we are unclear on the reference to a repealed portion of MCA and its associated requirement, as a brief search did not return any information. If further discussions are necessary, please clarify
82	Traffic circle with realignment north to colton and rimrock	Student traversing north on grand should be re-directed to existing crosswalk north of ben steele. Students crossing from the east should have a new crosswalk developed ~500 ft south of the intersection of 56th and Grand.	Comment accepted. The Grand Avenue Project will review traffic patterns and determine roadway elements that include non-mtorized.

Figure A.21 - Draft FLUM Comments and Responses 83-97

From July 20 to September 1, 2025, community members were invited to share feedback on the Future Land Use interactive map for the West Billings Neighborhood Plan. During this time, we received 85 comments from the public, highlighting local priorities, ideas, and concerns about how the area should grow in the future. Prior to the public map launch, the project's Steering Committee was also invited to provide feedback, resulting in four additional comments to help guide and refine the map based on their community knowledge and experience. Comments 86–105 are not directly pinned on the PDF map because they were submitted outside of the map platform, via email or direct contact with the project team.

83	Should not allow cross street	Daybreak should not continue north to Colton. Alignment from 56th should be adjusted to traverse north to alleviate through traffic on 58th. Major North South Streets are every 8 blocks 32nd (40th aka Shiloh), 48th, 56th, 64th, 72nd, 80th.	Comment accept. Daybreak Dr is not planned to be extended to the north.
84	Traffic Circle Advised	Another dangerous intersection. Vintage estates should be right turn only, additionally, road block @ Vinyard and Burlington should be removed. 52nd should be paved with access to Vintage Estates and the subdivision south. 52nd should be considered a minor city road such as Rehberg ln. There are a lack of north south streets in this area.	Comment accepted. The Grand Avenue Project will review traffic patterns and determine roadway elements that include non-mtorized.
85	Traffic Safety Concerns.	Opportunity for "Right Turn Only" leaving Albertsons with a traffic circle @ Grand and 54th. There have been several injury accidents at this intersection since the exit from Albertsons was installed.	Comment accepted. The Grand Avenue Project will review traffic patterns and determine roadway elements that include non-mtorized.
86		Will the speed limit be reduced on Rimrock - east of the new roundabout. Traffic is crazy	Comment accepted. As Rimrock Rd is built out, a reduced speed limit will likely be evaluated.
87		If the yellow line is for transportation why aren't you following existging roads - Same w/ MPO lines	Comment accept. MPO Boundary is currently being evaluated in a separate project. The Federal Highway Administration requires MPO Boundary to follow urbanized areas, which is why the MPO Boundary does not follow roads.
88		Need more east west corridors (capacity and safety) that don't just go through residential neighborhoods	Comment noted. There is a future funcitonal class map for new development and consideration.
89		We need another way onto Hwy 3 than zimmerman sooner rather than later This is a safety issue similar to what drove the IBL for the Heights	Comment noted.
90		Would be better to have more shared use paths where pedestrians & cyclists are buffered from vehicles	Comment accepted. Bike and pedestrian facilitieswill be evaluated for inclusion on all future collector and arterial right-of-ways.
91		When doing the planning for growth areas - PLEASE consider the impacts to the established neighborhoods. Traffic safety Pedestrians/ Bikes	Comment noted. That is the goal of the transportation portion of this plan.
92		<3 this Annafeld/ Josephine crossing is a decent start b1 mixed use needs to be even more integrated - less car-centric	Comment accepted. The goal of this plan is to create areas of both mixed use and centralized commercial spaces. This will create areas that are less car centric. Comment refers to guiding principle 2 "small commercial/ retail businesses should be allowed in neighborhoods as opposed to pushing all commercial activity to major intersections."
93		Why such a big push for high density so far from the city	Comment noted. The area shown is likely to become a part of the city one day and has been identified in the limits of annexation map. Planning far into the future will allow for better development overall.
94		Need more open space! 40% of open space on map is Yellowstone Club	Comment accepted. Open space designations describe the main overall use of that entire area. Parks and open spaces will still be developed within the other designations.
95		Area Should be pink. Urban residential Ltd.	Comment rejected. The existing zoning and suitability analysis supports category designation.
96		My primary comment is there is NO accompanying explanation for the Land Use Categories. While my "insider" knowledge gives me an idea of what each category entails, no meaningful comments can be made by the West Billings residents without a better "explainer" on each category. How are they supposed to know what an Urban Node means? I am certain there will be misapprehensions and misinterpretations of each of these categories.	Comment noted. The project website and future outreach will continue to educate the public on the placetypes.
97		The future Urban Residential that brackets several county residential neighborhoods north and south of Hesper Road. This presents an inherent conflict boundary. Is there a designation for County Neighborhoods that implies a future annexation category?	Comment noted. The intent of the County Neighborhood future land use placetype is to identify neighborhoods that have already been established in the County. This placetype does not preclude or conflist with the annxation map or policy.

Figure A.22 - Draft FLUM Comments and Responses 98-105

From July 20 to September 1, 2025, community members were invited to share feedback on the Future Land Use interactive map for the West Billings Neighborhood Plan. During this time, we received 85 comments from the public, highlighting local priorities, ideas, and concerns about how the area should grow in the future. Prior to the public map launch, the project's Steering Committee was also invited to provide feedback, resulting in four additional comments to help guide and refine the map based on their community knowledge and experience. Comments 86–105 are not directly pinned on the PDF map because they were submitted outside of the map platform, via email or direct contact with the project team.			
98		There are no substantive Urban Node designations beyond the 1/2-mile west of Shiloh Rd. While there is the Urban Residential Mixed that courses along many primary arterials this provides limited opportunities for neighborhood and commercial services. For example, will 56th St West and Central Avenue stay Rural Residential and Agriculture for the next 20 years? The SD #2 High School land (40 acres) at 48th ST W and Monad will spur the need for adjacent services as well as draw the traffic volumes that encourage commercial interest in nearby land. But there is no plan for this future land use except for Urban Residential and Urban Residential Mixed to the north.	Comment accepted. Parcel D00466A has been changed to URM to better serve a future High School.
99		There needs to be a chart of land area designated for each category. E.g. total area is 14,000 acres: 8,000 acres designed as Rural Residential and Ag; 2,560 acres designated Rural Residential; 1,280 acres designated Open Space; etc...	Comment accepted. A chart has been created to show overall designation amounts and will be included in the final plan.
100		The limits of annexation boundaries need to be shown.	Comment accepted. There will be a separate map within the final plan showing the annexation boundary.
101		The map should have an interactive version so several planning layers can be shown - annexation, zoning, MPO boundary, functional class of roads, etc. without having to flip from tab to tab to see how this all layers together.	Comment noted. Future implementation of the land use map into the City's GIS should create this opportunity.
102		The Neibauer property south of Neibauer Rd between S 48th St W and S 44th St W will be a prime property for further Employment and Industrial or Commercial Mixed Uses. While the parcel is outside the limits of annexation (null area), the city's water supply line to the new reservoir at Hesper Rd goes up S 48th St West.	Comment accepted. Parcel D00903 changed to Commercial Mixed, and parcel D00902 changed to Employment and Industrial.
103		Properties north and south of Elder Grove School will become County Neighborhoods eventually. Probably not stay Rural Residential or Ag.	Comment rejected. The County will not followthe future land use map. Since the parcel is 20 acres the designation of RRA is appropriate.
104		How does this future Land Use Map line up with the Westend Multi-Modal Plan for corridor and intersection improvements?	Comment noted. The boundaries are different between MPO limits and Westend Multi-Modal Plan for corridor and intersection improvements.
105		The scale of the map is incorrect. Each section is 1-mile square. The scale implies otherwise. The scale should reflect common measures - 1/4-mile, 1/2 mile, 1 mile.	Comment accepted. The future land use map scale has been adjusted.

APPENDIX B

FUTURE LAND USE MAP PRODUCTION METHODS

Appendix B Contents

Future Land Use Map Production Methods. 206

MLUPA Compliance 210

Future Land Use Map Production Methods

Suitability Analysis

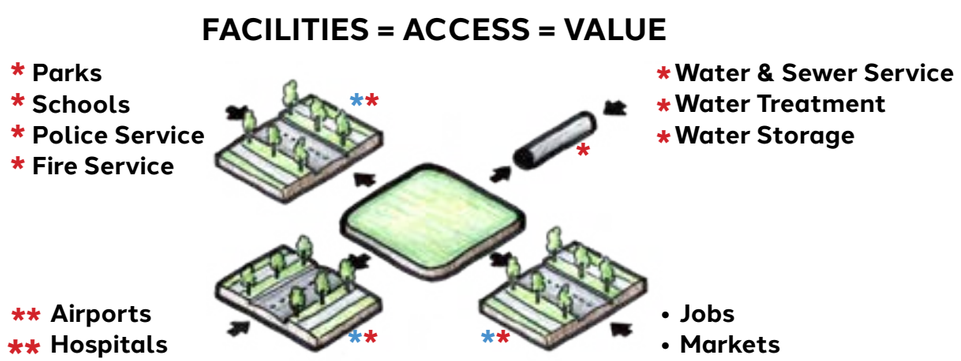
Once the plan themes had been updated, the consultant team and staff began the FLUM drafting process by analyzing where within the study area development is appropriate and likely to occur. Many factors influence where, when and how land is developed, the most influential is access: access to jobs and markets via public transportation facilities like roads, and access to services like water and sewer, schools, parks, police and fire protection. Land with more access is better suited for more intense development than land with less access and is likely to develop sooner. To model that suitability, the consultant team analyzed proximity of land within the plan area to twelve different factors. Each was given a different weight multiplier and distance variable in rough proportion to its influence on development. For example, proximity to a point of interstate access is more influential than proximity to an unscheduled City of Billings capital improvement project. (Figure B.1 Suitability Heatmap Methods, Equations, Weights)

The twelve factors analyzed are as follows:

1. Interstate Access
2. Water Mains (12"+)
3. Schools
4. Limits of Annexation
5. Commercial Address
6. Principle Arterials
7. Minor Aterials
8. Collectors
9. Projects (CIP)
10. Projects (Unscheduled)
11. Residential Density (15+ units per acre)
12. Residential Density (6-15 units per acre)

Those proximity factors were added together in the ArcGIS raster calculator to create a comprehensive heatmap of suitability. (Figure B.2 Suitability Heatmap)

Lastly, developed land and flooplains were removed from the suitability heat map. (Figure B.3 Suitability Heatmap with Undevelopable Land Removed) The remaining area was treated as developable for the purposes of MLUPA compliance.



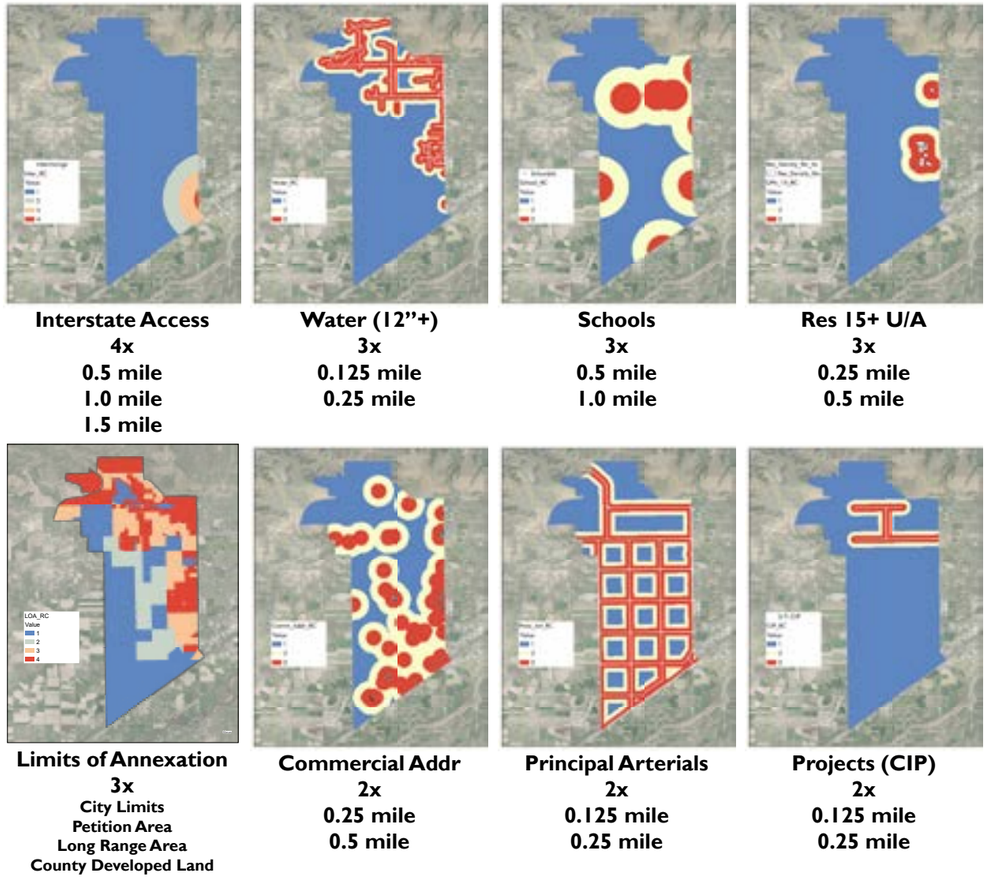


Figure B.1 Suitability Heatmap Methods, Equation, Weights

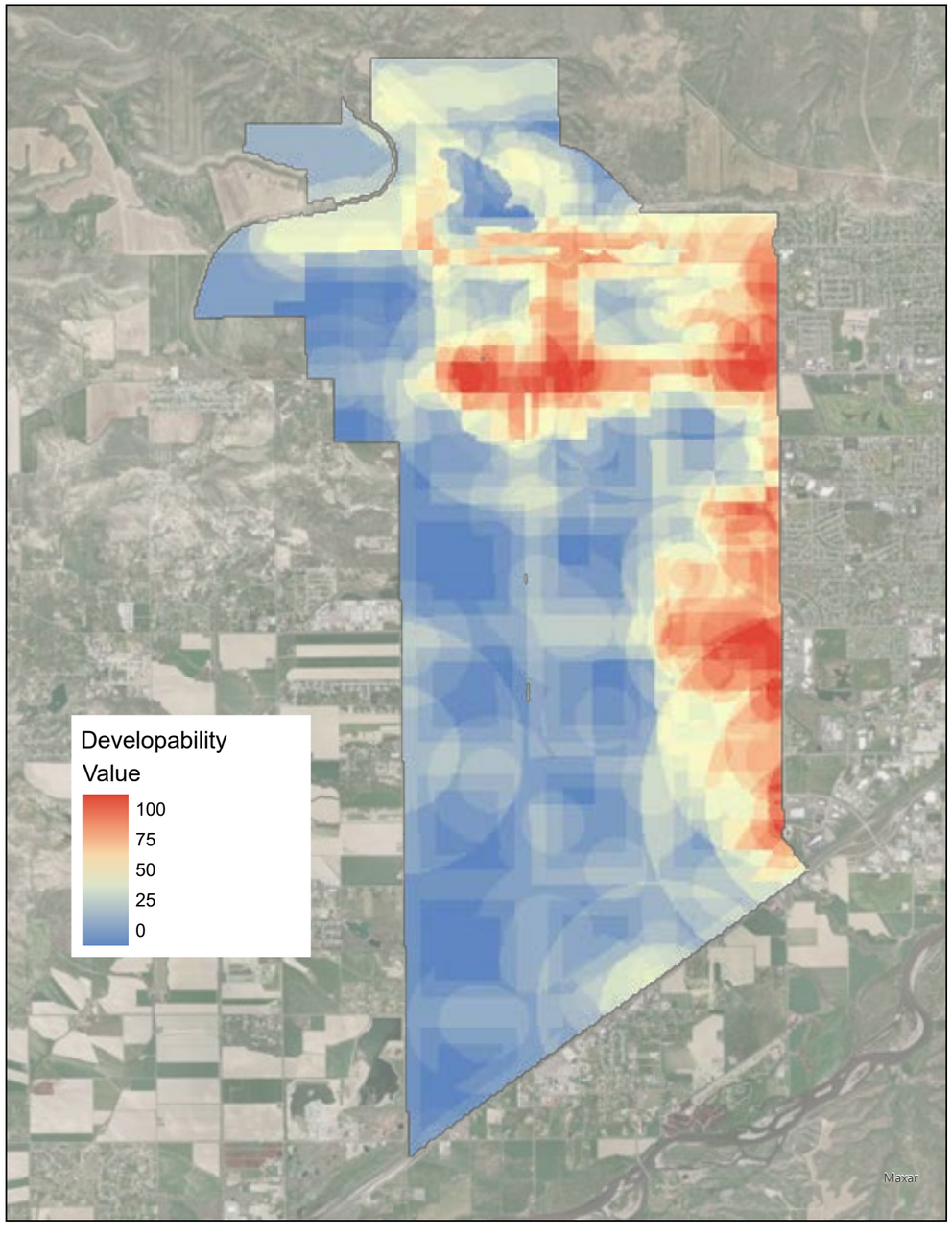


Figure B.2 Suitability Heatmap

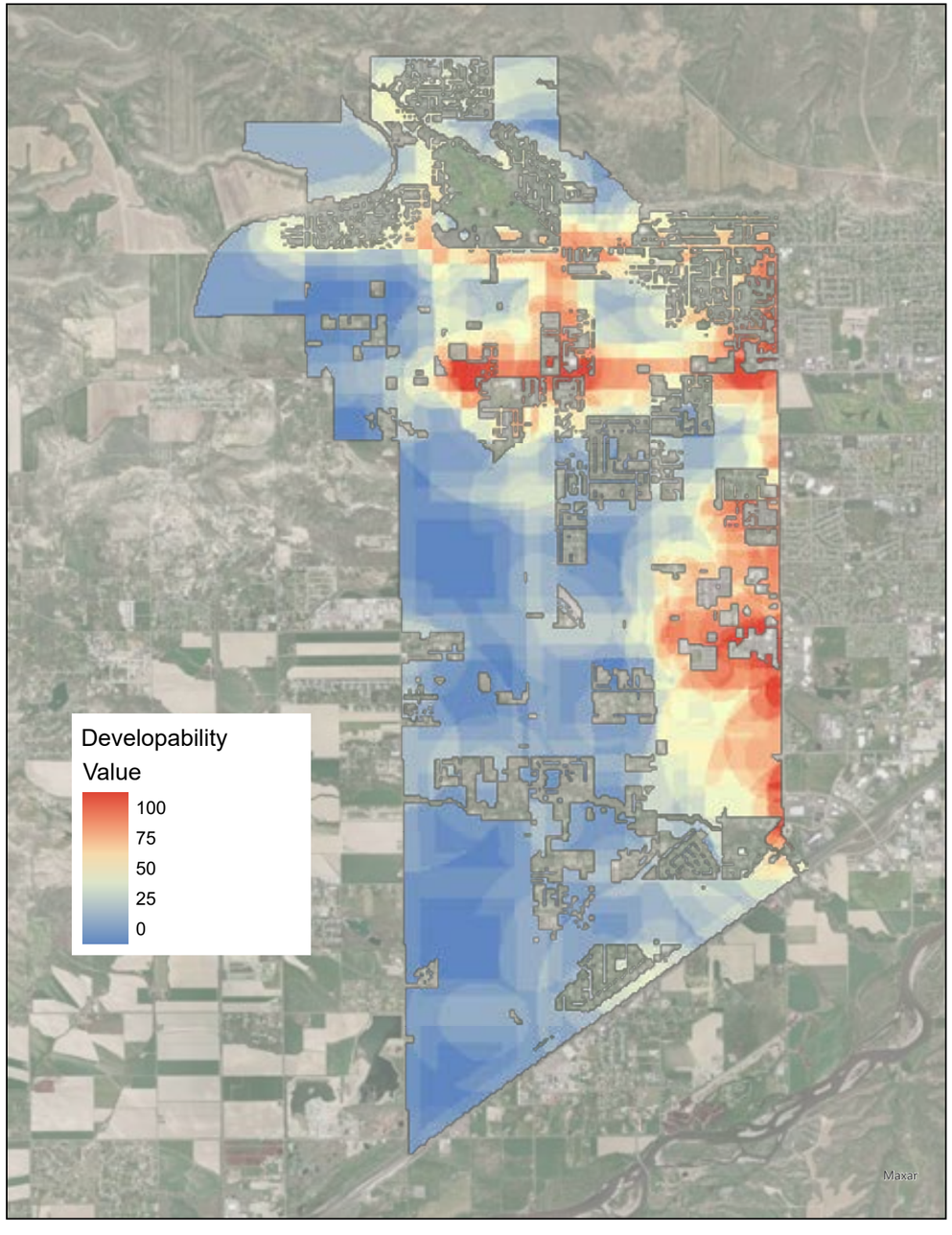


Figure B.3 Suitability Heatmap with Developed Land Removed

Suitability Analysis Conclusions

The suitability analysis of undeveloped land within the plan area gives us a useful model for what land is likely to develop first, what land has better access and supports more intense uses, and what land will be more cost effective to provide municipal services. The final suitability heatmap was used as a basemap for public FLUM workshops held in November of 2024 where participants created their own future land use maps in a game detailed in Appendix A.

The project team then used the suitability heatmap, the public workshop maps, the updated guiding principles and all public input gathered to that point to create a MLUPA-compliant draft Future Land Use Map.

FLUM Game - Sanbell

Members of the Public participate in the FLUM workshop at Ben Steele Middle School, Nov 13, 2024

MLUPA Compliance

The Montana Land Use Planning Act (MLUPA) places many requirements on this plan, known as a Future Land Use Plan, and the Future Land Use Map it creates. Details of all aspects of this plan's MLUPA compliance are provided in Chapter 7. Aspects of the FLUM's compliance with MLUPA which influence its production are provided here.

76-25-213. Land use and future land use map. (1) A land use plan must include a future land use map and a written description of the proposed general distribution, location, and extent of residential, commercial, mixed, industrial, agricultural, recreational, and conservation uses of land and other categories of public and private uses, as determined by the local government.

The future land use map is included in Chapter 3 of this plan. Figures and text describing the future land use categories are also included in that chapter.

(2) The future land use map must reflect the anticipated and preferred pattern and intensities of development for the jurisdiction over the next 20 years, based on the information, analysis, and public input collected, considered, and relevant to the population projections for and economic development of the jurisdiction and the housing and local services needed to accommodate those projections, while acknowledging and addressing the natural resource, environment, and natural hazards of the jurisdiction.

The future land use map in Chapter 3, Future Land Use, was developed in accordance with the public input and updated guiding principles established through the public input process. Natural resources, the environment, and natural hazards were specifically excluded from this planning process at the direction of City/County Planning staff. Those considerations will be addressed in the overall Billings 2045 plan document.

Population Projections				
	2000	2021	2045 Projected	2020-2045 Change
Study Area	6,226	16,182	30,770	14,588
MPO Planning Area	112092	142,358	190,986	48,628
Housing Needs				
	2000	2021	2045 Projected	2020-2045 Change
Study Area	2,155	6,644	13,444	6,800
MPO Planning Area		58,815	78,814	20,000
*Assumes a 30% capture rate of population growth and new housing units				

Figure B.4 Population and Housing Growth Projections

Population Projections

Section 76-25-213(4)(c) requires that the FLUM identify the following:

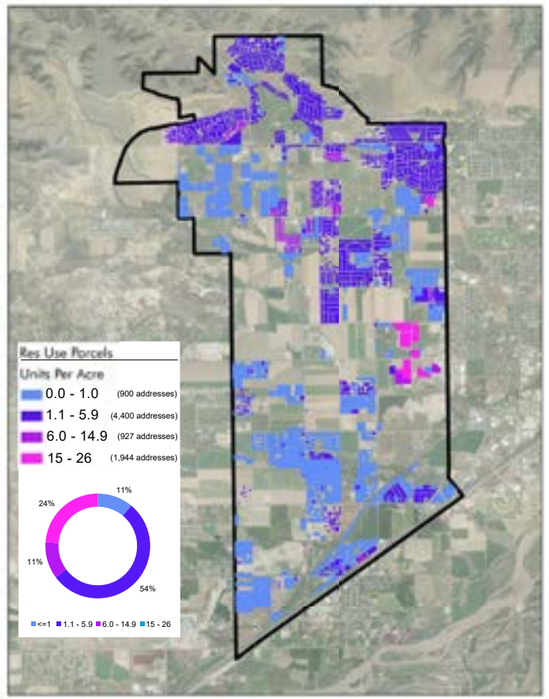
(c) geographic distribution of future land uses in the jurisdiction, anticipated over a 20-year planning period that specifically demonstrate:

i) adequate land to support the projected population in all land use types in areas where local services can be adequately and cost-effectively provided for that population;

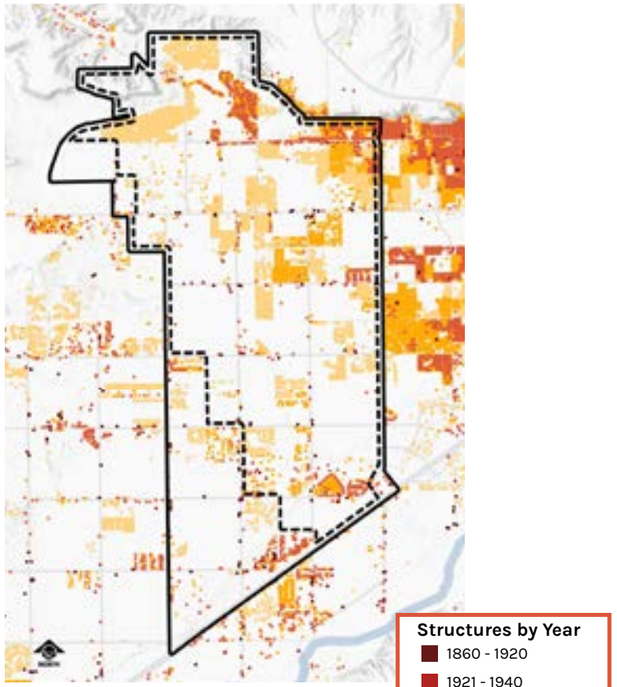
Historically, public investment in utility and transportation facilities combined with ample supply of developable land has driven rapid population growth in West Billings as compared to other areas of Yellowstone County. From 2000 to 2020, a total of 4,490 housing units were constructed in the plan area. This accounts for approximately 30 percent of all housing units constructed within Yellowstone County during that period. Population projections for this plan assume that the West Billings plan area will continue to receive a similar share of county population growth over the next 20 years.

Consistent with the Montana Land Use Planning Act, population projections were estimated over the next 20 years (2045) based on data resources including the Billings Long Range Transportation Plan (LRTP), the US Census, and the Montana Department of Commerce Regional Economic Models Inc (REMI). For consistency among planning documents, data from the LRTP was used to create projections within the West Billings plan area. Figure B.4 provides the growth projections for plan area.

Commercial Land Use Demand



B.5 Housing Inventory by Density



B.6 Housing Inventory by Year Built

Projection

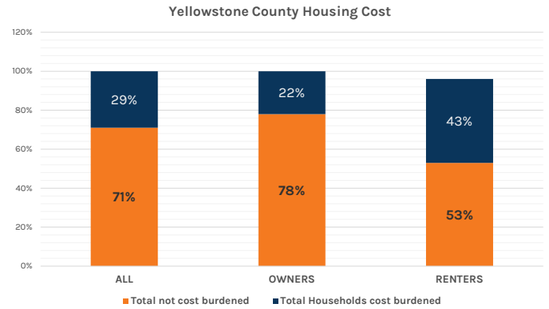
In order to meet the project themes informed by the project's public input, the project team included varying scales of commercial zones in several future land use categories. Categories that allow commercial zones include; Urban Residential (UR), Urban Residential Mixed (URM), Urban Node (UN), Commercial Mixed (CM), and Employment and Industrial (EI).

Yellowstone County GIS data indicates that 905 acres within the plan area are under commercial use. Applying a compound annual growth rate similar to the plan area's projected 3.1% population growth yields a projected demand of 1,660 acres. The FLUM provides 4,076 acres of future land use categories that allow commercial use. It is unlikely that those categories will develop as 100% commercial land uses, but the market for commercial land use has adequate room to expand within the plan area over the next twenty years.

Residential Land Use Demand Projection

Section 76-25-213(4)(c) requires that the FLUM identify the following:

(ii) adequate sites to accommodate the type and supply of housing needed for the projected population; and



B.7 Yellowstone County Housing Burden

B.8 Median Sales Price by Housing Type

After performing an analysis of existing housing stock including factors like year built and residential density (Figures B.5 and B.6) the project team cross referenced the plan area's population growth projections, average houshold size, and percent of Yellowstone County residents who experience housing burden to determine the 20-year projected housing demand and percent of that projected demand which will need to be affordable to Billings area residents.

Because 29% of Yellowstone County residents experience housing burden (Figure B.7 Yellowstone County Housing Burden), the project team determined that, to meet the above MLUPA requirement, 29% of the projected housing demand should be met by providing land in the FLUM categorized to provide "missing middle" housing, which tends to be more affordable than lower-density, single-family housing or higher-density apartment buildings (Figure B.8). Future land use categories considered most likely to provide missing middle housing include Urban Residential (UR) and Urban Residential Mixed (URM).

To determine the area required to meet projected residential land use demand, the project team analyzed existing development in the plan area according to their zoning and the resulting residential density. (Figure B.5)

Section 76-25-213(4)(c) requires that the FLUM identify the following:

(iii) areas of the jurisdiction that are not generally suitable for development and the reason, based on the constraints identified through the land use plan analysis;

As stated in the suitability mapping process section of this appendix, the project team designated all floodplains in the plan area as undevelopable for purposes of MLUPA compliance. Where a zoned, developed property intersects a floodplain, a category containing the present zoning was applied.

APPENDIX C
TRAFFIC COUNT DATA

Appendix C Contents

Traffic Count Data 216

Traffic Count Data

Average Daily Traffic:

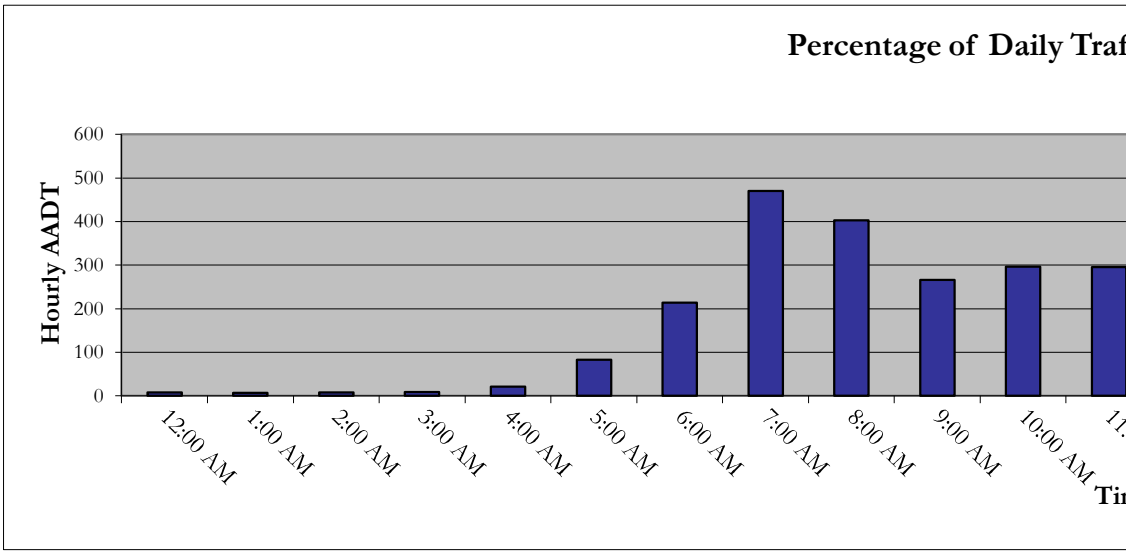
VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	2/8/2024	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	2/4/2024 Sunday		2/5/2024 Monday		2/6/2024 Tuesday		2/7/2024 Wednesday		2/8/2024 Thursday	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
0:00									4	4
1:00									7	0
2:00									2	6
3:00									2	7
4:00									0	21
5:00									10	73
6:00									43	171
7:00									64	406
8:00									140	263
9:00									100	166
10:00									157	140
11:00									129	167
12:00									175	146
13:00									164	137
14:00									190	167
15:00									279	186
16:00									271	203
17:00									330	177
18:00									214	152
19:00									166	56
20:00									121	42
21:00									82	22
22:00									30	14
23:00									11	5
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2,691**	**2,731**

Percentage of Daily Traf



NT SUMMARY

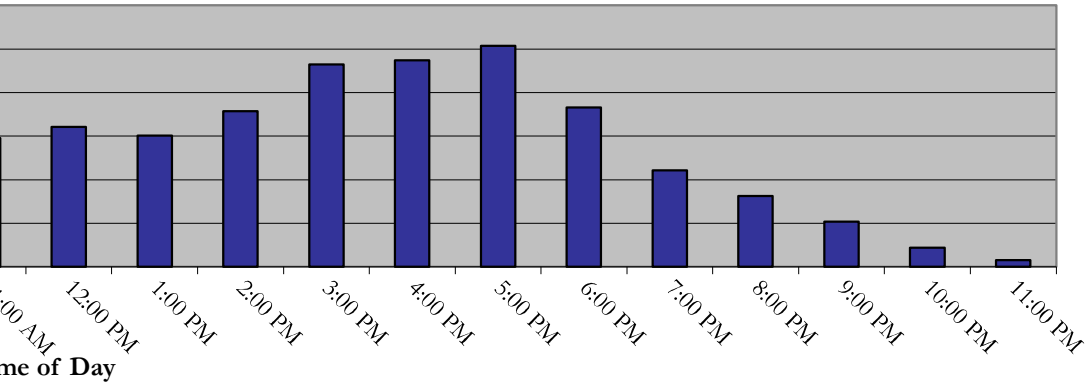
ocation: Rimrock Rd & 62ND ST West (North Leg) - North Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.010

	2/9/2024 Friday		2/10/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	NB	SB	NB	SB	NB	SB	ADT	NB	SB	ADT
					4	4	8	0.1%	0.1%	0.1%
					7	0	7	0.3%	0.0%	0.1%
					2	6	8	0.1%	0.2%	0.1%
					2	7	9	0.1%	0.3%	0.2%
					0	21	21	0.0%	0.8%	0.4%
					10	73	83	0.4%	2.7%	1.5%
					43	171	214	1.6%	6.3%	3.9%
					64	406	470	2.4%	14.9%	8.7%
					140	263	403	5.2%	9.6%	7.4%
					100	166	266	3.7%	6.1%	4.9%
					157	140	297	5.8%	5.1%	5.5%
					129	167	296	4.8%	6.1%	5.5%
					175	146	321	6.5%	5.3%	5.9%
					164	137	301	6.1%	5.0%	5.6%
					190	167	357	7.1%	6.1%	6.6%
					279	186	465	10.4%	6.8%	8.6%
					271	203	474	10.1%	7.4%	8.7%
					330	177	507	12.3%	6.5%	9.4%
					214	152	366	8.0%	5.6%	6.8%
					166	56	222	6.2%	2.1%	4.1%
					121	42	163	4.5%	1.5%	3.0%
					82	22	104	3.0%	0.8%	1.9%
					30	14	44	1.1%	0.5%	0.8%
					11	5	16	0.4%	0.2%	0.3%
	0	**0**	**0**	**0**	**2,691**	**2,731**	**5,422**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour

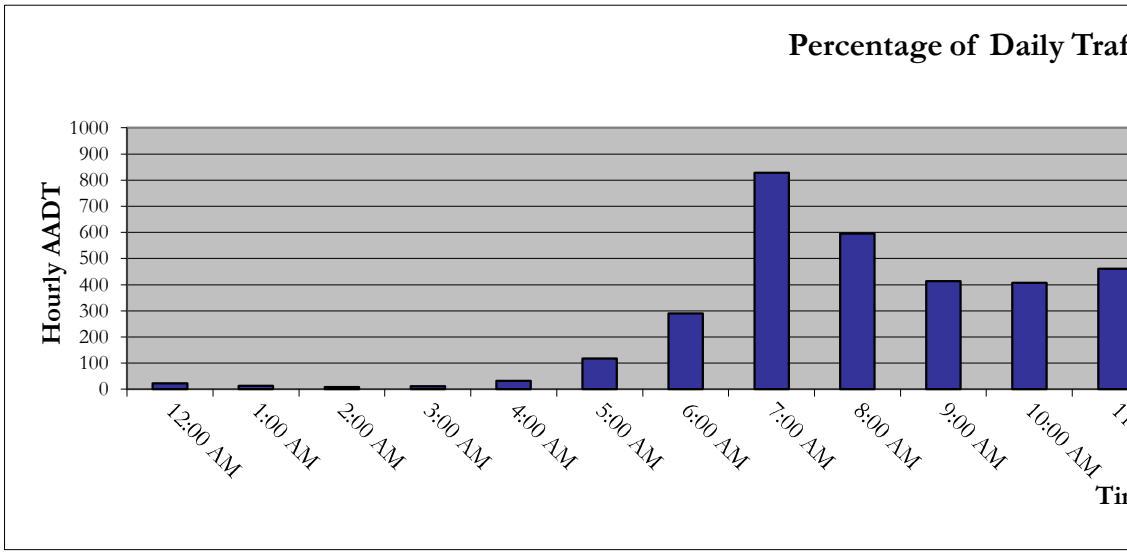


VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	5/16/2023	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	5/14/2023 Sunday		5/15/2023 Monday		5/16/2023 Tuesday		5/17/2023 Wednesday		5/18/2023 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00					8	15				
1:00					4	10				
2:00					5	4				
3:00					8	4				
4:00					18	14				
5:00					74	43				
6:00					170	120				
7:00					512	317				
8:00					341	255				
9:00					234	179				
10:00					210	197				
11:00					245	216				
12:00					258	249				
13:00					237	239				
14:00					254	304				
15:00					422	423				
16:00					434	507				
17:00					477	434				
18:00					318	314				
19:00					151	223				
20:00					106	196				
21:00					61	91				
22:00					34	77				
23:00					14	22				
TOTAL	0	0	0	0	4,595	4,453	0	0	0	0



NT SUMMARY

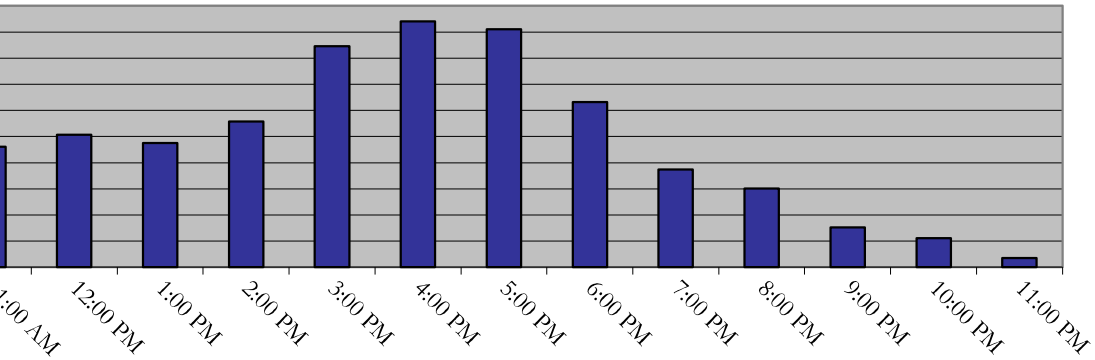
ocation: Grand Avenue & 56TH ST West - East Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 0.970

	5/19/2023 Friday		5/20/2023 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					8	15	23	0.2%	0.3%	0.3%
					4	10	14	0.1%	0.2%	0.2%
					5	4	9	0.1%	0.1%	0.1%
					8	4	12	0.2%	0.1%	0.1%
					18	14	32	0.4%	0.3%	0.4%
					74	43	117	1.6%	1.0%	1.3%
					170	120	290	3.7%	2.7%	3.2%
					512	317	829	11.1%	7.1%	9.2%
					341	255	596	7.4%	5.7%	6.6%
					234	179	413	5.1%	4.0%	4.6%
					210	197	407	4.6%	4.4%	4.5%
					245	216	461	5.3%	4.9%	5.1%
					258	249	507	5.6%	5.6%	5.6%
					237	239	476	5.2%	5.4%	5.3%
					254	304	558	5.5%	6.8%	6.2%
					422	423	845	9.2%	9.5%	9.3%
					434	507	941	9.4%	11.4%	10.4%
					477	434	911	10.4%	9.7%	10.1%
					318	314	632	6.9%	7.1%	7.0%
					151	223	374	3.3%	5.0%	4.1%
					106	196	302	2.3%	4.4%	3.3%
					61	91	152	1.3%	2.0%	1.7%
					34	77	111	0.7%	1.7%	1.2%
					14	22	36	0.3%	0.5%	0.4%
	0	**0**	**0**	**0**	**4,595**	**4,453**	**9,048**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



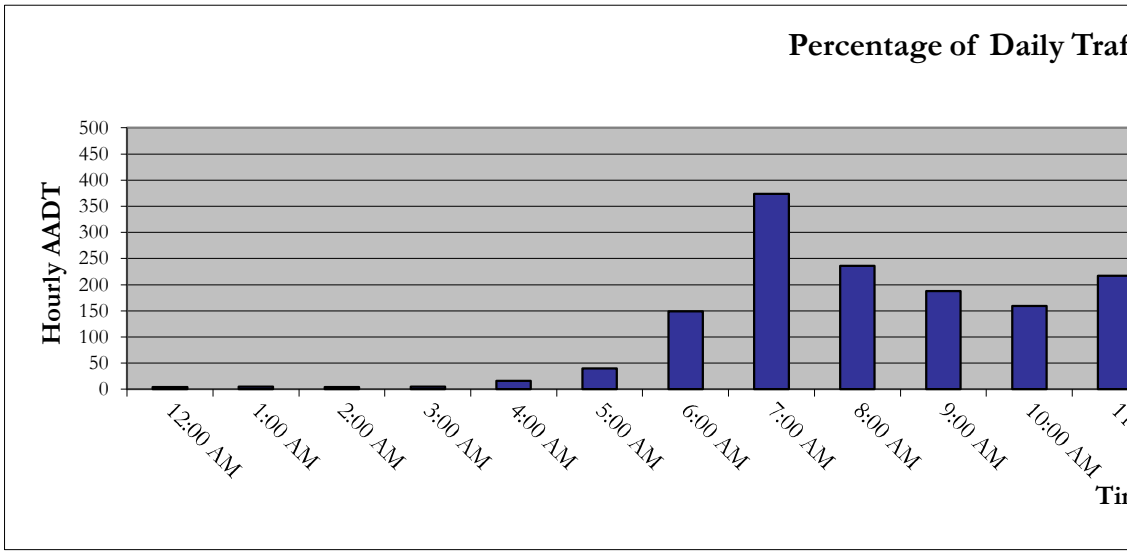
me of Day

VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	1/9/2024	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	1/9/2024 Sunday		1/10/2024 Monday		1/11/2024 Tuesday		1/12/2024 Wednesday		1/13/2024 Thursday	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
0:00					1	3				
1:00					4	1				
2:00					2	2				
3:00					4	1				
4:00					10	6				
5:00					22	18				
6:00					74	75				
7:00					165	209				
8:00					126	110				
9:00					88	100				
10:00					86	73				
11:00					115	102				
12:00					98	95				
13:00					106	93				
14:00					144	138				
15:00					250	179				
16:00					189	194				
17:00					214	176				
18:00					133	101				
19:00					96	77				
20:00					77	43				
21:00					30	17				
22:00					11	16				
23:00					6	9				
TOTAL	**0**	**0**	**0**	**0**	**2,051**	**1,838**	**0**	**0**	**0**	**0**



NT SUMMARY

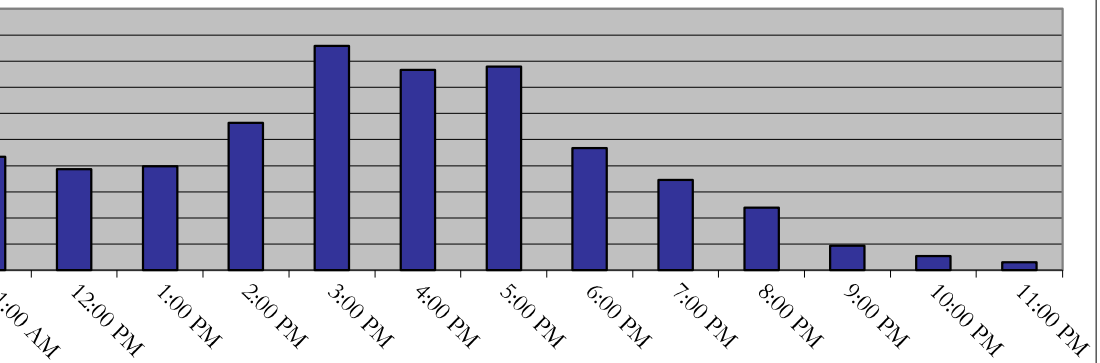
ocation: Rimrock Rd & 54TH ST West - South Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.040

	1/14/2024 Friday		1/15/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	NB	SB	NB	SB	NB	SB	ADT	NB	SB	ADT
					1	3	4	0.0%	0.2%	0.1%
					4	1	5	0.2%	0.1%	0.1%
					2	2	4	0.1%	0.1%	0.1%
					4	1	5	0.2%	0.1%	0.1%
					10	6	16	0.5%	0.3%	0.4%
					22	18	40	1.1%	1.0%	1.0%
					74	75	149	3.6%	4.1%	3.8%
					165	209	374	8.0%	11.4%	9.6%
					126	110	236	6.1%	6.0%	6.1%
					88	100	188	4.3%	5.4%	4.8%
					86	73	159	4.2%	4.0%	4.1%
					115	102	217	5.6%	5.5%	5.6%
					98	95	193	4.8%	5.2%	5.0%
					106	93	199	5.2%	5.1%	5.1%
					144	138	282	7.0%	7.5%	7.3%
					250	179	429	12.2%	9.7%	11.0%
					189	194	383	9.2%	10.6%	9.8%
					214	176	390	10.4%	9.6%	10.0%
					133	101	234	6.5%	5.5%	6.0%
					96	77	173	4.7%	4.2%	4.4%
					77	43	120	3.8%	2.3%	3.1%
					30	17	47	1.5%	0.9%	1.2%
					11	16	27	0.5%	0.9%	0.7%
					6	9	15	0.3%	0.5%	0.4%
	0	**0**	**0**	**0**	**2,051**	**1,838**	**3,889**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



me of Day

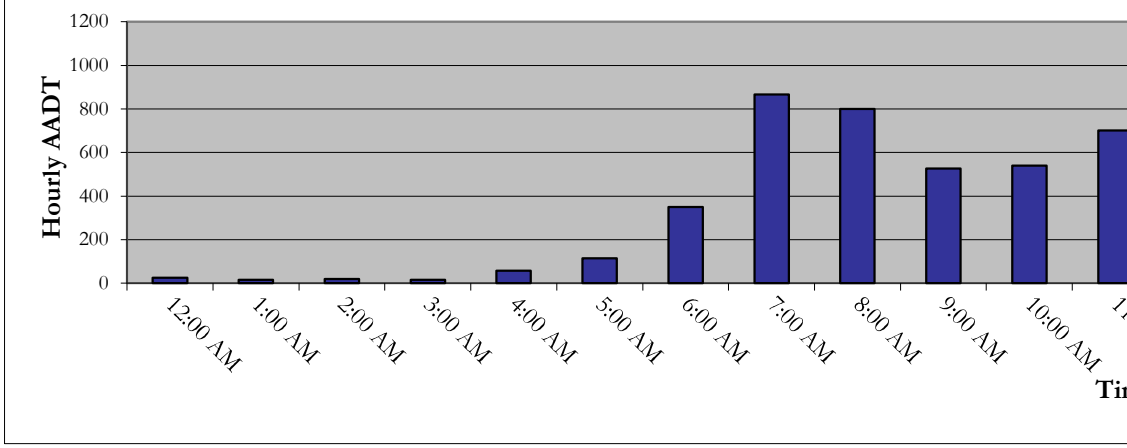
VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	1/9/2024	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	1/7/2024 Sunday		1/8/2024 Monday		1/9/2024 Tuesday		1/10/2024 Wednesday		1/11/2024 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00					8	18				
1:00					7	9				
2:00					8	11				
3:00					10	6				
4:00					41	17				
5:00					83	32				
6:00					256	94				
7:00					633	234				
8:00					436	365				
9:00					307	220				
10:00					281	260				
11:00					340	361				
12:00					330	371				
13:00					283	327				
14:00					357	406				
15:00					400	566				
16:00					350	558				
17:00					361	672				
18:00					266	365				
19:00					157	308				
20:00					96	208				
21:00					43	77				
22:00					41	44				
23:00					15	22				
TOTAL	**0**	**0**	**0**	**0**	**5,109**	**5,551**	**0**	**0**	**0**	**0**

Percentage of Daily Traf



NT SUMMARY

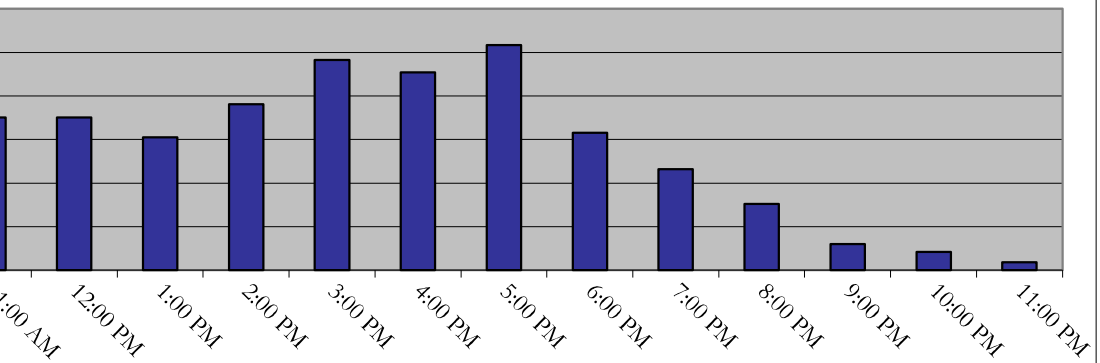
ocation: Grand Avenue & 48TH ST West - East Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.040

	1/12/2024 Friday		1/13/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					8	18	26	0.2%	0.3%	0.2%
					7	9	16	0.1%	0.2%	0.2%
					8	11	19	0.2%	0.2%	0.2%
					10	6	16	0.2%	0.1%	0.2%
					41	17	58	0.8%	0.3%	0.5%
					83	32	115	1.6%	0.6%	1.1%
					256	94	350	5.0%	1.7%	3.3%
					633	234	867	12.4%	4.2%	8.1%
					436	365	801	8.5%	6.6%	7.5%
					307	220	527	6.0%	4.0%	4.9%
					281	260	541	5.5%	4.7%	5.1%
					340	361	701	6.7%	6.5%	6.6%
					330	371	701	6.5%	6.7%	6.6%
					283	327	610	5.5%	5.9%	5.7%
					357	406	763	7.0%	7.3%	7.2%
					400	566	966	7.8%	10.2%	9.1%
					350	558	908	6.9%	10.1%	8.5%
					361	672	1033	7.1%	12.1%	9.7%
					266	365	631	5.2%	6.6%	5.9%
					157	308	465	3.1%	5.5%	4.4%
					96	208	304	1.9%	3.7%	2.9%
					43	77	120	0.8%	1.4%	1.1%
					41	44	85	0.8%	0.8%	0.8%
					15	22	37	0.3%	0.4%	0.3%
	0	**0**	**0**	**0**	**5,109**	**5,551**	**10,660**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



me of Day

VOLUME COUN

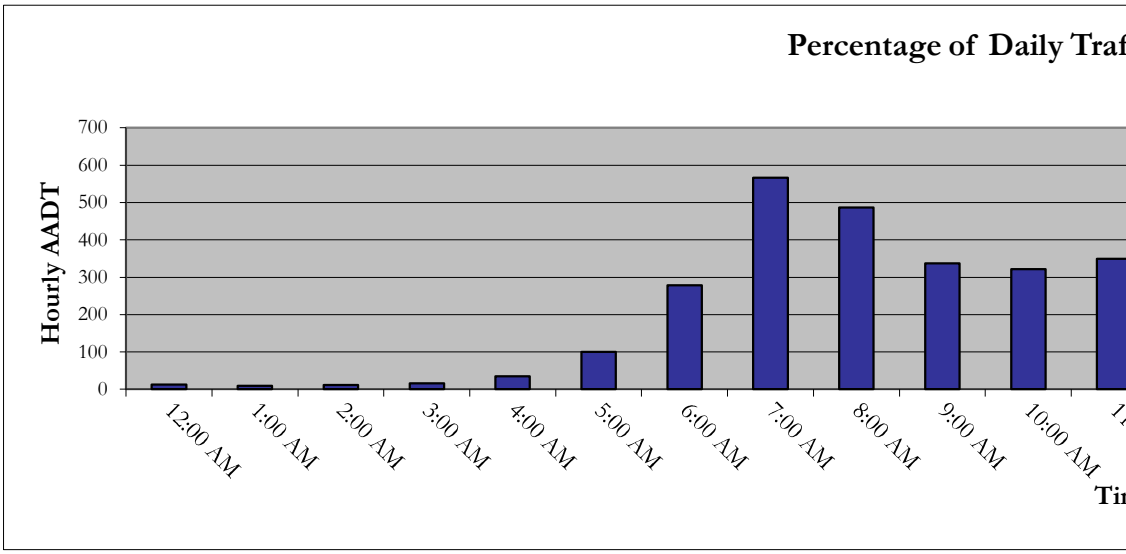
General Information

Counted By:	Rafael Teixeira
Agency/Company:	Sanderson Stewart
Dates Performed:	2/8/2024
Project Number:	23379
Project Description:	West Billings Neighborhood Plan

Count L
Jurisdicti
Street Cl
Seasonal

Hour Begin	2/4/2024 Sunday		2/5/2024 Monday		2/6/2024 Tuesday		2/7/2024 Wednesday		2/8/2024 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00									6	7
1:00									2	7
2:00									6	5
3:00									11	5
4:00									30	5
5:00									87	13
6:00									215	63
7:00									469	98
8:00									304	183
9:00									206	131
10:00									165	157
11:00									185	164
12:00									186	190
13:00									166	206
14:00									199	231
15:00									227	340
16:00									240	339
17:00									204	364
18:00									170	236
19:00									73	174
20:00									56	168
21:00									34	107
22:00									19	36
23:00									10	19
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,270**	**3,248**

Percentage of Daily Traf



NT SUMMARY

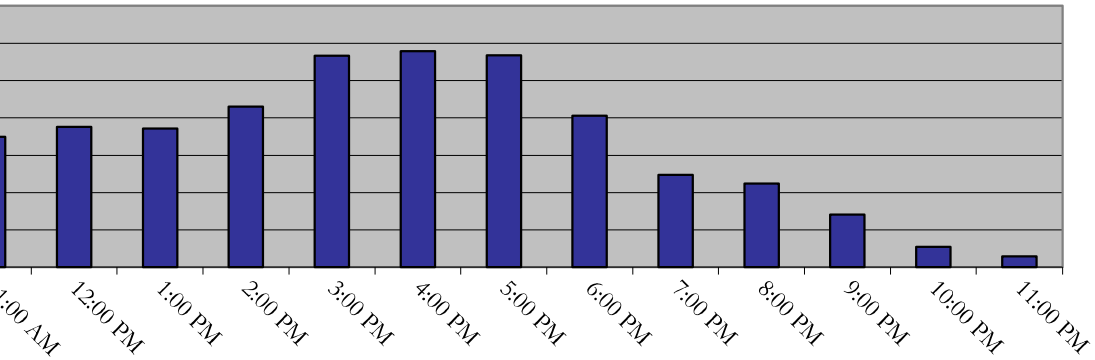
ocation: Rimrock Rd & 62ND ST West (East Leg) - East Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.010

	2/9/2024 Friday		2/10/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					6	7	13	0.2%	0.2%	0.2%
					2	7	9	0.1%	0.2%	0.1%
					6	5	11	0.2%	0.2%	0.2%
					11	5	16	0.3%	0.2%	0.2%
					30	5	35	0.9%	0.2%	0.5%
					87	13	100	2.7%	0.4%	1.5%
					215	63	278	6.6%	1.9%	4.3%
					469	98	567	14.3%	3.0%	8.7%
					304	183	487	9.3%	5.6%	7.5%
					206	131	337	6.3%	4.0%	5.2%
					165	157	322	5.0%	4.8%	4.9%
					185	164	349	5.7%	5.0%	5.4%
					186	190	376	5.7%	5.8%	5.8%
					166	206	372	5.1%	6.3%	5.7%
					199	231	430	6.1%	7.1%	6.6%
					227	340	567	6.9%	10.5%	8.7%
					240	339	579	7.3%	10.4%	8.9%
					204	364	568	6.2%	11.2%	8.7%
					170	236	406	5.2%	7.3%	6.2%
					73	174	247	2.2%	5.4%	3.8%
					56	168	224	1.7%	5.2%	3.4%
					34	107	141	1.0%	3.3%	2.2%
					19	36	55	0.6%	1.1%	0.8%
					10	19	29	0.3%	0.6%	0.4%
3	**0**	**0**	**0**	**0**	**3,270**	**3,248**	**6,518**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



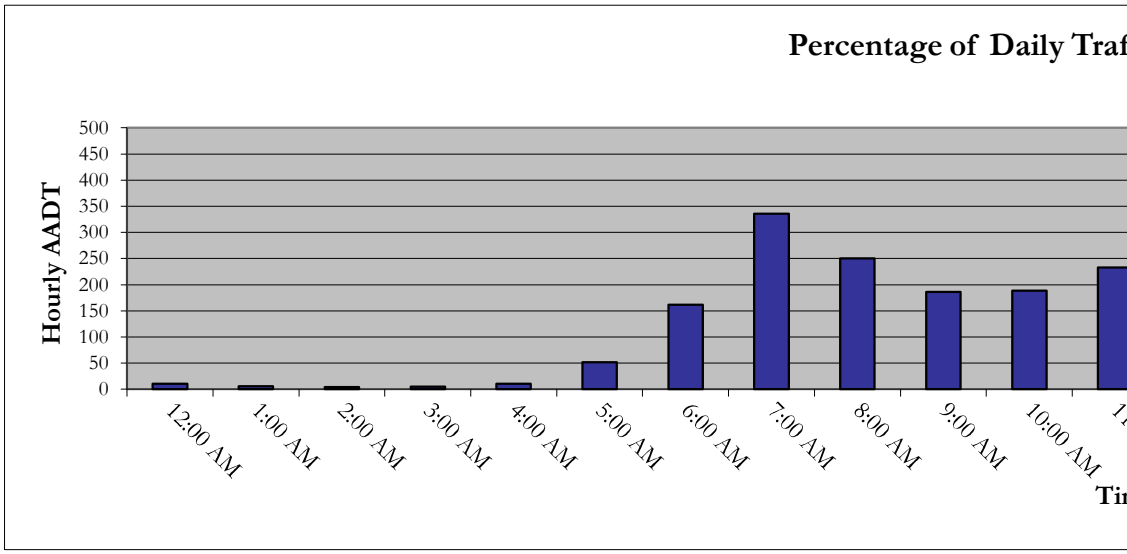
me of Day

VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	9/12/2023	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	9/10/2023 Sunday		9/11/2023 Monday		9/12/2023 Tuesday		9/13/2023 Wednesday		9/14/2023 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00					5	6				
1:00					4	2				
2:00					2	2				
3:00					4	1				
4:00					8	3				
5:00					38	14				
6:00					119	43				
7:00					240	96				
8:00					171	79				
9:00					98	88				
10:00					93	96				
11:00					117	116				
12:00					119	130				
13:00					95	111				
14:00					94	137				
15:00					128	226				
16:00					156	254				
17:00					145	287				
18:00					136	123				
19:00					88	99				
20:00					21	77				
21:00					8	31				
22:00					11	19				
23:00					9	15				
TOTAL	**0**	**0**	**0**	**0**	**1,909**	**2,055**	**0**	**0**	**0**	**0**



NT SUMMARY

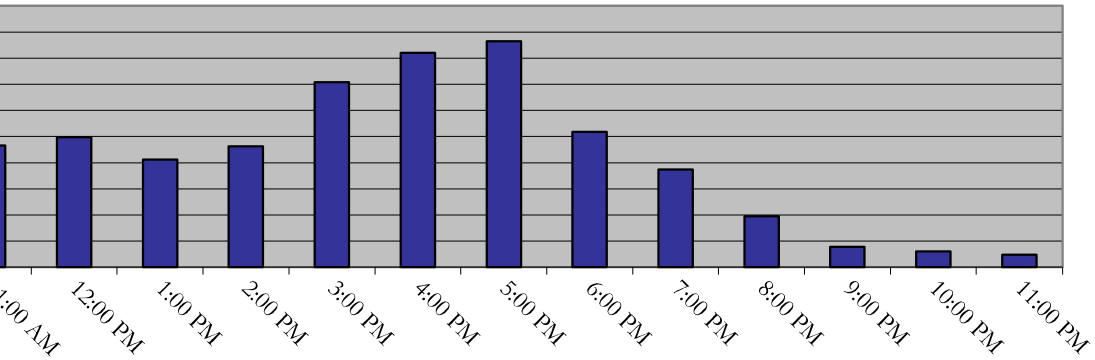
ocation: Hesper Rd & 48TH ST West - West Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 0.950

	9/15/2023 Friday		9/16/2023 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					5	6	11	0.3%	0.3%	0.3%
					4	2	6	0.2%	0.1%	0.2%
					2	2	4	0.1%	0.1%	0.1%
					4	1	5	0.2%	0.0%	0.1%
					8	3	11	0.4%	0.1%	0.3%
					38	14	52	2.0%	0.7%	1.3%
					119	43	162	6.2%	2.1%	4.1%
					240	96	336	12.6%	4.7%	8.5%
					171	79	250	9.0%	3.8%	6.3%
					98	88	186	5.1%	4.3%	4.7%
					93	96	189	4.9%	4.7%	4.8%
					117	116	233	6.1%	5.6%	5.9%
					119	130	249	6.2%	6.3%	6.3%
					95	111	206	5.0%	5.4%	5.2%
					94	137	231	4.9%	6.7%	5.8%
					128	226	354	6.7%	11.0%	8.9%
					156	254	410	8.2%	12.4%	10.3%
					145	287	432	7.6%	14.0%	10.9%
					136	123	259	7.1%	6.0%	6.5%
					88	99	187	4.6%	4.8%	4.7%
					21	77	98	1.1%	3.7%	2.5%
					8	31	39	0.4%	1.5%	1.0%
					11	19	30	0.6%	0.9%	0.8%
					9	15	24	0.5%	0.7%	0.6%
	0	**0**	**0**	**0**	**1,909**	**2,055**	**3,964**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



me of Day

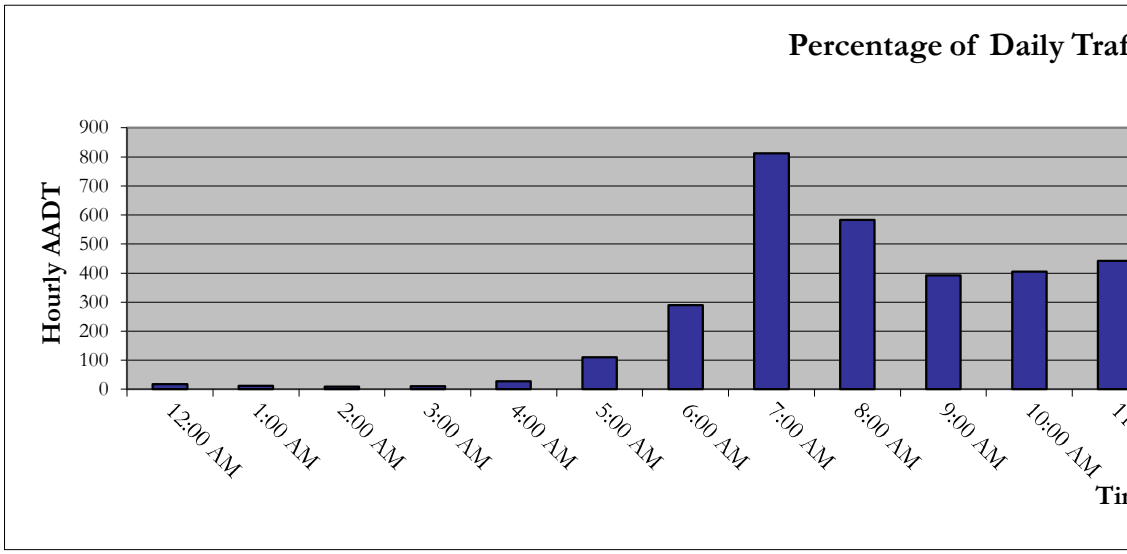
VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	5/16/2023	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	5/14/2023 Sunday		5/15/2023 Monday		5/16/2023 Tuesday		5/17/2023 Wednesday		5/18/2023 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00					8	10				
1:00					3	9				
2:00					5	4				
3:00					8	3				
4:00					19	9				
5:00					74	36				
6:00					201	89				
7:00					554	258				
8:00					347	236				
9:00					229	163				
10:00					218	187				
11:00					239	203				
12:00					241	259				
13:00					214	235				
14:00					243	281				
15:00					372	371				
16:00					371	391				
17:00					362	434				
18:00					223	324				
19:00					146	228				
20:00					87	196				
21:00					55	101				
22:00					30	73				
23:00					12	22				
TOTAL	**0**	**0**	**0**	**0**	**4,261**	**4,122**	**0**	**0**	**0**	**0**

Percentage of Daily Traf



NT SUMMARY

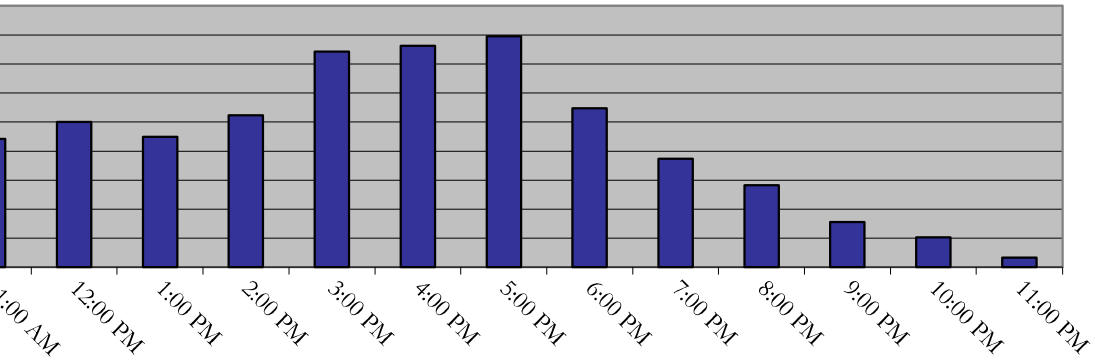
ocation: Grand Avenue & 56TH ST West - West Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 0.970

	5/19/2023 Friday		5/20/2023 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					8	10	18	0.2%	0.2%	0.2%
					3	9	12	0.1%	0.2%	0.1%
					5	4	9	0.1%	0.1%	0.1%
					8	3	11	0.2%	0.1%	0.1%
					19	9	28	0.4%	0.2%	0.3%
					74	36	110	1.7%	0.9%	1.3%
					201	89	290	4.7%	2.2%	3.5%
					554	258	812	13.0%	6.3%	9.7%
					347	236	583	8.1%	5.7%	7.0%
					229	163	392	5.4%	4.0%	4.7%
					218	187	405	5.1%	4.5%	4.8%
					239	203	442	5.6%	4.9%	5.3%
					241	259	500	5.7%	6.3%	6.0%
					214	235	449	5.0%	5.7%	5.4%
					243	281	524	5.7%	6.8%	6.3%
					372	371	743	8.7%	9.0%	8.9%
					371	391	762	8.7%	9.5%	9.1%
					362	434	796	8.5%	10.5%	9.5%
					223	324	547	5.2%	7.9%	6.5%
					146	228	374	3.4%	5.5%	4.5%
					87	196	283	2.0%	4.8%	3.4%
					55	101	156	1.3%	2.5%	1.9%
					30	73	103	0.7%	1.8%	1.2%
					12	22	34	0.3%	0.5%	0.4%
	0	**0**	**0**	**0**	**4,261**	**4,122**	**8,383**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



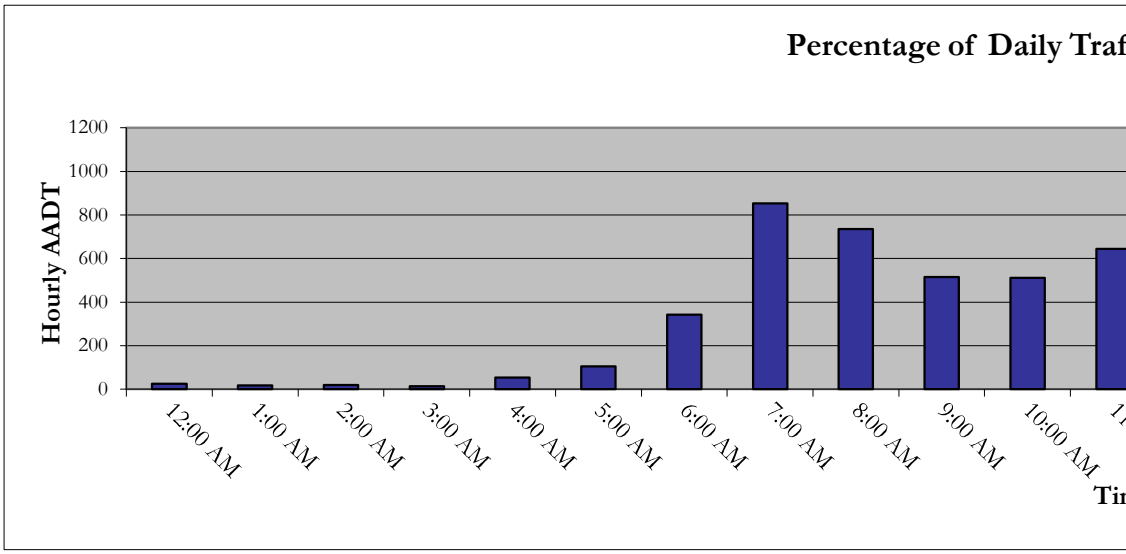
me of Day

VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count Lo
Agency/Company:	Sanderson Stewart	
Dates Performed:	1/9/2024	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	1/7/2024 Sunday		1/8/2024 Monday		1/9/2024 Tuesday		1/10/2024 Wednesday		1/11/2024 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00					9	16				
1:00					9	9				
2:00					8	11				
3:00					9	5				
4:00					37	17				
5:00					75	30				
6:00					251	92				
7:00					635	219				
8:00					478	257				
9:00					281	234				
10:00					272	240				
11:00					316	329				
12:00					332	368				
13:00					289	319				
14:00					366	373				
15:00					391	525				
16:00					332	538				
17:00					371	657				
18:00					249	360				
19:00					171	292				
20:00					92	199				
21:00					43	79				
22:00					38	40				
23:00					12	26				
TOTAL	**0**	**0**	**0**	**0**	**5,066**	**5,235**	**0**	**0**	**0**	**0**



NT SUMMARY

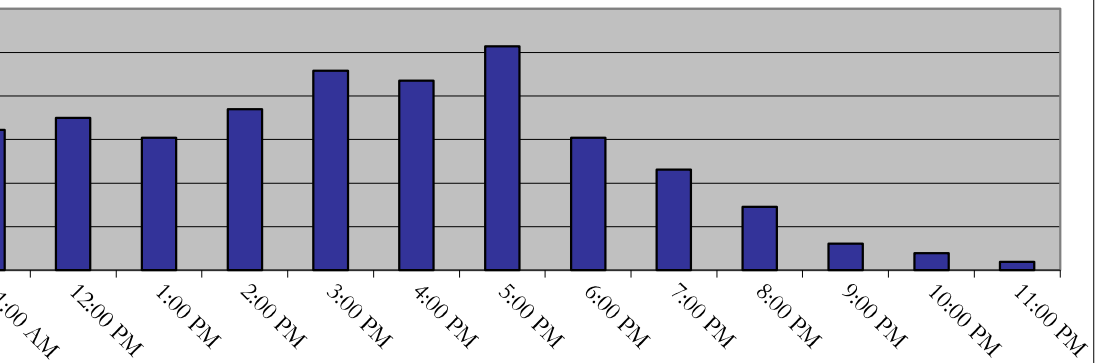
ocation: Grand Avenue & 48TH ST West - West Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.040

	1/12/2024 Friday		1/13/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					9	16	25	0.2%	0.3%	0.2%
					9	9	18	0.2%	0.2%	0.2%
					8	11	19	0.2%	0.2%	0.2%
					9	5	14	0.2%	0.1%	0.1%
					37	17	54	0.7%	0.3%	0.5%
					75	30	105	1.5%	0.6%	1.0%
					251	92	343	5.0%	1.8%	3.3%
					635	219	854	12.5%	4.2%	8.3%
					478	257	735	9.4%	4.9%	7.1%
					281	234	515	5.5%	4.5%	5.0%
					272	240	512	5.4%	4.6%	5.0%
					316	329	645	6.2%	6.3%	6.3%
					332	368	700	6.6%	7.0%	6.8%
					289	319	608	5.7%	6.1%	5.9%
					366	373	739	7.2%	7.1%	7.2%
					391	525	916	7.7%	10.0%	8.9%
					332	538	870	6.6%	10.3%	8.4%
					371	657	1028	7.3%	12.6%	10.0%
					249	360	609	4.9%	6.9%	5.9%
					171	292	463	3.4%	5.6%	4.5%
					92	199	291	1.8%	3.8%	2.8%
					43	79	122	0.8%	1.5%	1.2%
					38	40	78	0.8%	0.8%	0.8%
					12	26	38	0.2%	0.5%	0.4%
	0	**0**	**0**	**0**	**5,066**	**5,235**	**10,301**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



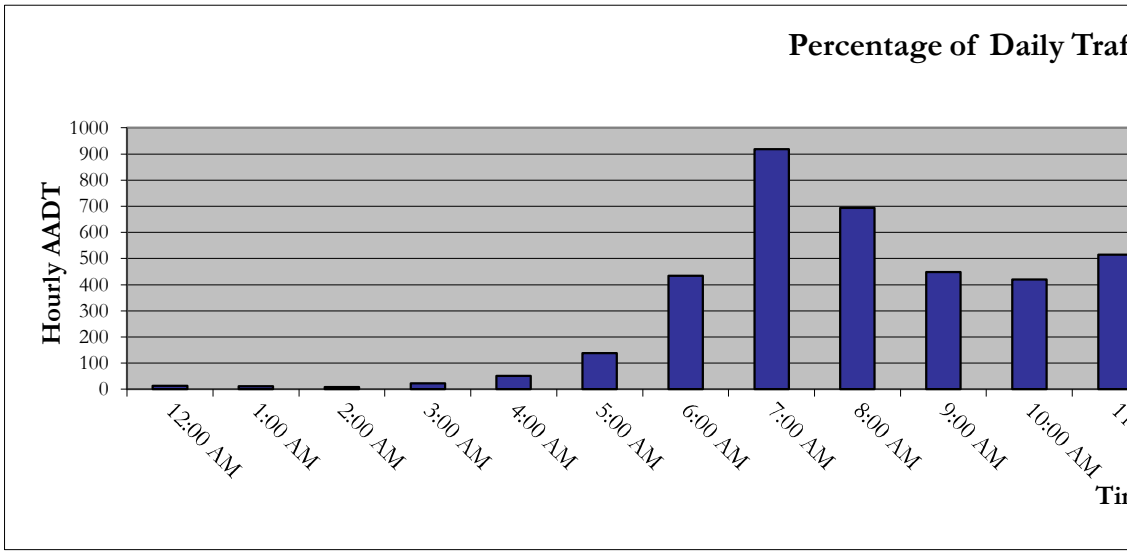
me of Day

VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	1/9/2024	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	1/9/2024 Sunday		1/10/2024 Monday		1/11/2024 Tuesday		1/12/2024 Wednesday		1/13/2024 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00					3	11				
1:00					7	5				
2:00					4	4				
3:00					18	5				
4:00					45	7				
5:00					109	29				
6:00					337	97				
7:00					714	204				
8:00					438	256				
9:00					246	202				
10:00					239	181				
11:00					272	243				
12:00					268	256				
13:00					257	249				
14:00					306	296				
15:00					343	445				
16:00					350	523				
17:00					345	546				
18:00					196	303				
19:00					109	259				
20:00					69	197				
21:00					43	107				
22:00					18	62				
23:00					12	30				
TOTAL	**0**	**0**	**0**	**0**	**4,748**	**4,517**	**0**	**0**	**0**	**0**



NT SUMMARY

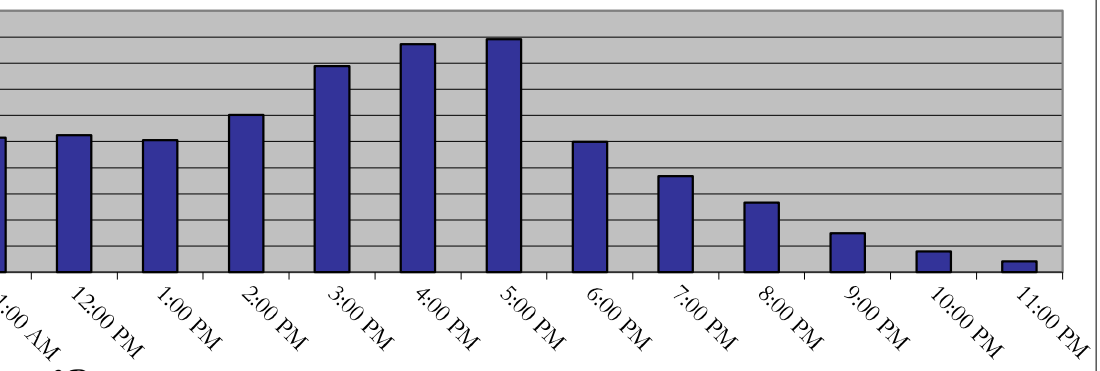
ocation: Rimrock Rd & 54TH ST West - East Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.040

	1/14/2024 Friday		1/15/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					3	11	14	0.1%	0.2%	0.2%
					7	5	12	0.1%	0.1%	0.1%
					4	4	8	0.1%	0.1%	0.1%
					18	5	23	0.4%	0.1%	0.2%
					45	7	52	0.9%	0.2%	0.6%
					109	29	138	2.3%	0.6%	1.5%
					337	97	434	7.1%	2.1%	4.7%
					714	204	918	15.0%	4.5%	9.9%
					438	256	694	9.2%	5.7%	7.5%
					246	202	448	5.2%	4.5%	4.8%
					239	181	420	5.0%	4.0%	4.5%
					272	243	515	5.7%	5.4%	5.6%
					268	256	524	5.6%	5.7%	5.7%
					257	249	506	5.4%	5.5%	5.5%
					306	296	602	6.4%	6.6%	6.5%
					343	445	788	7.2%	9.9%	8.5%
					350	523	873	7.4%	11.6%	9.4%
					345	546	891	7.3%	12.1%	9.6%
					196	303	499	4.1%	6.7%	5.4%
					109	259	368	2.3%	5.7%	4.0%
					69	197	266	1.5%	4.4%	2.9%
					43	107	150	0.9%	2.4%	1.6%
					18	62	80	0.4%	1.4%	0.9%
					12	30	42	0.3%	0.7%	0.5%
	0	**0**	**0**	**0**	**4,748**	**4,517**	**9,265**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



me of Day

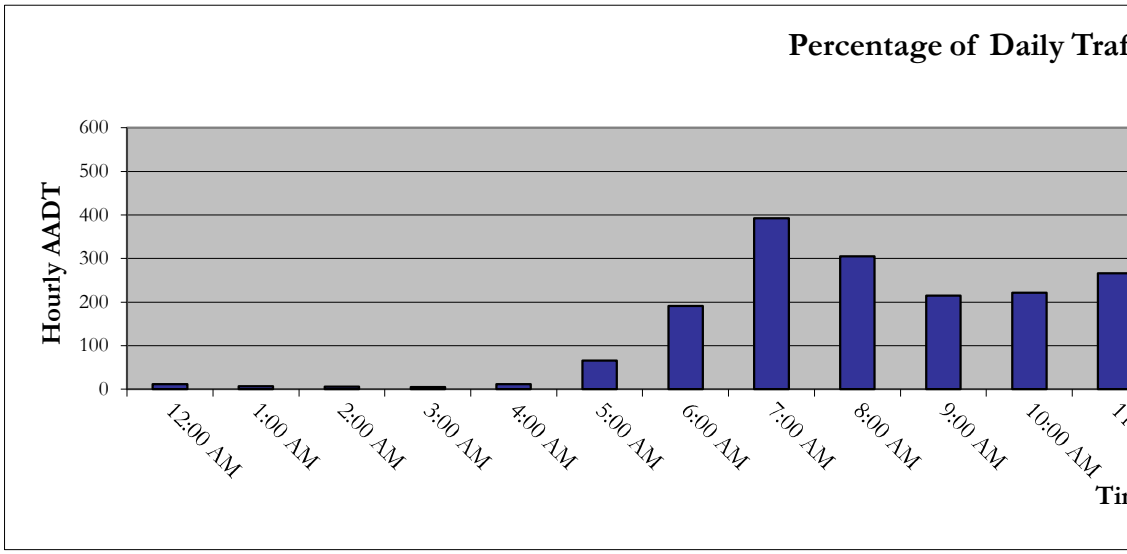
VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	9/12/2023	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	9/10/2023 Sunday		9/11/2023 Monday		9/12/2023 Tuesday		9/13/2023 Wednesday		9/14/2023 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00					5	7				
1:00					5	2				
2:00					4	2				
3:00					4	1				
4:00					8	4				
5:00					51	15				
6:00					144	47				
7:00					291	102				
8:00					209	96				
9:00					111	104				
10:00					107	115				
11:00					122	144				
12:00					144	164				
13:00					123	141				
14:00					118	157				
15:00					150	257				
16:00					193	285				
17:00					176	333				
18:00					147	140				
19:00					91	119				
20:00					22	95				
21:00					10	41				
22:00					10	25				
23:00					8	16				
TOTAL	**0**	**0**	**0**	**0**	**2,253**	**2,412**	**0**	**0**	**0**	**0**

Percentage of Daily Traf



NT SUMMARY

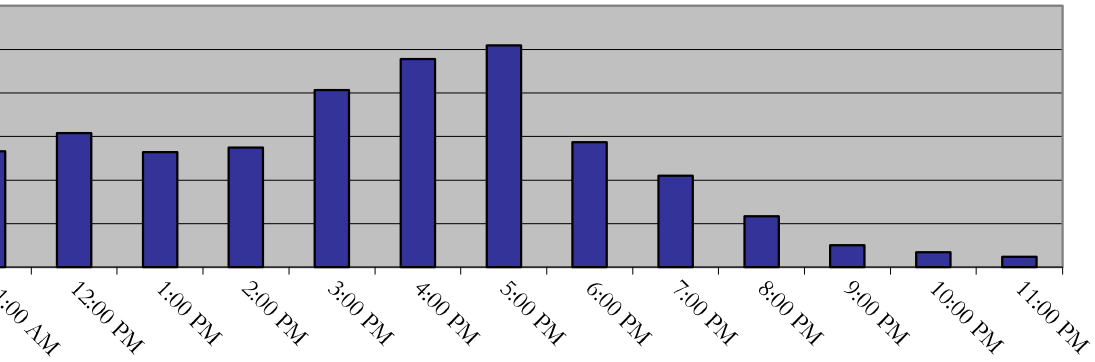
ocation: Hesper Rd & 48TH ST West - East Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 0.950

	9/15/2023 Friday		9/16/2023 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					5	7	12	0.2%	0.3%	0.3%
					5	2	7	0.2%	0.1%	0.2%
					4	2	6	0.2%	0.1%	0.1%
					4	1	5	0.2%	0.0%	0.1%
					8	4	12	0.4%	0.2%	0.3%
					51	15	66	2.3%	0.6%	1.4%
					144	47	191	6.4%	1.9%	4.1%
					291	102	393	12.9%	4.2%	8.4%
					209	96	305	9.3%	4.0%	6.5%
					111	104	215	4.9%	4.3%	4.6%
					107	115	222	4.7%	4.8%	4.8%
					122	144	266	5.4%	6.0%	5.7%
					144	164	308	6.4%	6.8%	6.6%
					123	141	264	5.5%	5.8%	5.7%
					118	157	275	5.2%	6.5%	5.9%
					150	257	407	6.7%	10.7%	8.7%
					193	285	478	8.6%	11.8%	10.2%
					176	333	509	7.8%	13.8%	10.9%
					147	140	287	6.5%	5.8%	6.2%
					91	119	210	4.0%	4.9%	4.5%
					22	95	117	1.0%	3.9%	2.5%
					10	41	51	0.4%	1.7%	1.1%
					10	25	35	0.4%	1.0%	0.8%
					8	16	24	0.4%	0.7%	0.5%
	0	**0**	**0**	**0**	**2,253**	**2,412**	**4,665**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



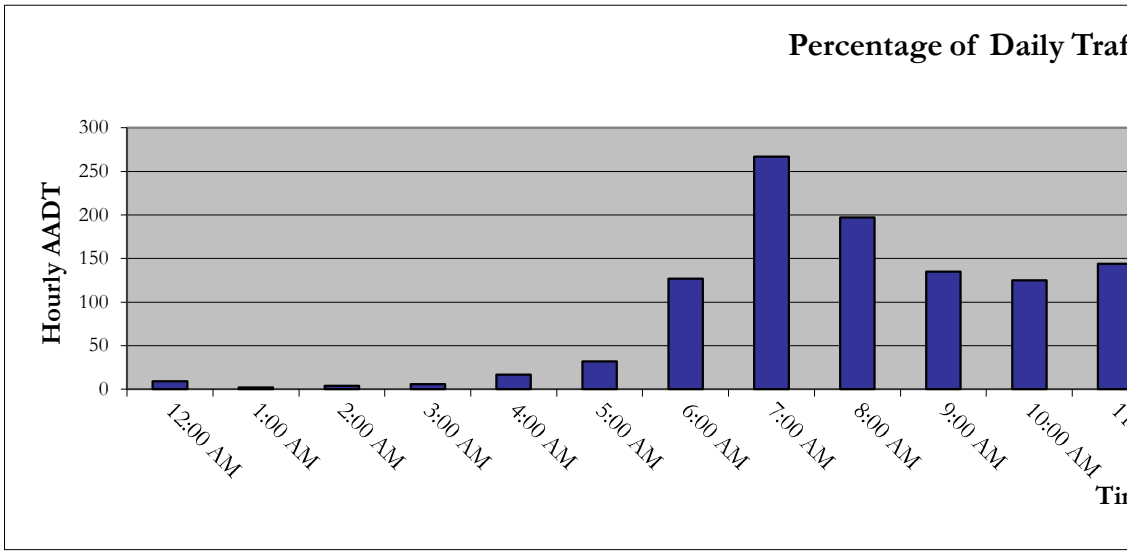
me of Day

VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	2/8/2024	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	2/4/2024 Sunday		2/5/2024 Monday		2/6/2024 Tuesday		2/7/2024 Wednesday		2/8/2024 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00									3	6
1:00									1	1
2:00									0	4
3:00									5	1
4:00									15	2
5:00									29	3
6:00									101	26
7:00									227	40
8:00									128	69
9:00									83	52
10:00									68	57
11:00									68	76
12:00									80	94
13:00									69	74
14:00									60	75
15:00									85	137
16:00									82	169
17:00									95	181
18:00									70	115
19:00									34	81
20:00									31	76
21:00									6	43
22:00									4	15
23:00									2	9
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,346**	**1,406**



NT SUMMARY

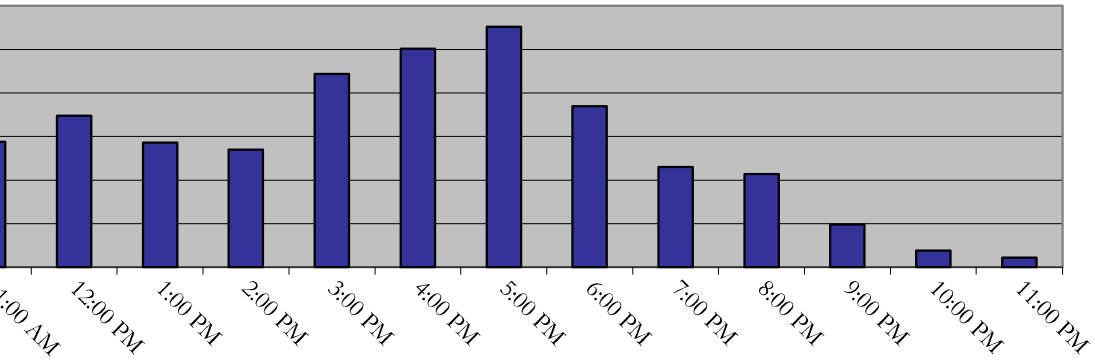
ocation: Rimrock Rd & 62ND ST West (South Leg) - West Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.010

	2/9/2024 Friday		2/10/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					3	6	9	0.2%	0.4%	0.3%
					1	1	2	0.1%	0.1%	0.1%
					0	4	4	0.0%	0.3%	0.1%
					5	1	6	0.4%	0.1%	0.2%
					15	2	17	1.1%	0.1%	0.6%
					29	3	32	2.2%	0.2%	1.2%
					101	26	127	7.5%	1.8%	4.6%
					227	40	267	16.9%	2.8%	9.7%
					128	69	197	9.5%	4.9%	7.2%
					83	52	135	6.2%	3.7%	4.9%
					68	57	125	5.1%	4.1%	4.5%
					68	76	144	5.1%	5.4%	5.2%
					80	94	174	5.9%	6.7%	6.3%
					69	74	143	5.1%	5.3%	5.2%
					60	75	135	4.5%	5.3%	4.9%
					85	137	222	6.3%	9.7%	8.1%
					82	169	251	6.1%	12.0%	9.1%
					95	181	276	7.1%	12.9%	10.0%
					70	115	185	5.2%	8.2%	6.7%
					34	81	115	2.5%	5.8%	4.2%
					31	76	107	2.3%	5.4%	3.9%
					6	43	49	0.4%	3.1%	1.8%
					4	15	19	0.3%	1.1%	0.7%
					2	9	11	0.1%	0.6%	0.4%
	0	0	0	0	1,346	1,406	2,752	100.0%	100.0%	100.0%

ffic Volume Per Hour



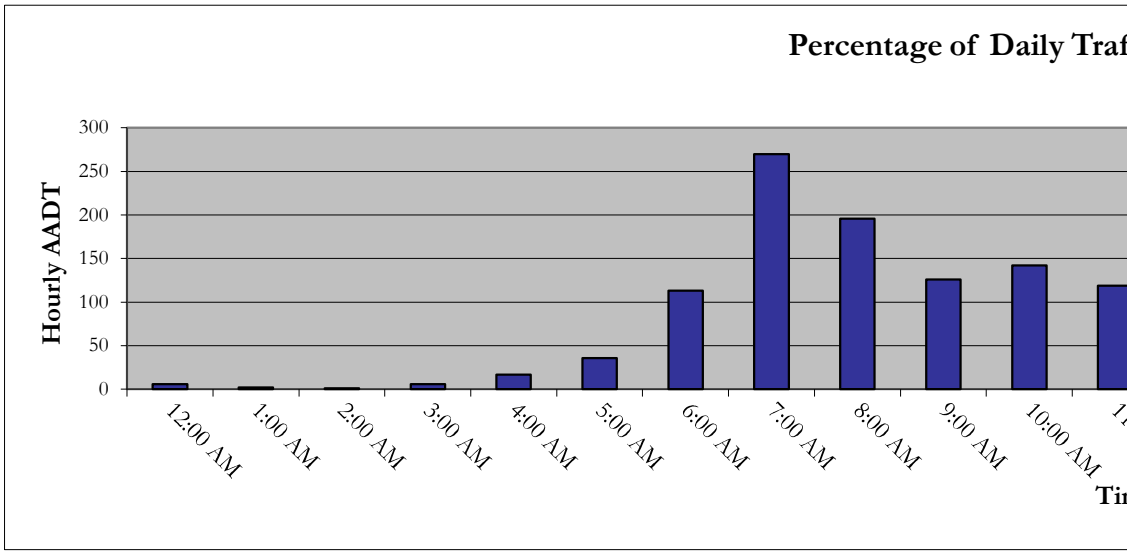
me of Day

VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	2/8/2024	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	2/4/2024 Sunday		2/5/2024 Monday		2/6/2024 Tuesday		2/7/2024 Wednesday		2/8/2024 Thursday	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
0:00									4	2
1:00									2	0
2:00									1	0
3:00									2	4
4:00									4	13
5:00									10	26
6:00									30	83
7:00									60	210
8:00									72	124
9:00									51	75
10:00									75	67
11:00									54	65
12:00									94	64
13:00									61	71
14:00									74	68
15:00									152	106
16:00									149	94
17:00									183	102
18:00									102	70
19:00									85	33
20:00									47	33
21:00									32	9
22:00									17	7
23:00									5	3
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,366**	**1,329**



NT SUMMARY

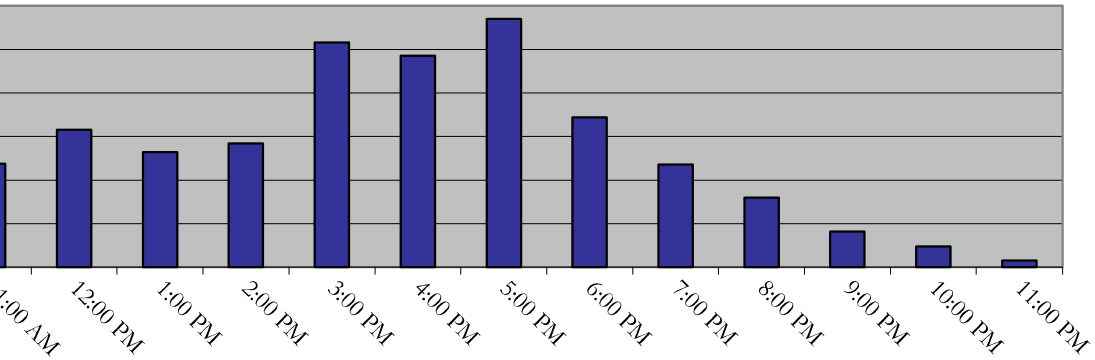
ocation: Rimrock Rd & 62ND ST West (South Leg) - South Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.010

	2/9/2024 Friday		2/10/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	NB	SB	NB	SB	NB	SB	ADT	NB	SB	ADT
					4	2	6	0.3%	0.2%	0.2%
					2	0	2	0.1%	0.0%	0.1%
					1	0	1	0.1%	0.0%	0.0%
					2	4	6	0.1%	0.3%	0.2%
					4	13	17	0.3%	1.0%	0.6%
					10	26	36	0.7%	2.0%	1.3%
					30	83	113	2.2%	6.2%	4.2%
					60	210	270	4.4%	15.8%	10.0%
					72	124	196	5.3%	9.3%	7.3%
					51	75	126	3.7%	5.6%	4.7%
					75	67	142	5.5%	5.0%	5.3%
					54	65	119	4.0%	4.9%	4.4%
					94	64	158	6.9%	4.8%	5.9%
					61	71	132	4.5%	5.3%	4.9%
					74	68	142	5.4%	5.1%	5.3%
					152	106	258	11.1%	8.0%	9.6%
					149	94	243	10.9%	7.1%	9.0%
					183	102	285	13.4%	7.7%	10.6%
					102	70	172	7.5%	5.3%	6.4%
					85	33	118	6.2%	2.5%	4.4%
					47	33	80	3.4%	2.5%	3.0%
					32	9	41	2.3%	0.7%	1.5%
					17	7	24	1.2%	0.5%	0.9%
					5	3	8	0.4%	0.2%	0.3%
0	**0**	**0**	**0**	**0**	**1,366**	**1,329**	**2,695**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



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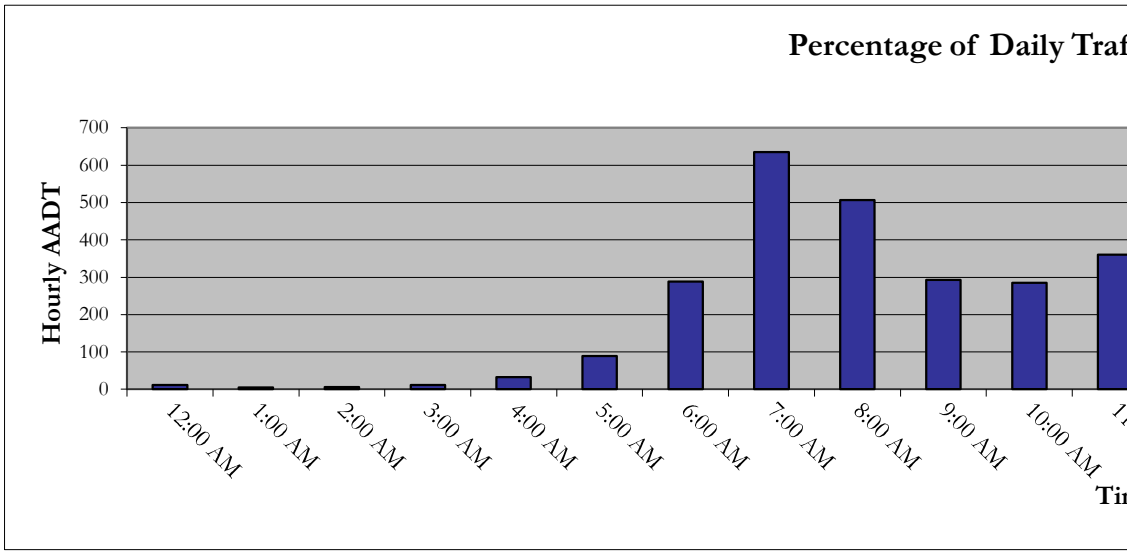
VOLUME COUN

General Information

Counted By:	Rafael Teixeira	Count L
Agency/Company:	Sanderson Stewart	
Dates Performed:	1/9/2024	Jurisdicti
Project Number:	23379	Street Cl
Project Description:	West Billings Neighborhood Plan	
		Seasonal

Hour Begin	1/9/2024 Sunday		1/10/2024 Monday		1/11/2024 Tuesday		1/12/2024 Wednesday		1/13/2024 Thursday	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
0:00					2	10				
1:00					3	2				
2:00					3	3				
3:00					11	1				
4:00					30	3				
5:00					77	12				
6:00					240	49				
7:00					535	100				
8:00					317	190				
9:00					171	122				
10:00					152	133				
11:00					189	172				
12:00					191	179				
13:00					176	183				
14:00					222	224				
15:00					193	324				
16:00					218	360				
17:00					206	413				
18:00					156	253				
19:00					82	194				
20:00					50	178				
21:00					19	75				
22:00					11	47				
23:00					9	22				
TOTAL	**0**	**0**	**0**	**0**	**3,263**	**3,249**	**0**	**0**	**0**	**0**

Percentage of Daily Traf



NT SUMMARY

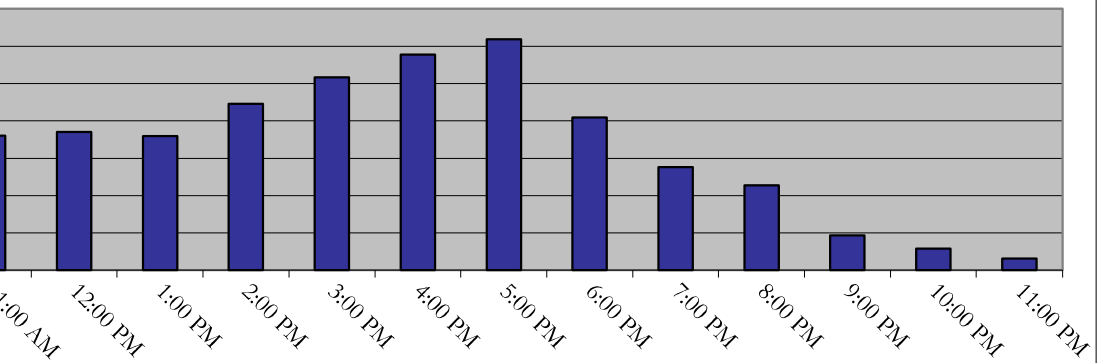
ocation: Rimrock Rd & 54TH ST West - West Leg

on: City of Billings, MT / MDT
assification: Principal Arterial

Count Factor: 1.040

	1/14/2024 Friday		1/15/2024 Saturday		Annual Average Daily Traffic (AADT)			Hourly Percentage of Total (%)		
	EB	WB	EB	WB	EB	WB	ADT	EB	WB	ADT
					2	10	12	0.1%	0.3%	0.2%
					3	2	5	0.1%	0.1%	0.1%
					3	3	6	0.1%	0.1%	0.1%
					11	1	12	0.3%	0.0%	0.2%
					30	3	33	0.9%	0.1%	0.5%
					77	12	89	2.4%	0.4%	1.4%
					240	49	289	7.4%	1.5%	4.4%
					535	100	635	16.4%	3.1%	9.8%
					317	190	507	9.7%	5.8%	7.8%
					171	122	293	5.2%	3.8%	4.5%
					152	133	285	4.7%	4.1%	4.4%
					189	172	361	5.8%	5.3%	5.5%
					191	179	370	5.9%	5.5%	5.7%
					176	183	359	5.4%	5.6%	5.5%
					222	224	446	6.8%	6.9%	6.8%
					193	324	517	5.9%	10.0%	7.9%
					218	360	578	6.7%	11.1%	8.9%
					206	413	619	6.3%	12.7%	9.5%
					156	253	409	4.8%	7.8%	6.3%
					82	194	276	2.5%	6.0%	4.2%
					50	178	228	1.5%	5.5%	3.5%
					19	75	94	0.6%	2.3%	1.4%
					11	47	58	0.3%	1.4%	0.9%
					9	22	31	0.3%	0.7%	0.5%
	0	**0**	**0**	**0**	**3,263**	**3,249**	**6,512**	**100.0%**	**100.0%**	**100.0%**

ffic Volume Per Hour



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COUNT LOCATIONS

Link	Location ID	Functional Class	Location On	Loc Al
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-351	56-4A-351	Minor Collector	CENTRAL AVE	W of 5
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-352	56-4A-352	Minor Collector	CENTRAL AVE	E of 5
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-353	56-4A-353	Minor Collector	56TH ST W	N of C
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-354	56-4A-354	Minor Collector	56TH ST W	S of C
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-355	56-4A-355	Minor Collector	62nd ST W	N of G
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-356	56-4A-356	Minor Arterial	Rimrock RD	62nd
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-357	56-4A-357	Minor Collector	GRAND AVE	E of 6
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-358	56-4A-358	Local	54th ST W	S of R
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-359	56-4A-359	Local	58TH ST W	N of K
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-360	56-4A-360	Minor Collector	56TH ST W	S of G
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-361	56-4A-361	Minor Collector	GRAND AVE	W of 5
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-362	56-4A-362	Local	HESPER RD	W of 5
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-363	56-4A-363	Minor Collector	56TH ST W	S of H
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-364	56-4A-364	Local	HESPER RD	E of 5
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-365	56-4A-365	Major Collector	ROUTE 532	E of 5
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-366	56-4A-366	Major Collector	ROUTE 532	btwn
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-367	56-4A-367	Local	64TH ST W	N of H
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-368	56-4A-368	Local	64TH ST W	N of M
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-369	56-4A-369	Local	64TH ST W	S of K
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-374	56-4A-374	Local	54TH ST W	N of G
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-375	56-4A-375	Local	54th ST W	N of R
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-376	56-4A-376	Minor Collector	GRAND AVE	E of 5
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-377	56-4A-377	Local	48TH ST W	N of C
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-378	56-4A-378	Local	48TH ST W	N of H
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-379	56-4A-379	Local	48TH ST W	N of M
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-380	56-4A-380	Local	48TH ST W	S of C
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-381	56-4A-381	Local	48TH ST W	S of G
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-382	56-4A-382	Local	48TH ST W	S of K
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-383	56-4A-383	Minor Collector	NIEBAUER RD	W of 4
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-384	56-4A-384	Major Collector	GRAND AVE	W of 4
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-389	56-4A-389	Minor Collector	56TH ST W	S of K
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-393	56-4A-393	Minor Collector	64th St W	S of G
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-394	56-4A-394	Minor Collector	64th St W	N of K
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-085	56-4A-085	Minor Collector	GRAND AVE	3.5 m
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-112	56-4A-112	Minor Arterial	Rimrock RD	E of 5
http://www.ms2soft.com/tcds/?loc=Mdt&mod=tcds&local_id=56-4A-342	56-4A-342	Local	Rimrock RD	W of 6
	56-4A-123	Local	NIEBAUER RD	SW of
	56-4A-122	Minor Arterial	SHILOH ROAD	at I-90

(-) -- 2022 Data was projected by MDT

ias	2022 AADT	2023 count 1	Count 1 date	2023 count 2	Count 2 date	2023 count 3	Count 3 date	Consider ?
56th AV	945	1582	8/14/2023	1602	8/15/2023			YES
6th Av	2273	3122	8/14/2023	3201	8/15/2023			YES
Central Av	2583	4300	8/14/2023	4063	8/15/2023			YES
entral Av	3293	3735	8/14/2023	3575	8/15/2023			YES
Grand Av	2848	2890	9/25/2023	2947	9/26/2023	2994	9/27/2023	YES
ST W	-2134							NO
2nd St W	5312							YES
imrock RD	3344							YES
it Ln	-420	510	4/24/2023	589	4/25/2023			NEW IN 2023
rand Ave	-4252	4413	4/24/2023	4512	4/25/2023			NEW IN 2023
56th St W	6335							YES
56th St W	-2022	3060	4/24/2023	3170	4/25/2023			NEW IN 2023
esper Rd	-2785							NO
6th St W	-2159							NO
6th St W	6038	11162	4/24/2023	11351	4/25/2023			YES
S64th St W & Ollie St	7011	7782	4/24/2023	7960	4/25/2023			YES
Nesper Rd	1944	2517	4/24/2023	2606	4/25/2023			YES
Neibauer Rd	-876							NO
ing Ave W	-1758							NO
Grand Ave	3977							YES
Limrock Av	3176							YES
4th St W	8810							YES
Central Ave	3029	4938	4/24/2023	5033	4/25/2023			YES
Nesper RD	2051	2377	4/24/2023	2363	4/25/2023			YES
Neibauer Rd	1146	1075	4/10/2023	920	4/11/2023			YES
entral Ave	4548	3546	4/10/2023	3677	4/11/2023			YES
rand Ave	4097							YES
ing Avve	2274							YES
48th St W	2418	3168	4/10/2023	3340	4/11/2023	3135	4/12/2023	YES
48th St W	14060	13400	4/10/2023	14556	4/11/2023			YES
ing AVE W	-3430							NO
rand Ave	-5081	5479	4/10/2023	5833	4/11/2023			NEW IN 2023
Ling Ave W	-3573	5325	4/10/2023	5096	4/11/2023			NEW IN 2023
i W of Shiloh Rd	2723	3823	8/14/2023	4072	8/15/2023			YES
4th	-11420							NO
62nd St W	-2413							NO
f Shiloh Rd	3076							YES
0 separation	-2158	3814	627/2023	4014	6/28/2023			NEW IN 2023

Bike and Pedestrian:

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

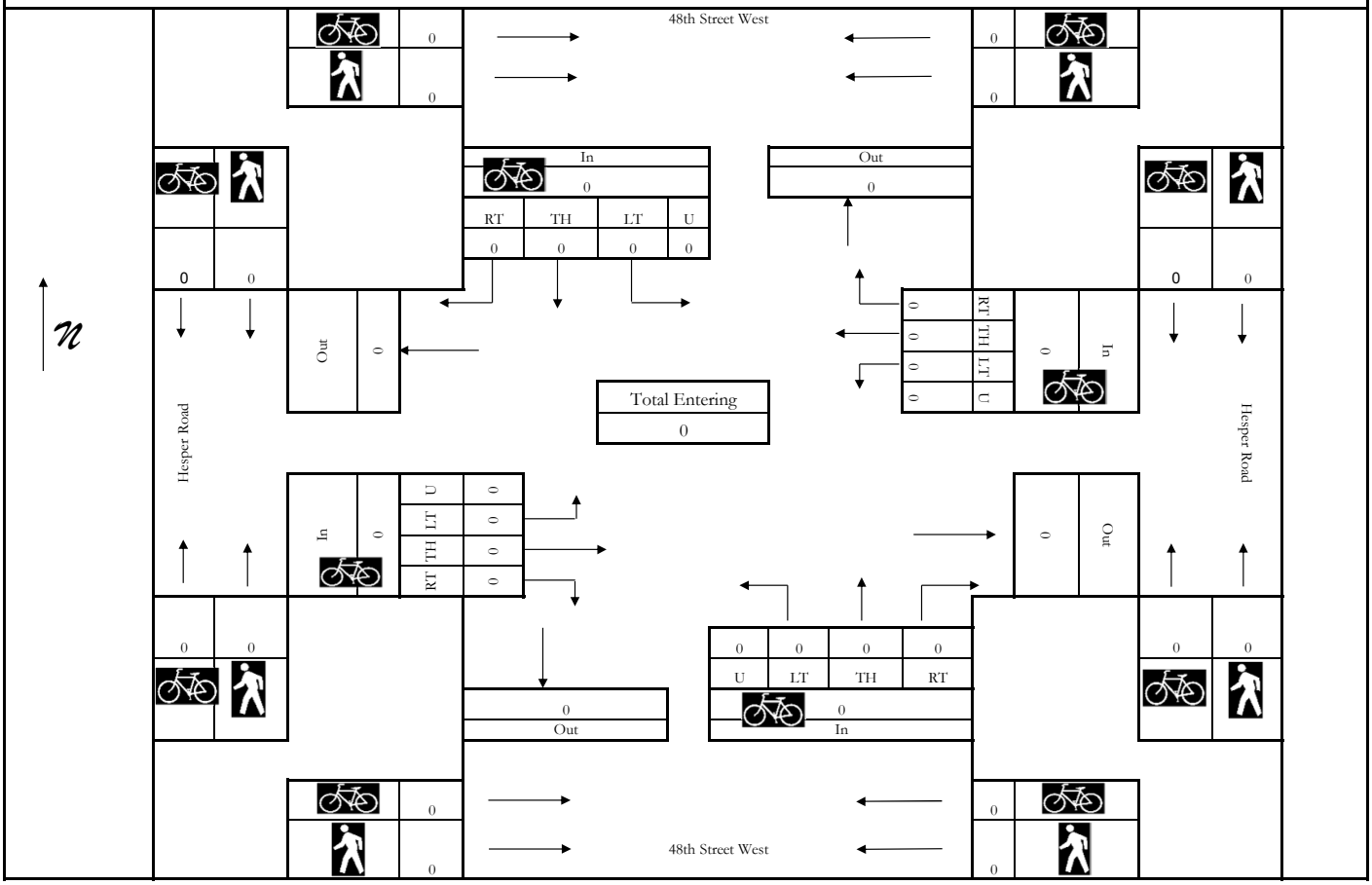
Counted By:	Rafael Teixeira	Intersection:	Hesper Road & 48th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48th Street West	East/West Street:	Hesper Road

Bikes in Roadway

	48th Street West Southbound					48th Street West Northbound					Hesper Road Eastbound					Hesper Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	48th Street West Southbound					48th Street West Northbound					Hesper Road Eastbound					Hesper Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

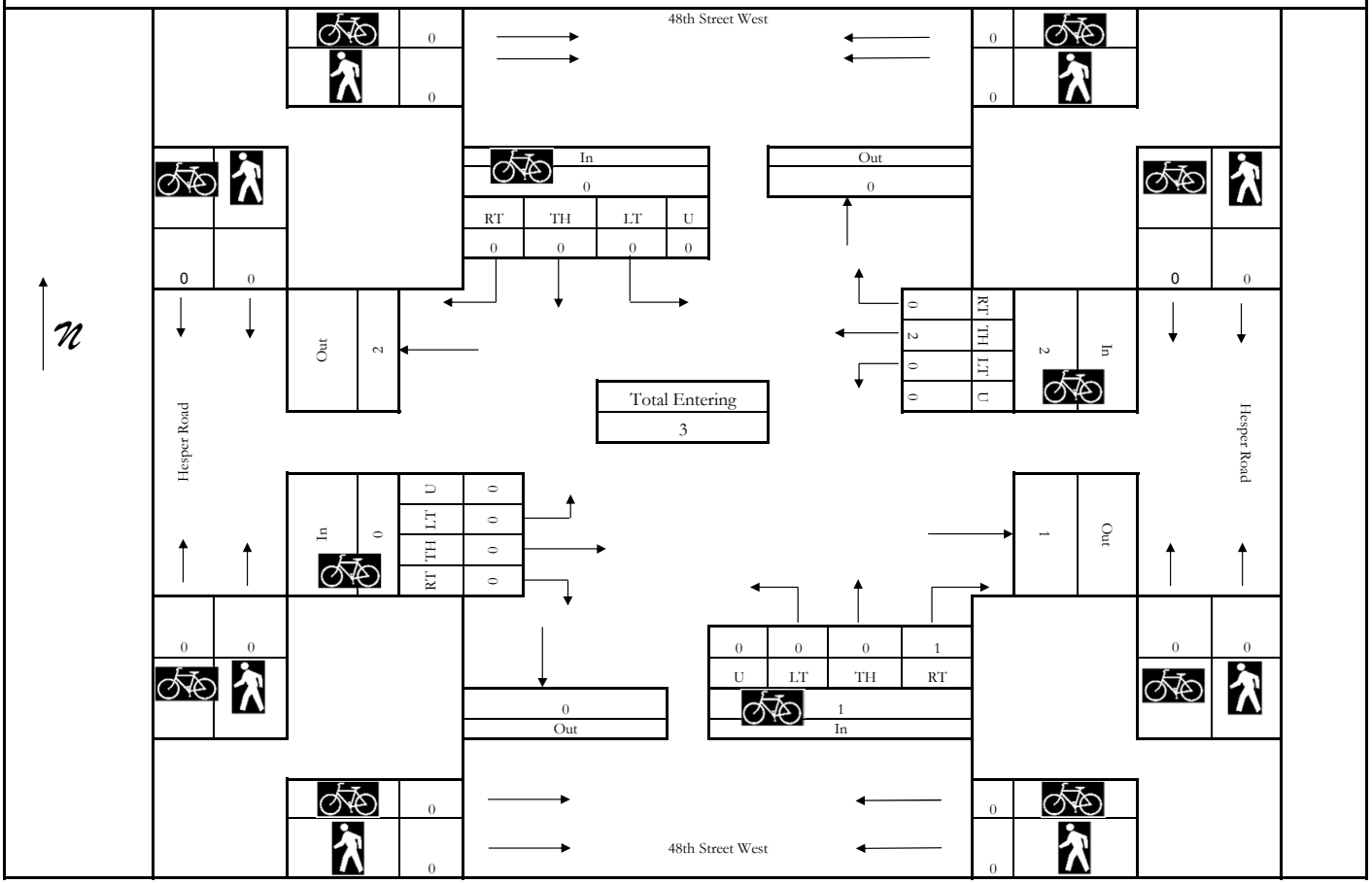
Counted By:	Rafael Teixeira	Intersection:	Hesper Road & 48th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48th Street West	East/West Street:	Hesper Road

Bikes in Roadway

	48th Street West Southbound					48th Street West Northbound					Hesper Road Eastbound					Hesper Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Grand Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2	0	0	2	3

Bikes & Pedestrians in Crosswalk

	48th Street West Southbound					48th Street West Northbound					Hesper Road Eastbound					Hesper Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

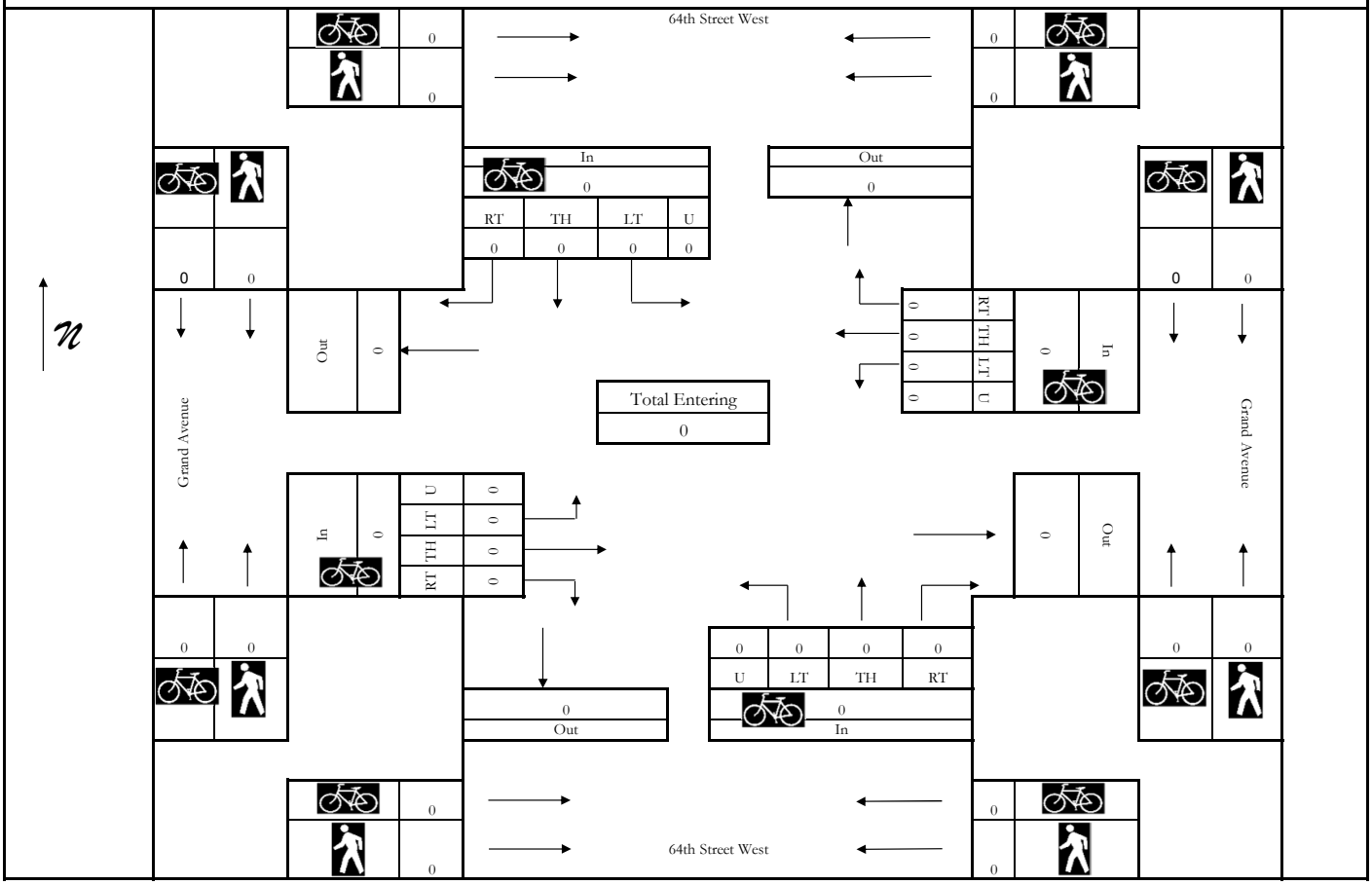
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 64th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 16, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64th Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	64th Street West Southbound					64th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	64th Street West Southbound					64th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

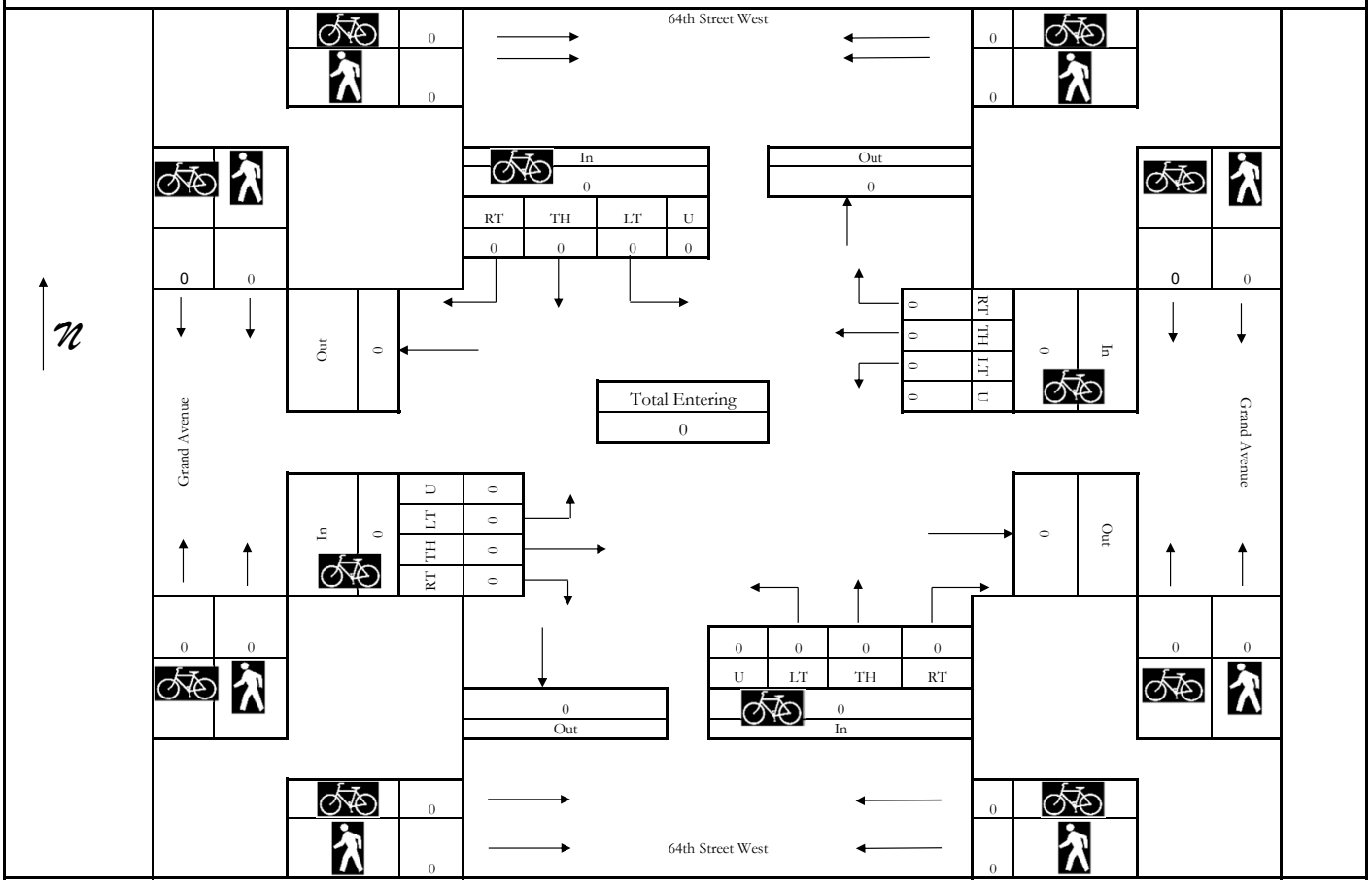
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 64th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 16, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64th Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	64th Street West Southbound					64th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	64th Street West Southbound					64th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

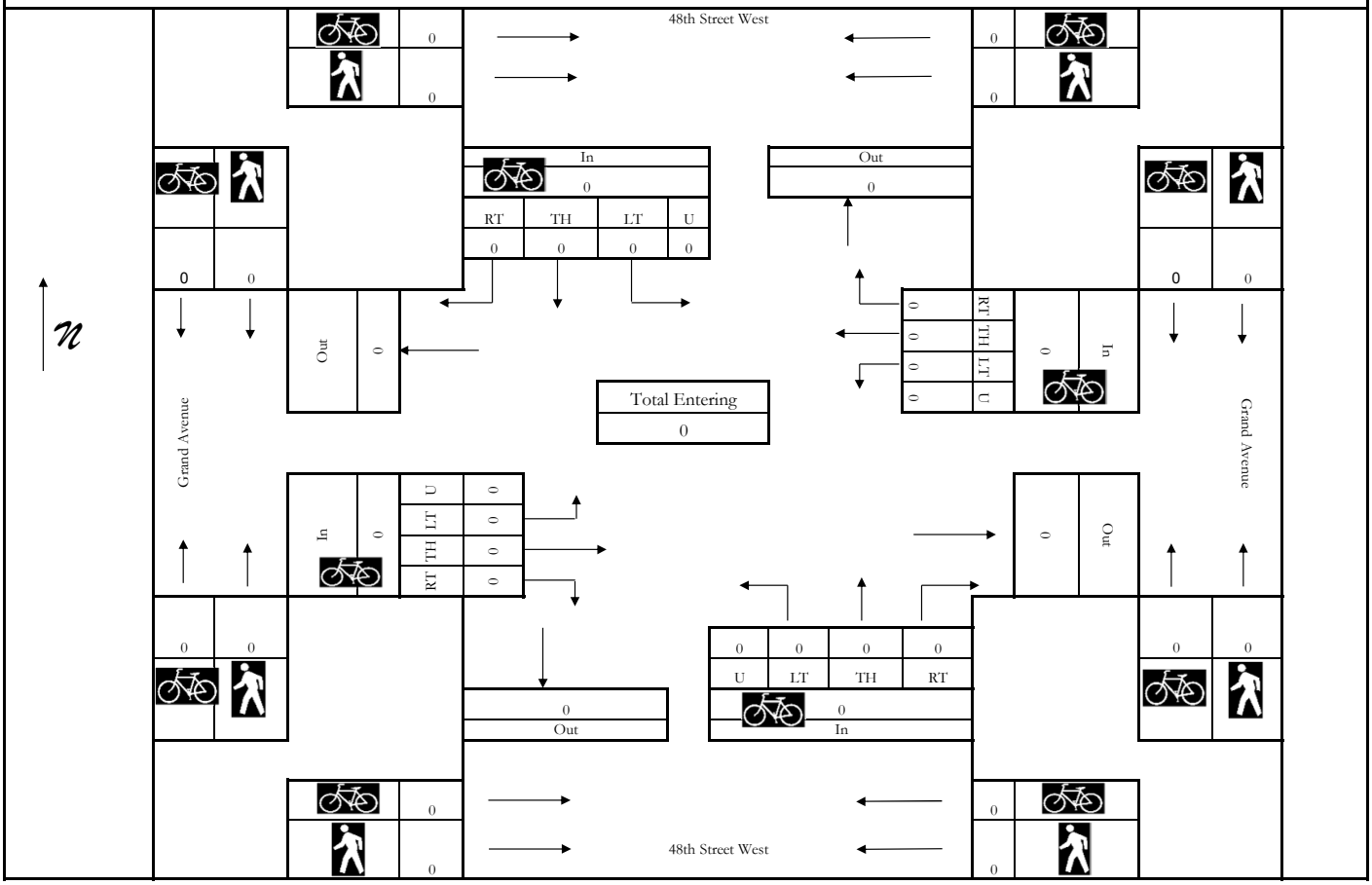
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 48th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48th Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	48th Street West Southbound					48th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	48th Street West Southbound					48th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

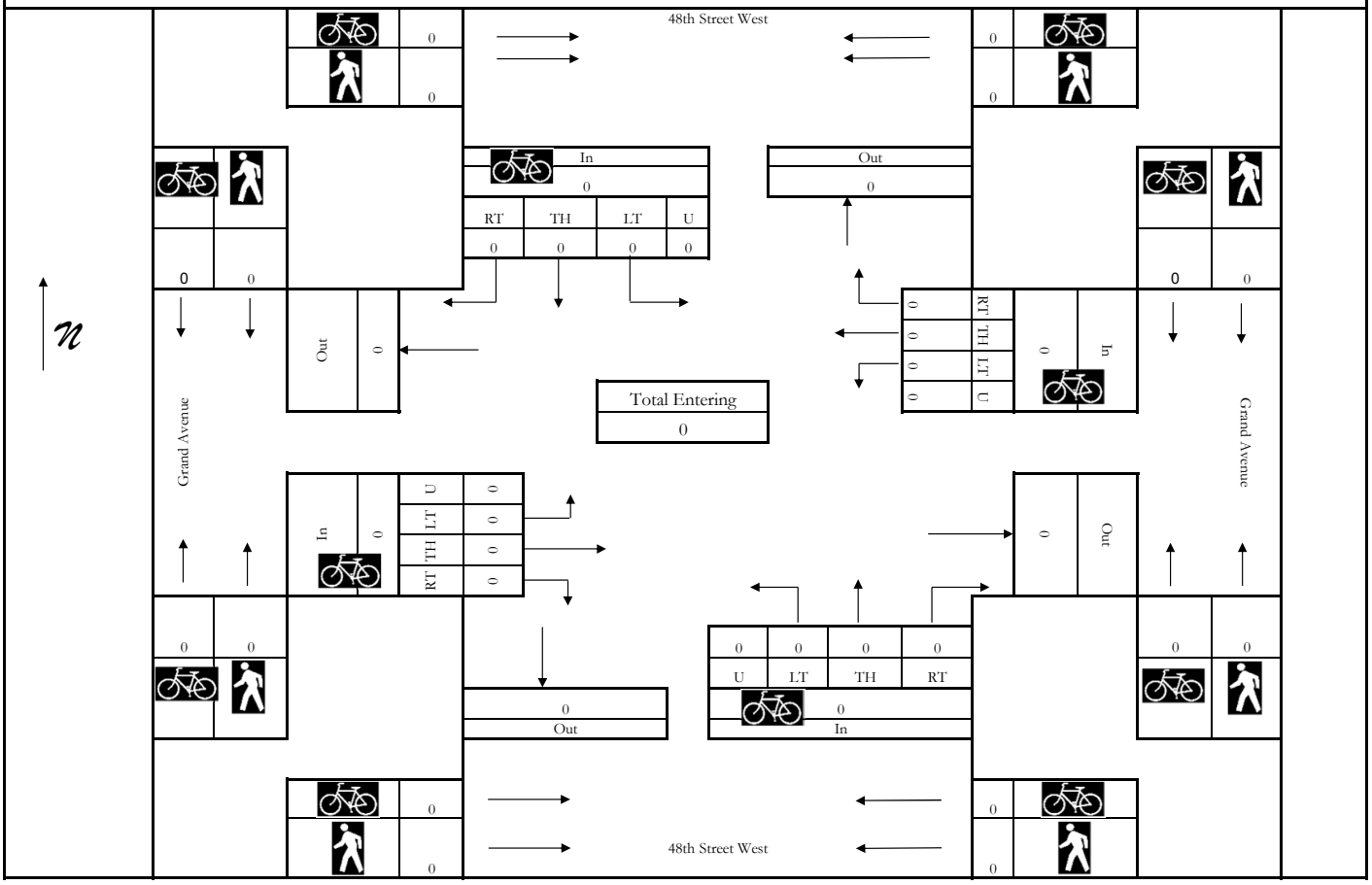
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 48th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48th Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	48th Street West Southbound					48th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	48th Street West Southbound					48th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

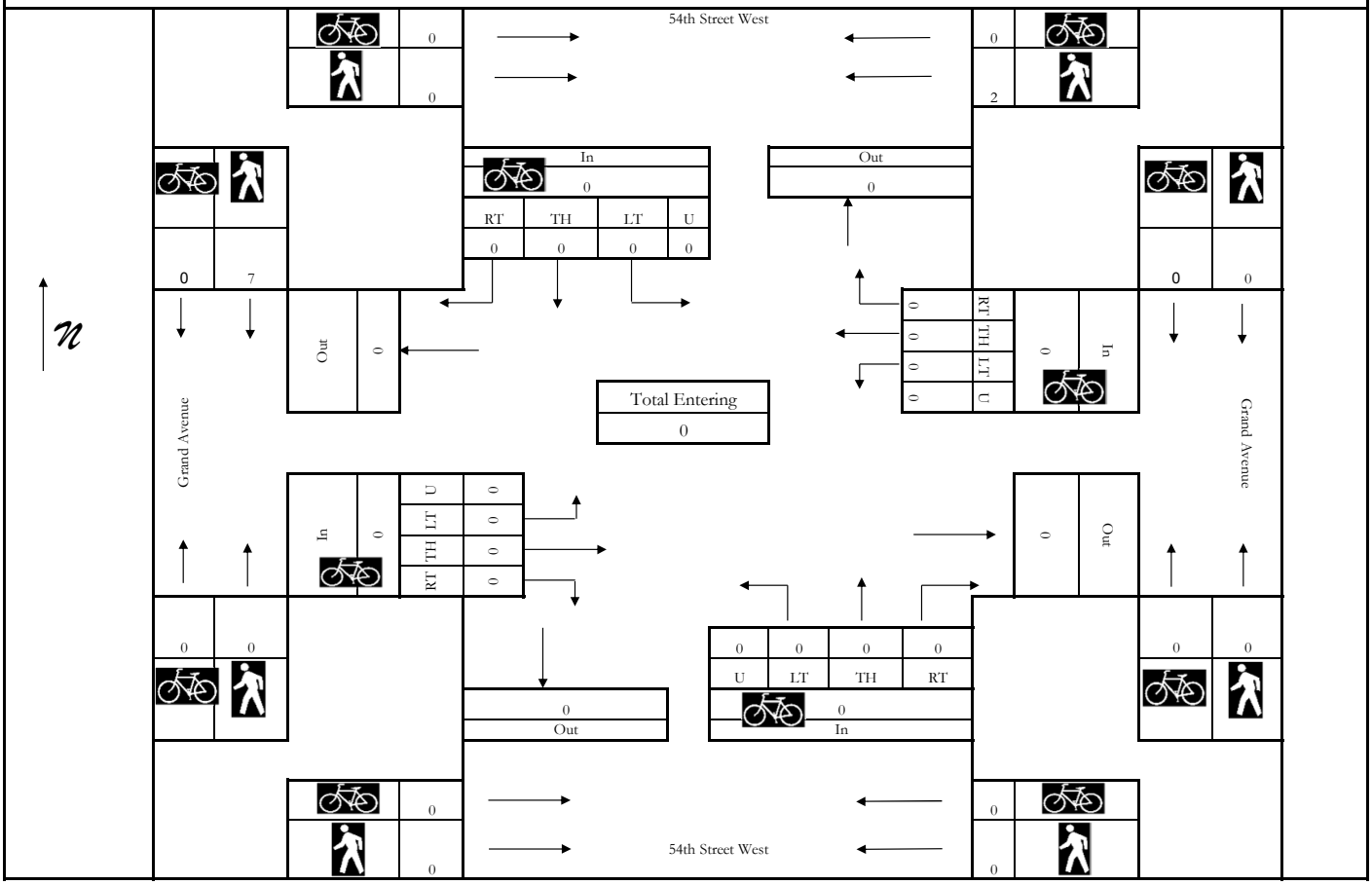
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 54th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54th Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	54th Street West Southbound					54th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	54th Street West Southbound					54th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
7:45 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	8
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	2	2	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	9



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

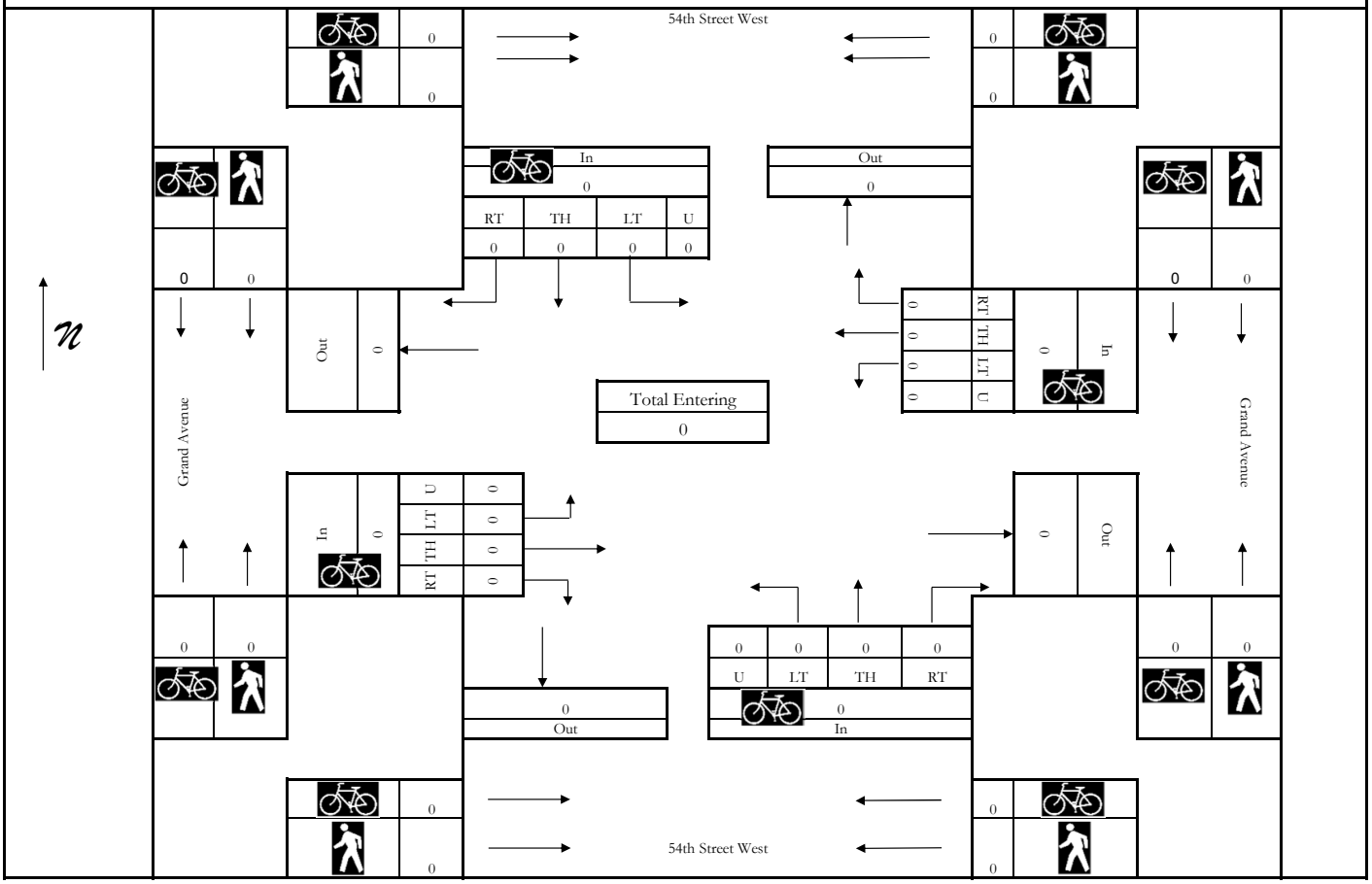
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 54th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54th Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	54th Street West Southbound					54th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	54th Street West Southbound					54th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

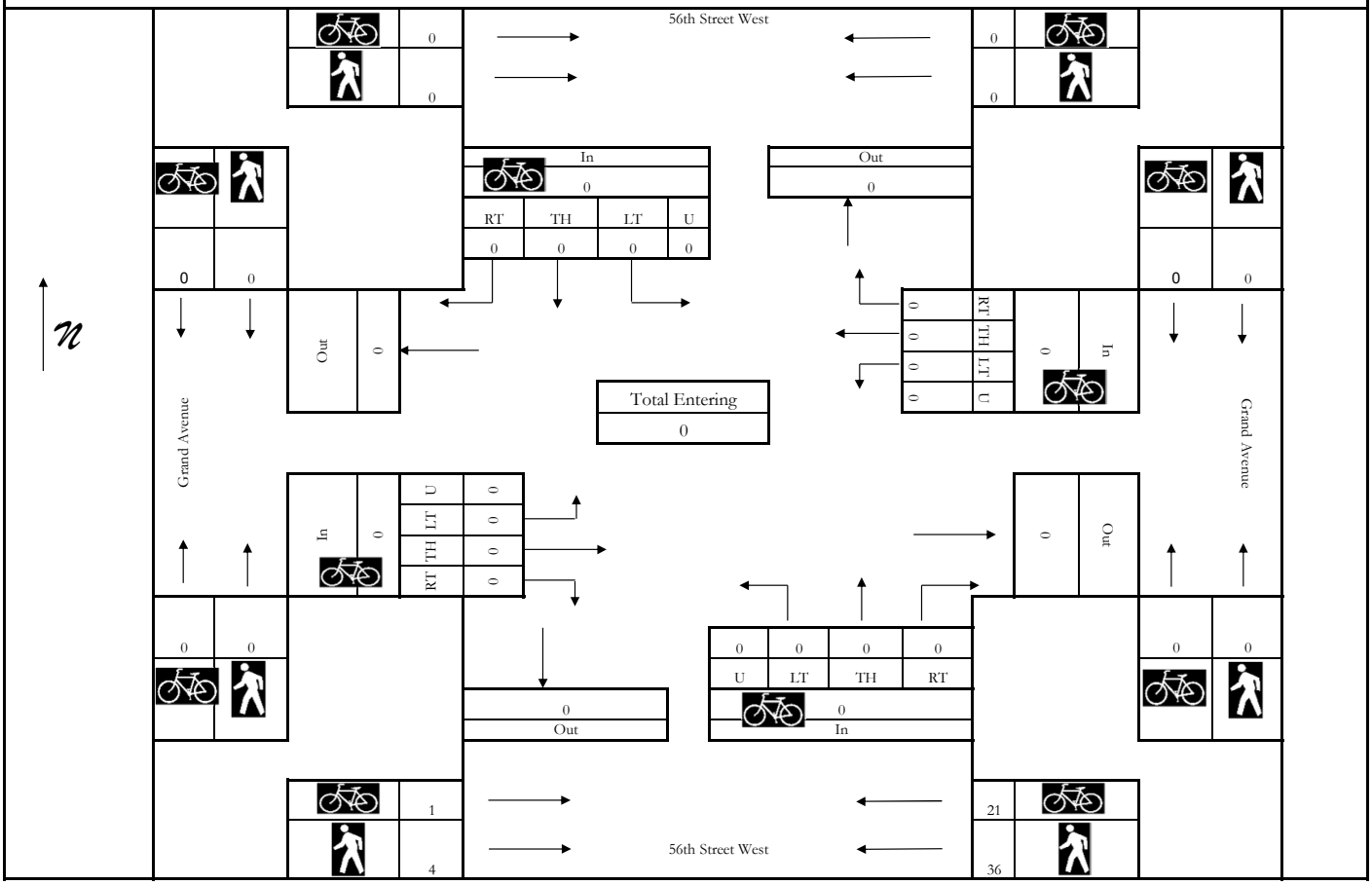
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 56th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, May 16, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56th Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	56th Street West Southbound					56th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	56th Street West Southbound					56th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	6
7:30 AM	0	0	0	0	0	2	11	0	4	17	0	0	0	0	0	0	0	0	0	0	17
7:45 AM	0	0	0	0	0	10	15	0	0	25	0	0	0	0	0	0	0	0	0	0	25
8:00 AM	0	0	0	0	0	9	4	1	0	14	0	0	0	0	0	0	0	0	0	0	14
Grand Total	0	0	0	0	0	21	36	1	4	62	0	0	0	0	0	0	0	0	0	0	62



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

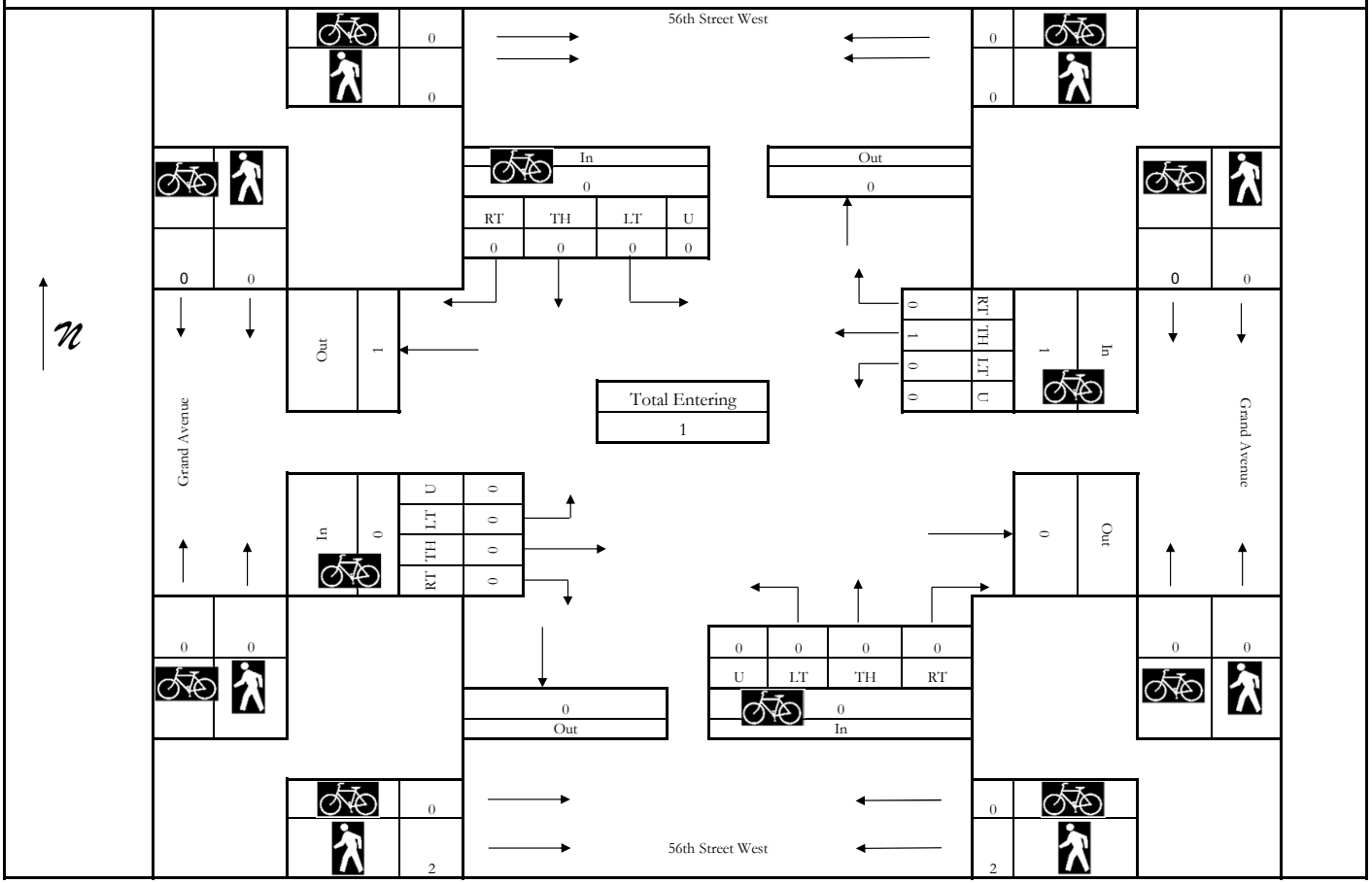
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 56th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, May 16, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56th Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	56th Street West Southbound					56th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1

Bikes & Pedestrians in Crosswalk

	56th Street West Southbound					56th Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	2	0	2	4	0	0	0	0	0	0	0	0	0	0	4
Grand Total	0	0	0	0	0	0	2	0	2	4	0	0	0	0	0	0	0	0	0	0	4



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

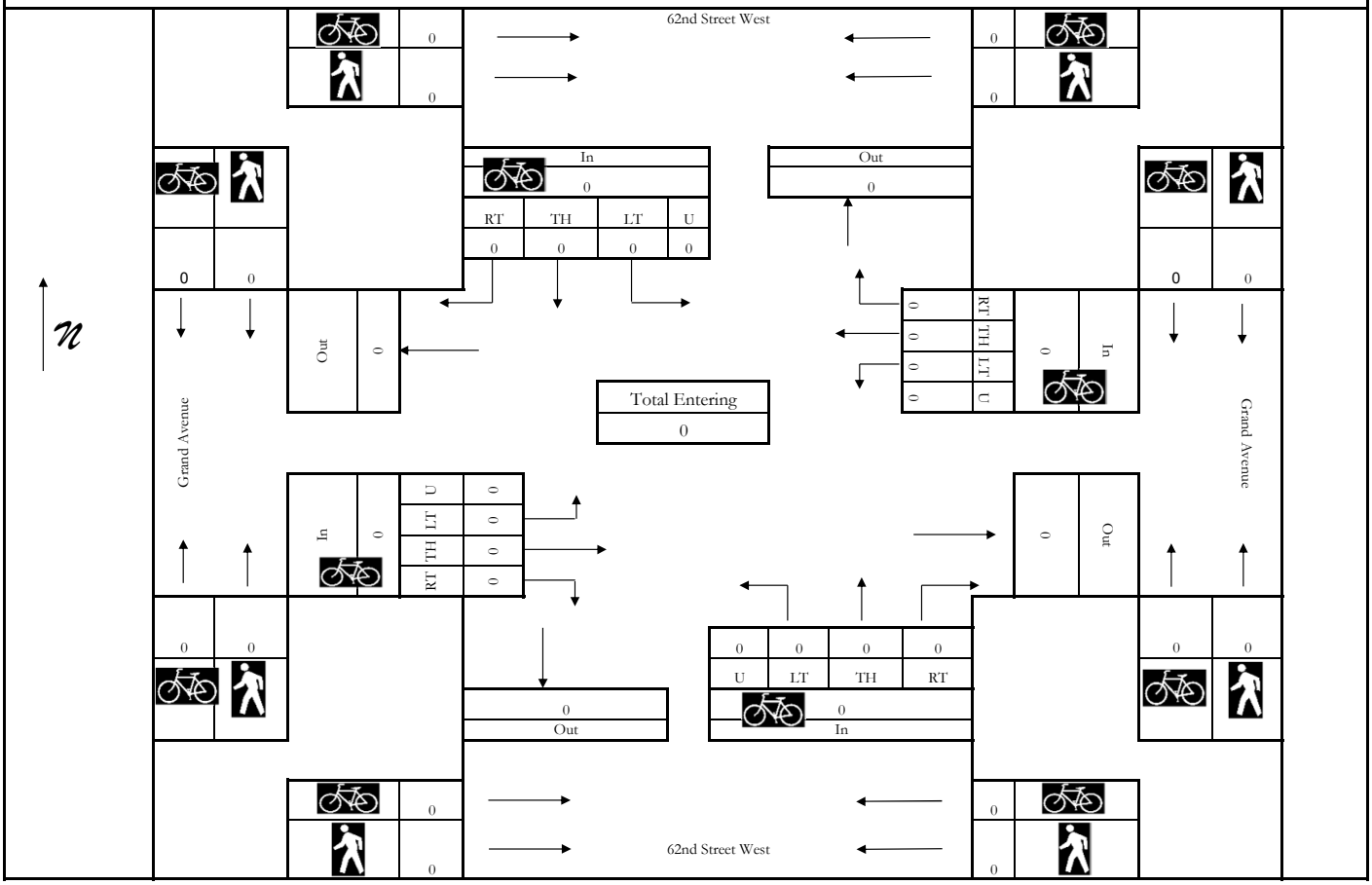
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 62nd Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	62nd Street West Southbound					62nd Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	62nd Street West Southbound					62nd Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

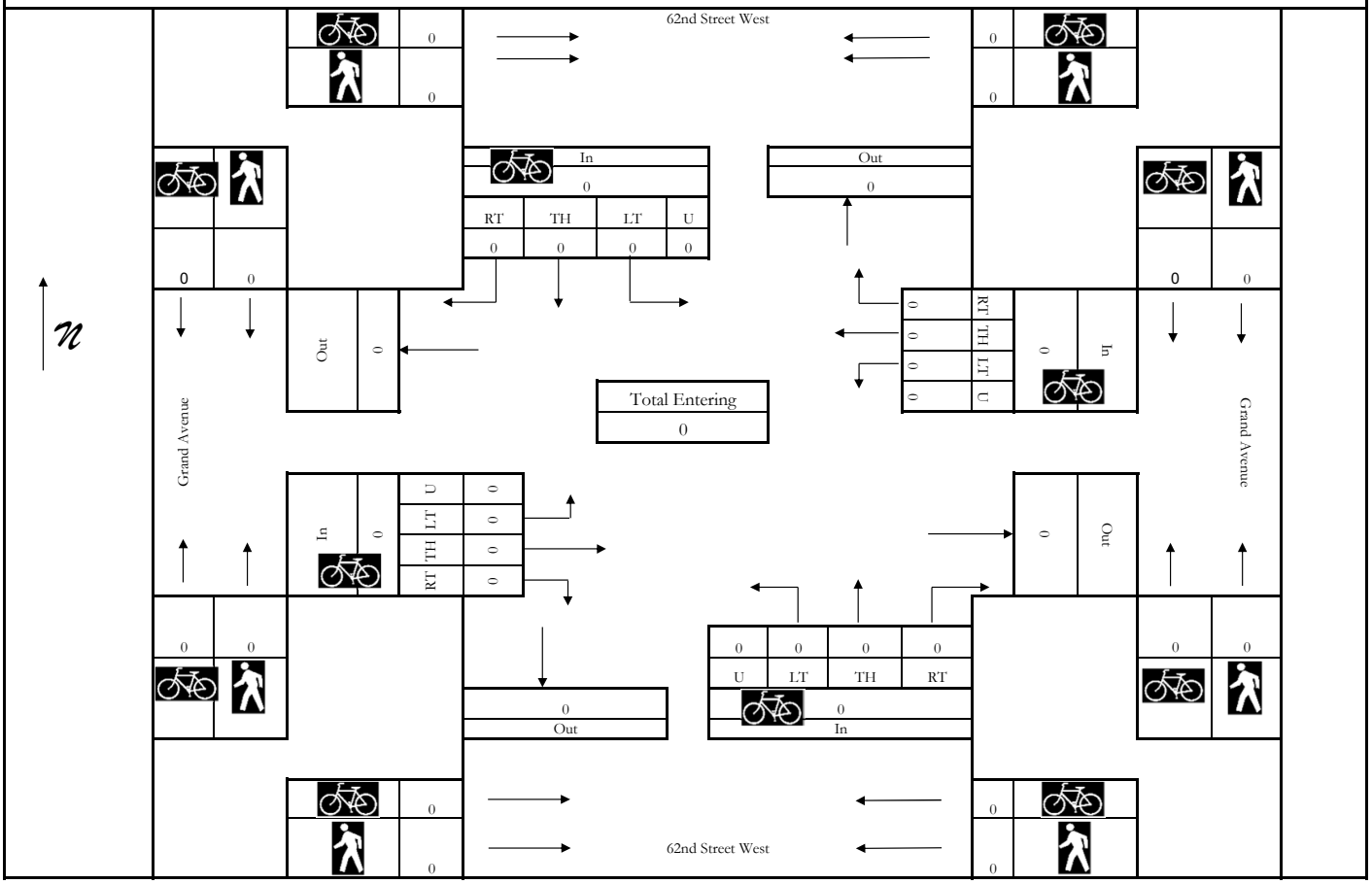
Counted By:	Rafael Teixeira	Intersection:	Grand Avenue & 62nd Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Grand Avenue

Bikes in Roadway

	62nd Street West Southbound					62nd Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	62nd Street West Southbound					62nd Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

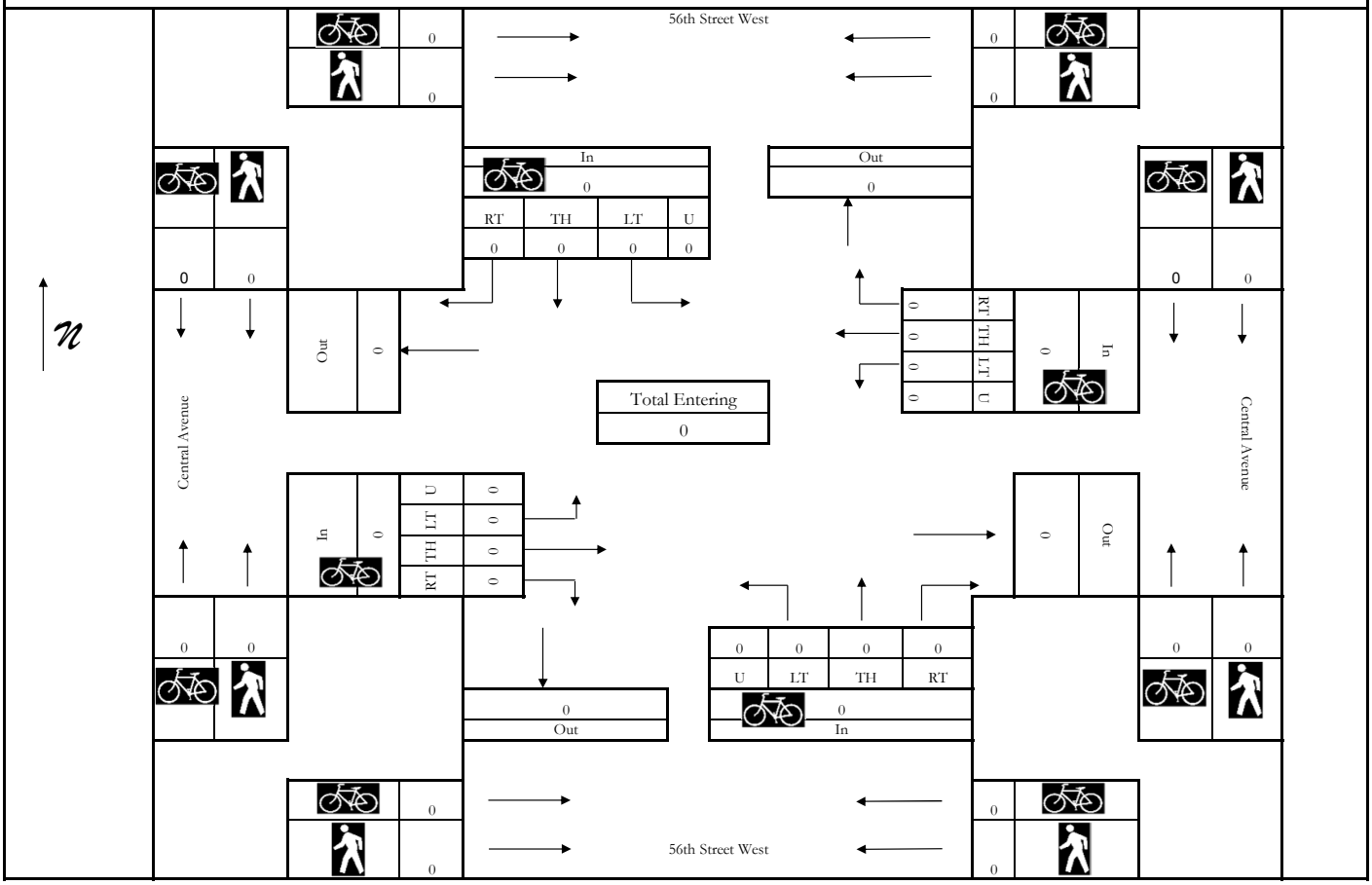
Counted By:	Rafael Teixeira	Intersection:	Central Avenue & 56th Street West
Agency/Company:	Sanbell		
Date Performed:	Thursday, January 11, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56th Street West	East/West Street:	Central Avenue

Bikes in Roadway

	56th Street West Southbound					56th Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	56th Street West Southbound					56th Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

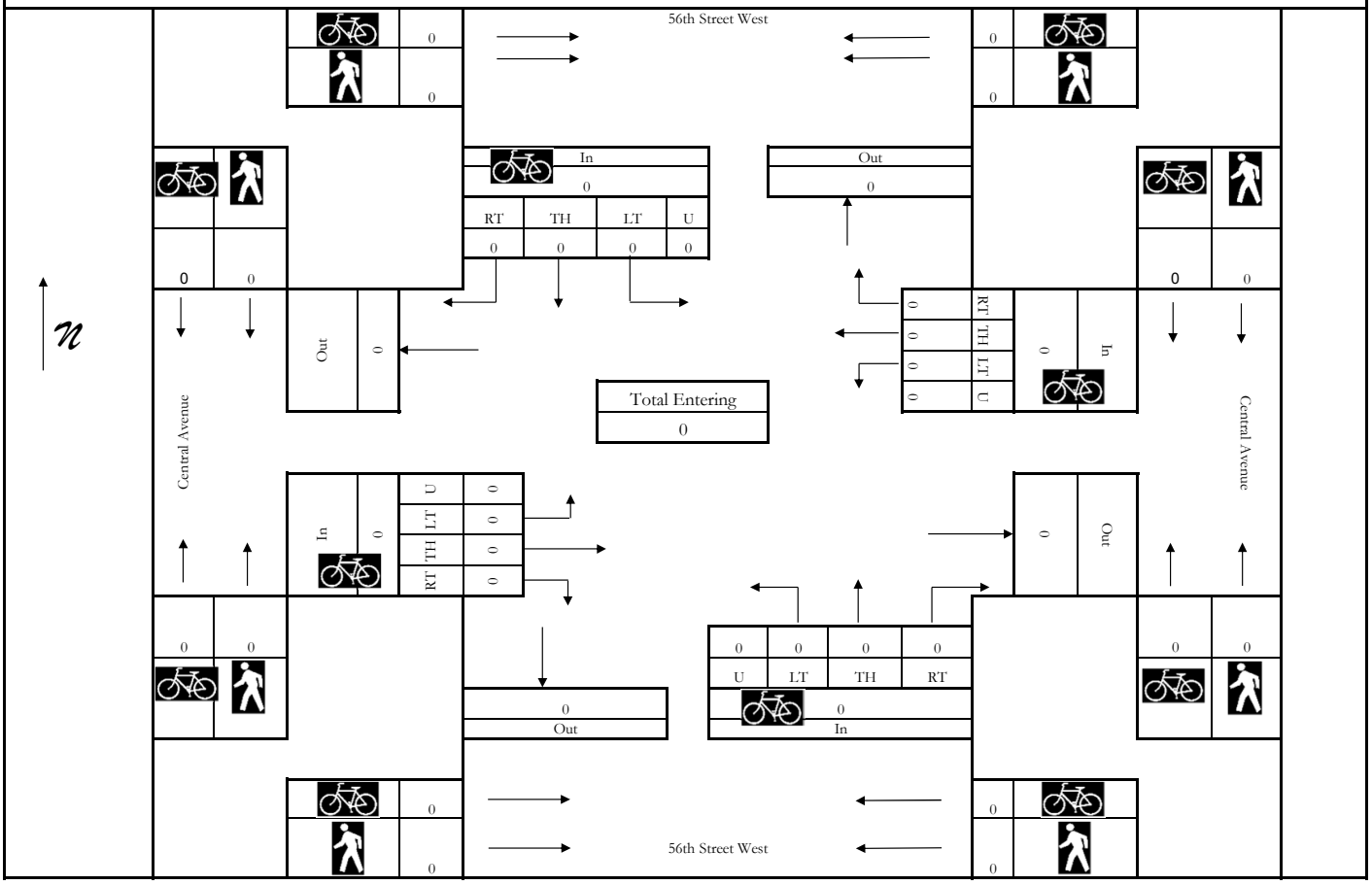
Counted By:	Rafael Teixeira	Intersection:	Central Avenue & 56th Street West
Agency/Company:	Sanbell		
Date Performed:	Thursday, January 11, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56th Street West	East/West Street:	Central Avenue

Bikes in Roadway

	56th Street West Southbound					56th Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	56th Street West Southbound					56th Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

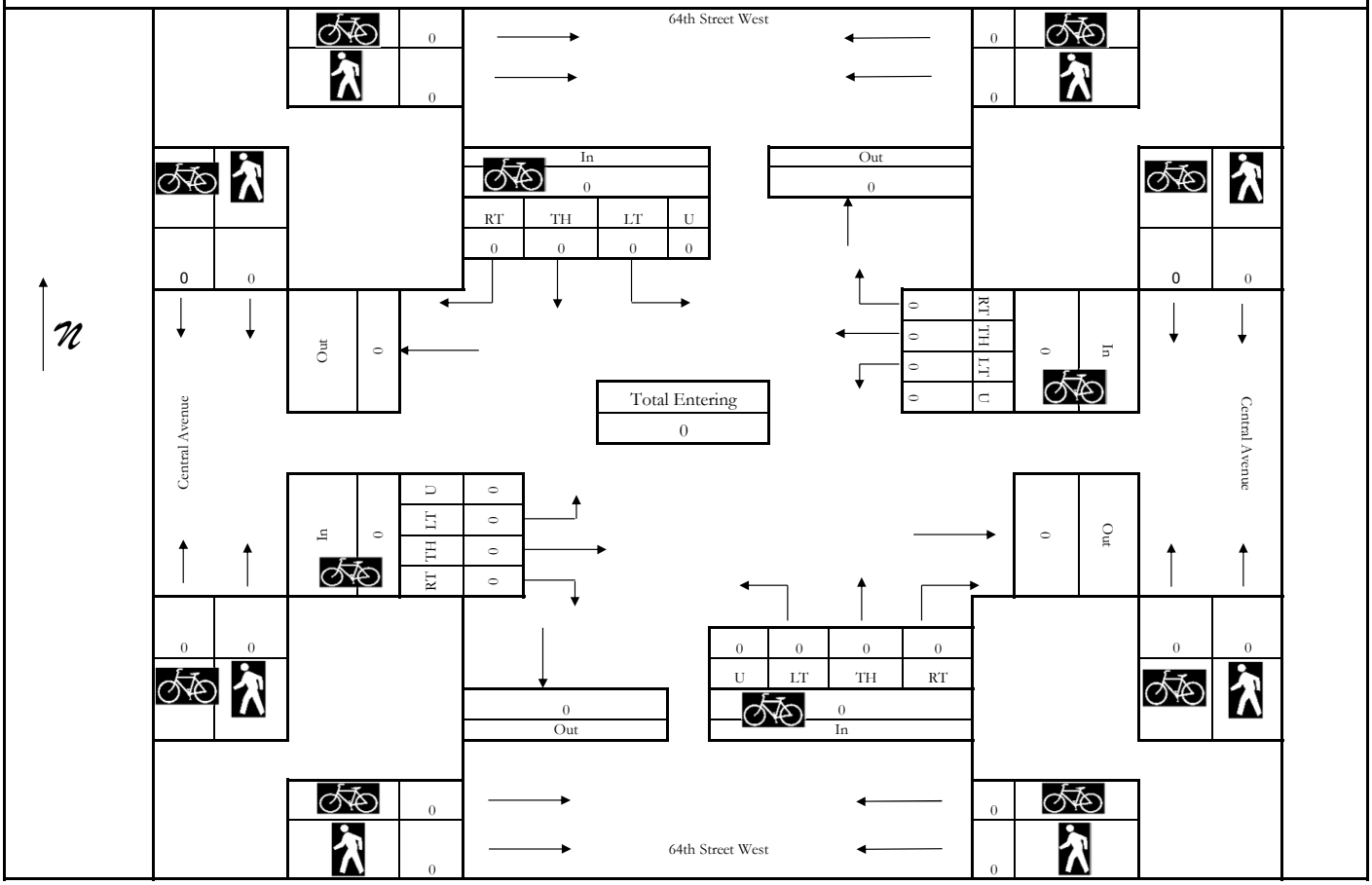
Counted By:	Rafael Teixeira	Intersection:	Central Avenue & 64th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64th Street West	East/West Street:	Central Avenue

Bikes in Roadway

	64th Street West Southbound					64th Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	64th Street West Southbound					64th Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

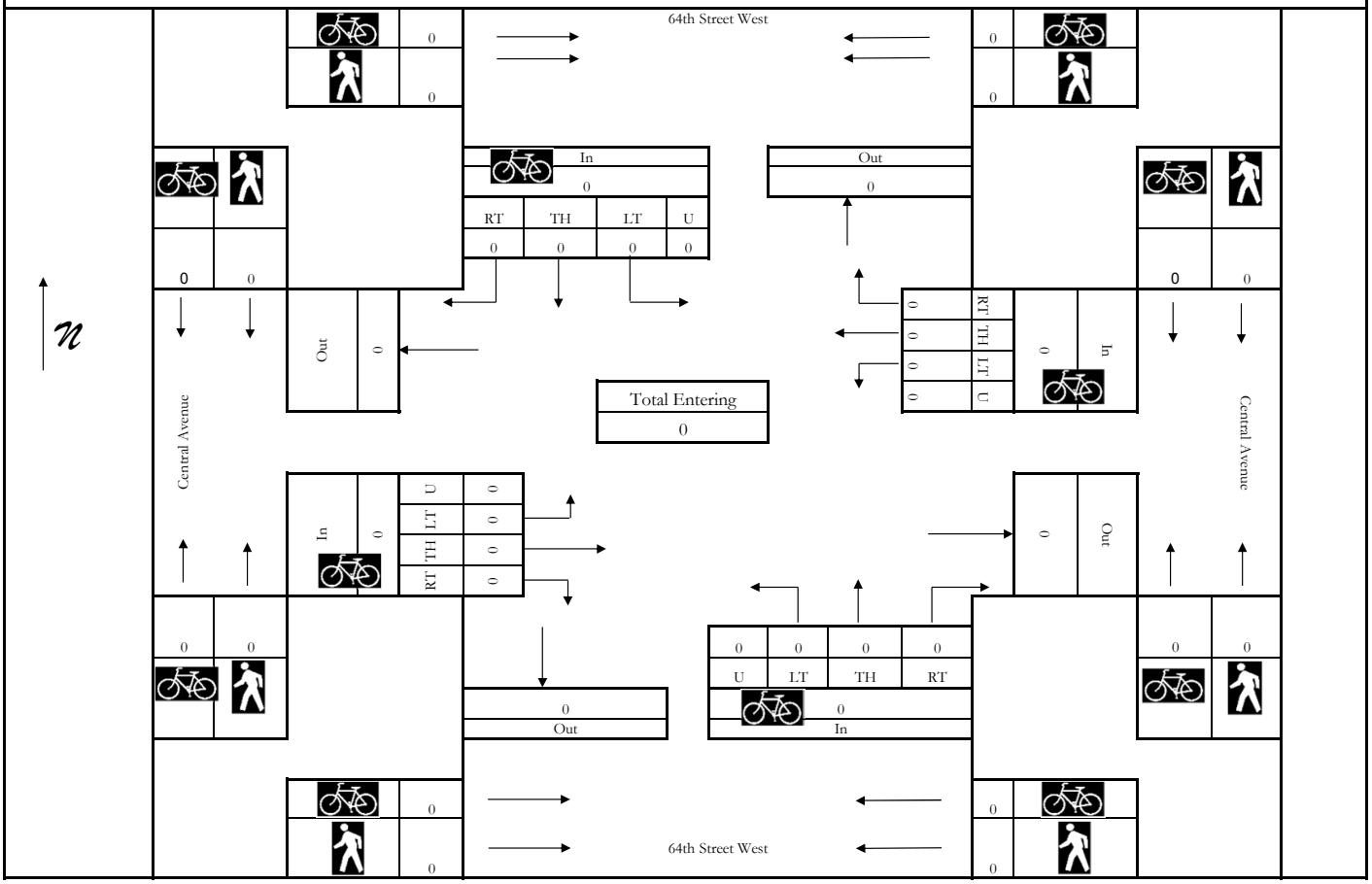
Counted By:	Rafael Teixeira	Intersection:	Central Avenue & 64th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64th Street West	East/West Street:	Central Avenue

Bikes in Roadway

	64th Street West Southbound					64th Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	64th Street West Southbound					64th Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

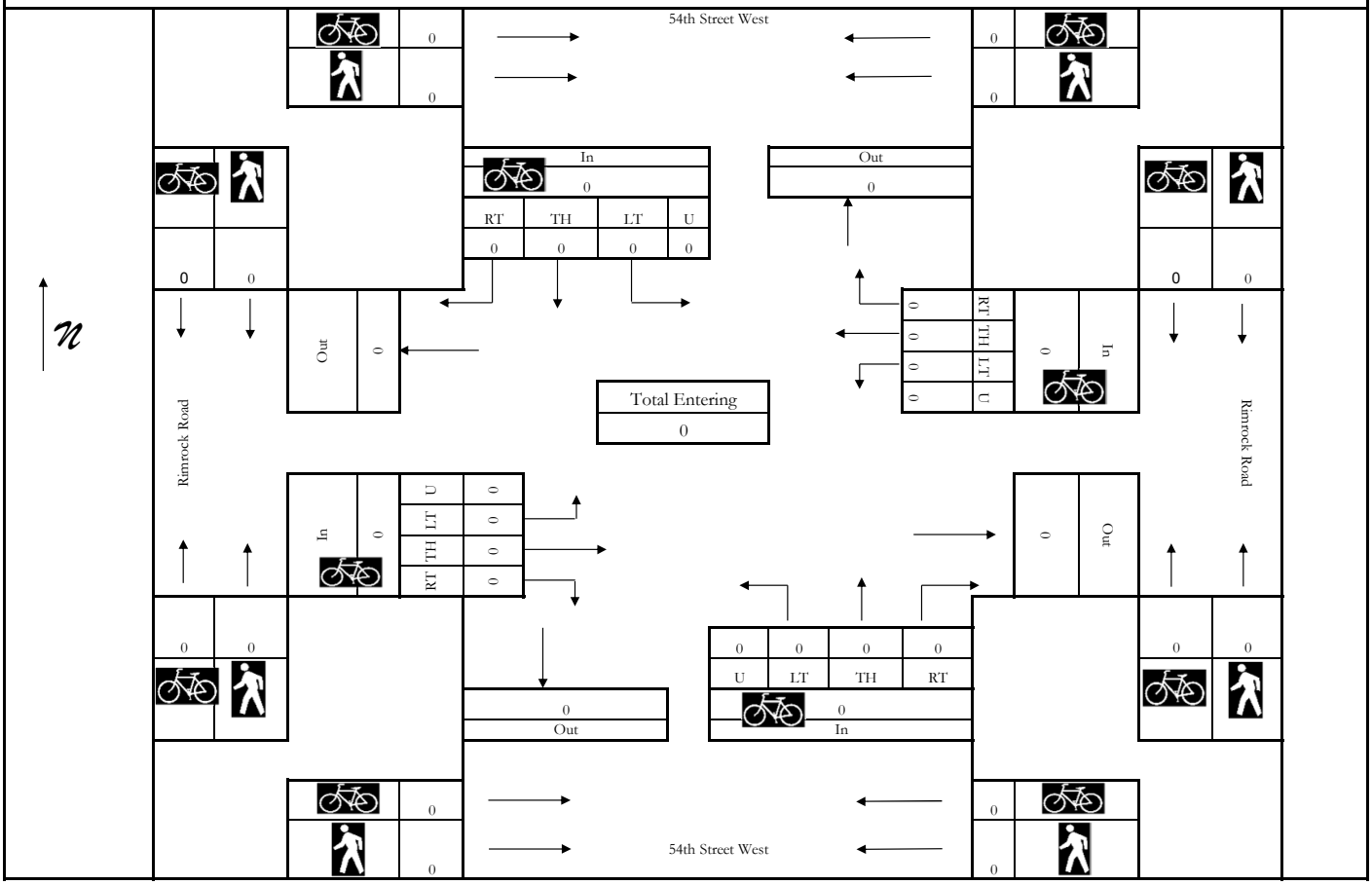
Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 54th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54th Street West	East/West Street:	Rimrock Road

Bikes in Roadway

	54th Street West Southbound					54th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	54th Street West Southbound					54th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

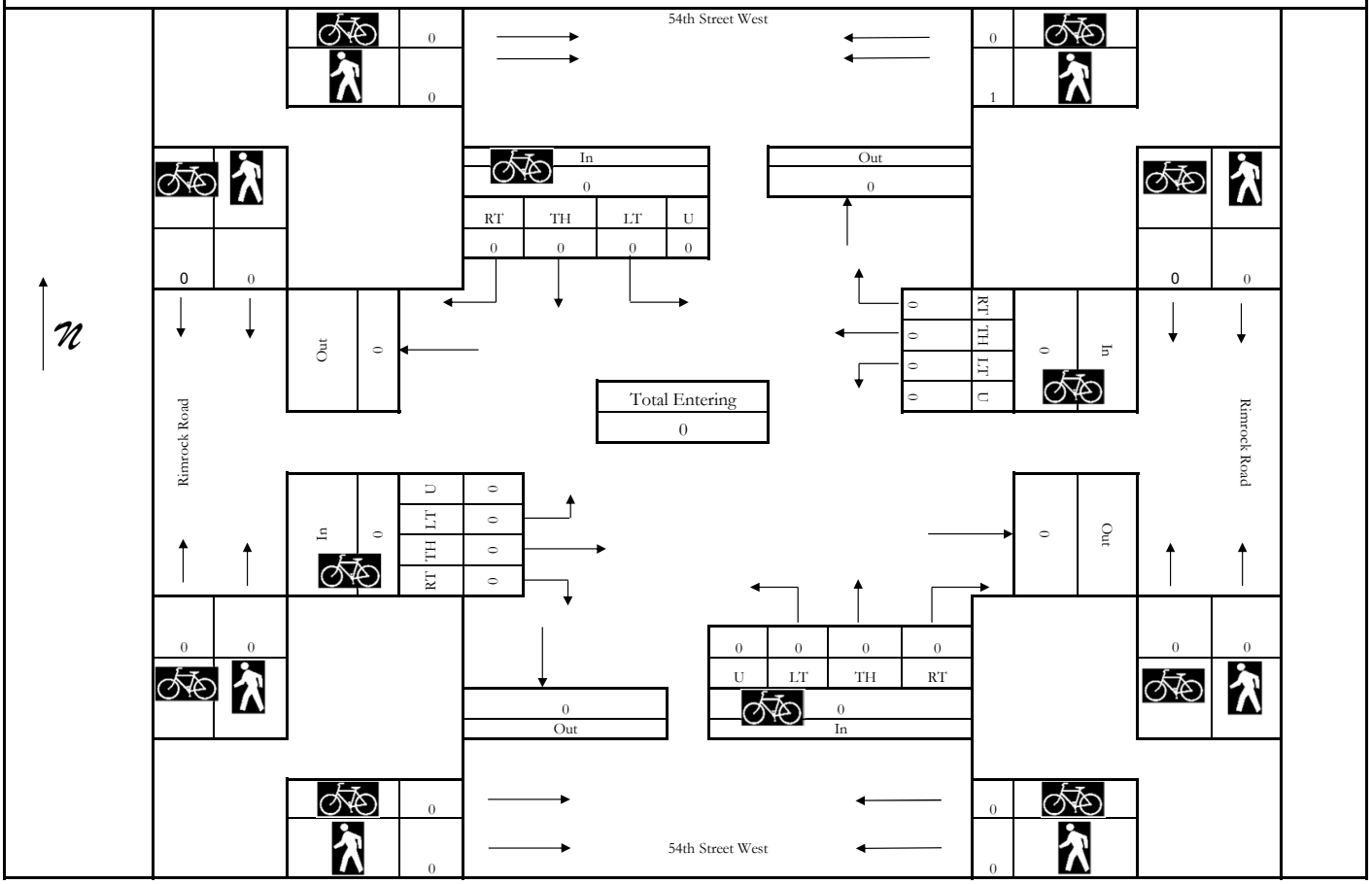
Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 54th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54th Street West	East/West Street:	Rimrock Road

Bikes in Roadway

	54th Street West Southbound					54th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	54th Street West Southbound					54th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

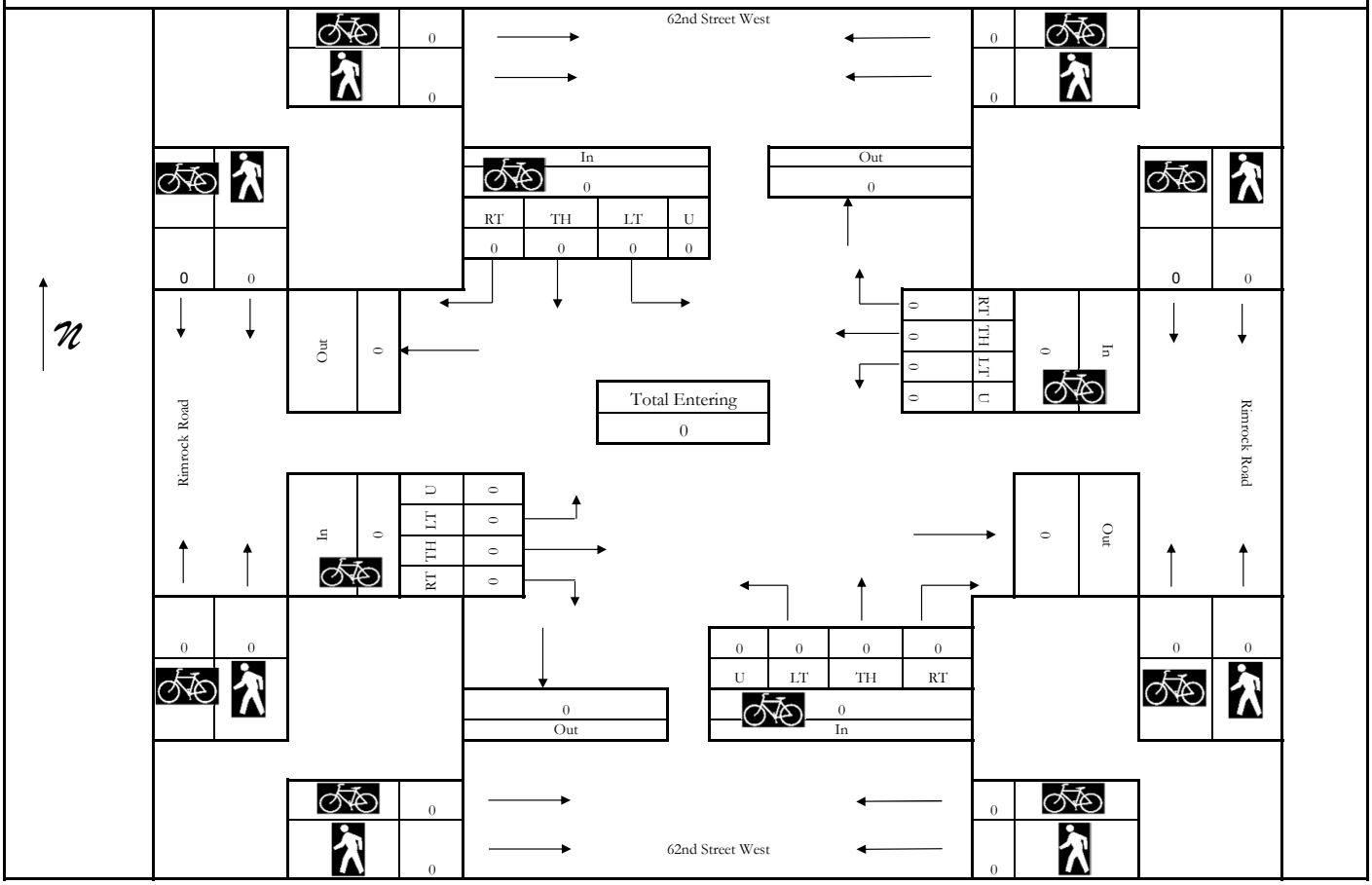
Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 62nd Street West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Bikes in Roadway

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

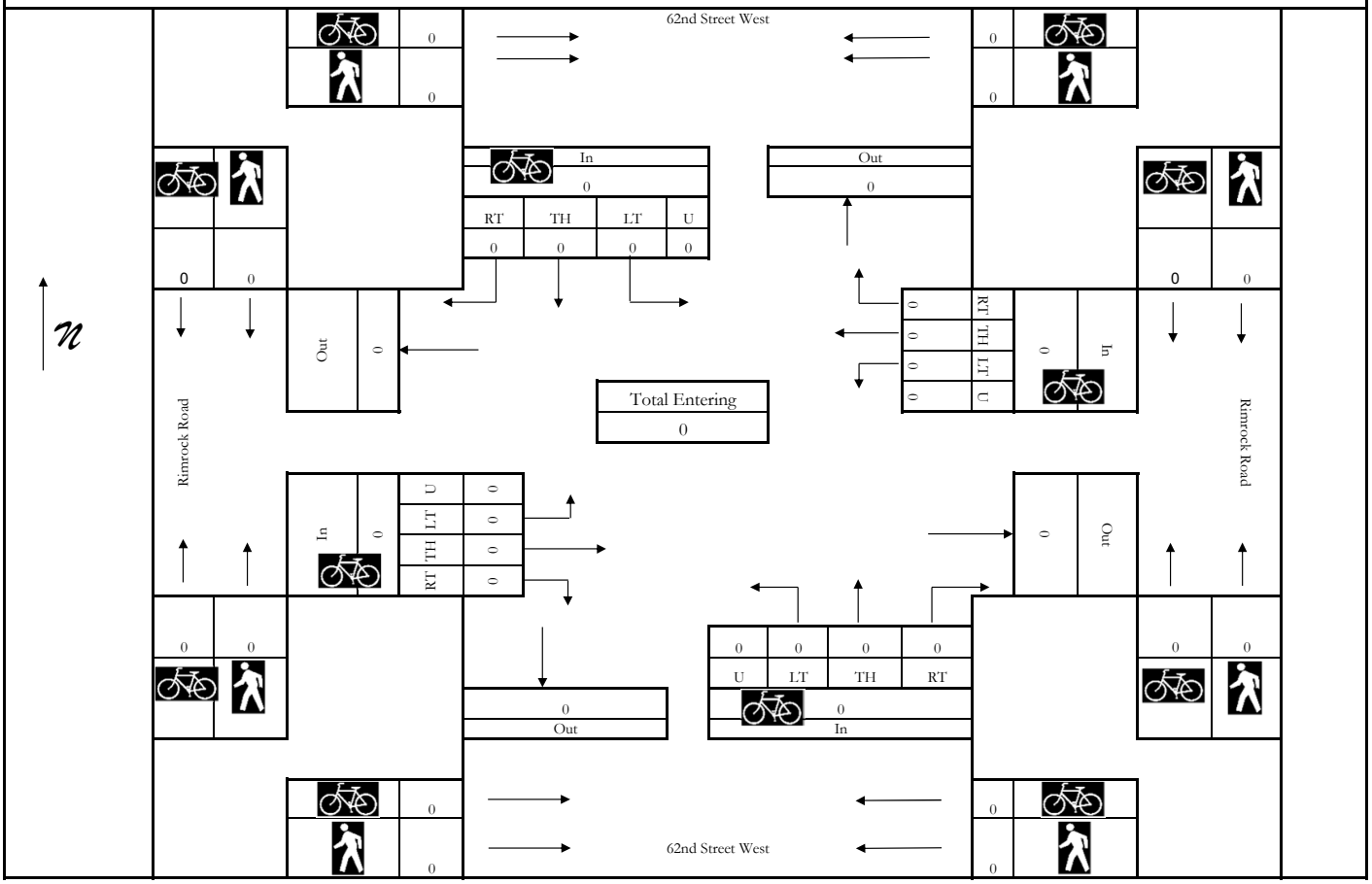
Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 62nd Street West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Bikes in Roadway

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

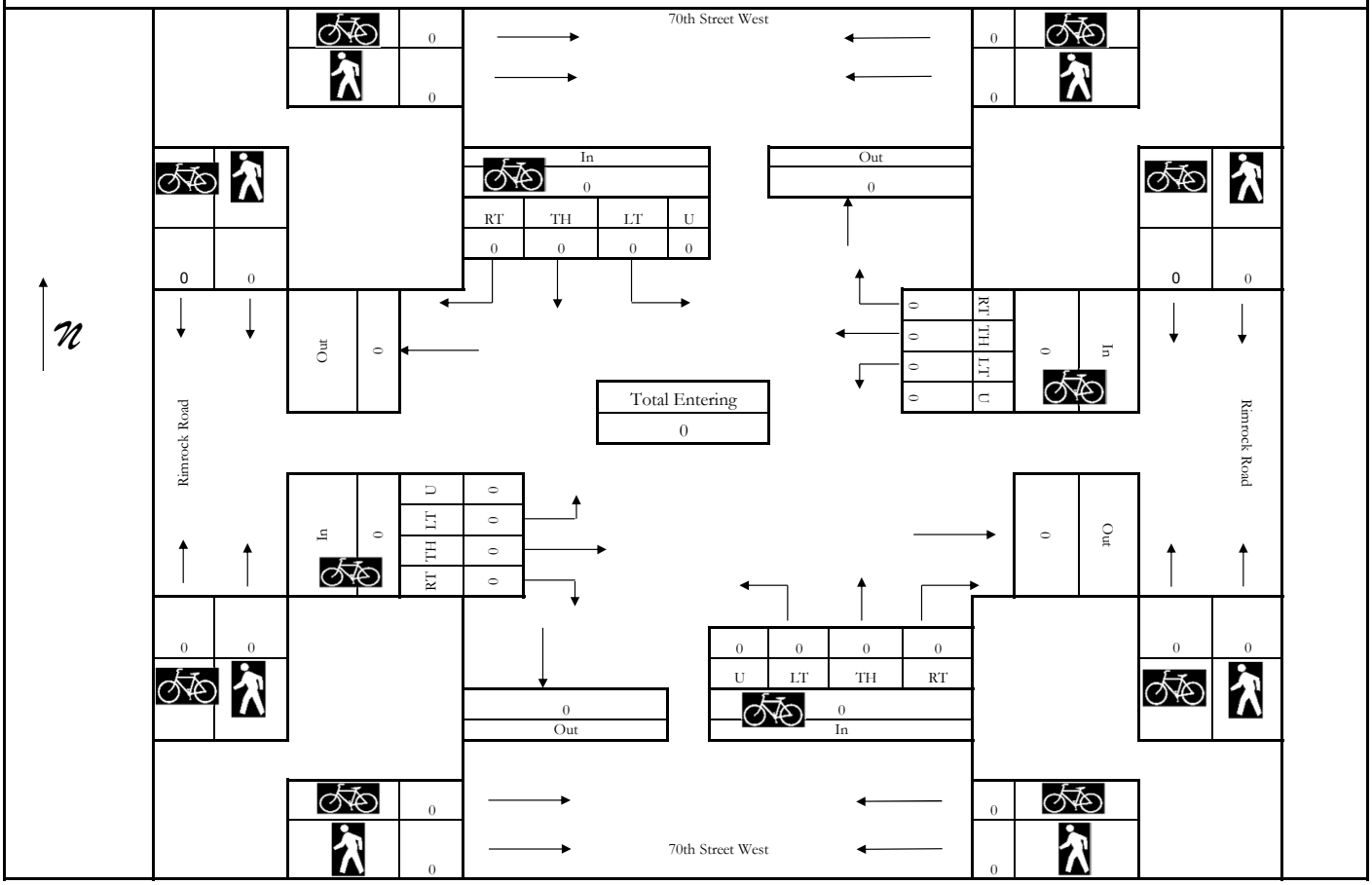
Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 70th Street West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	70th Street West	East/West Street:	Rimrock Road

Bikes in Roadway

	70th Street West Southbound					70th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	70th Street West Southbound					70th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

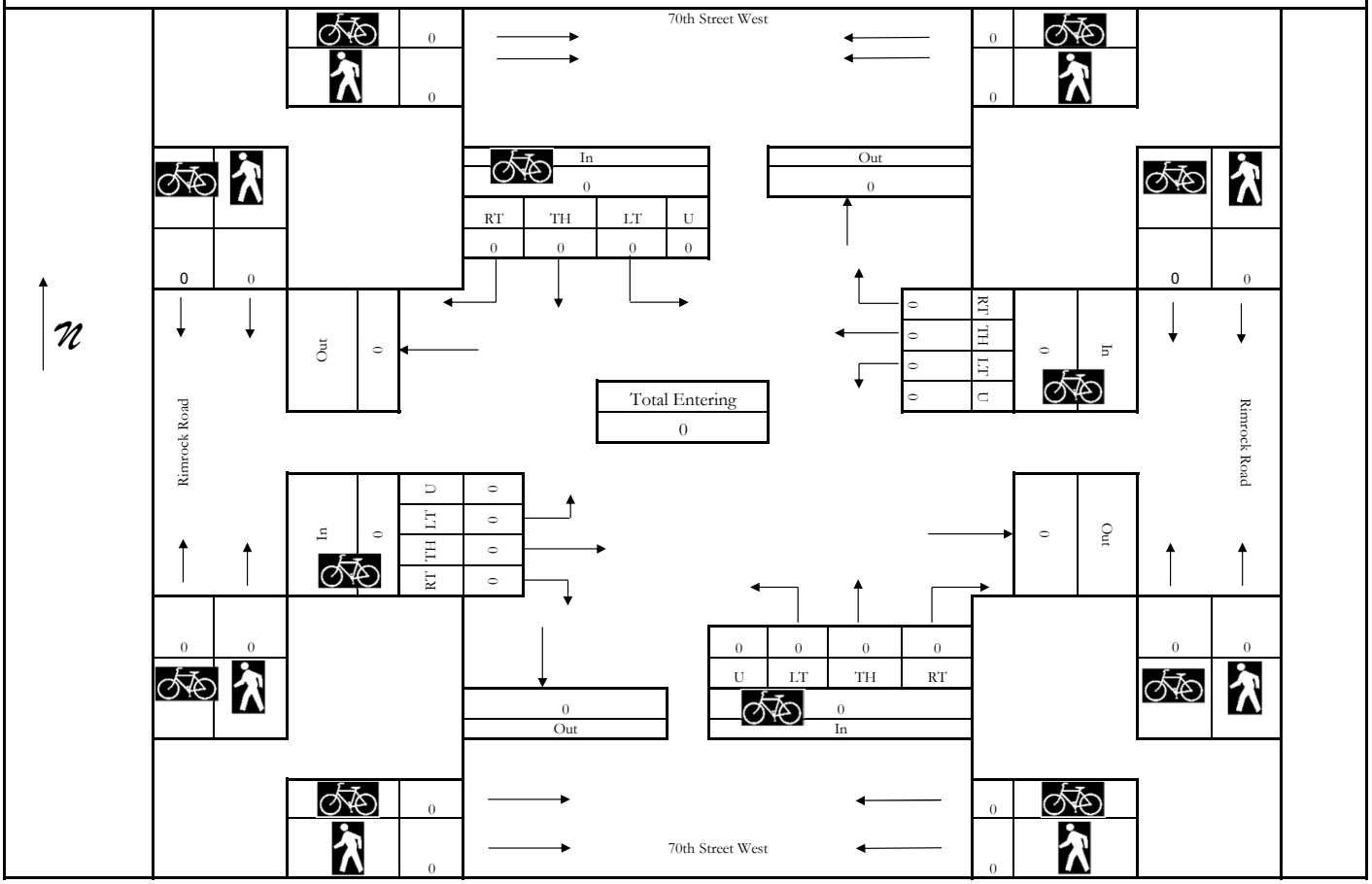
Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 70th Street West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	70th Street West	East/West Street:	Rimrock Road

Bikes in Roadway

	70th Street West Southbound					70th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	70th Street West Southbound					70th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

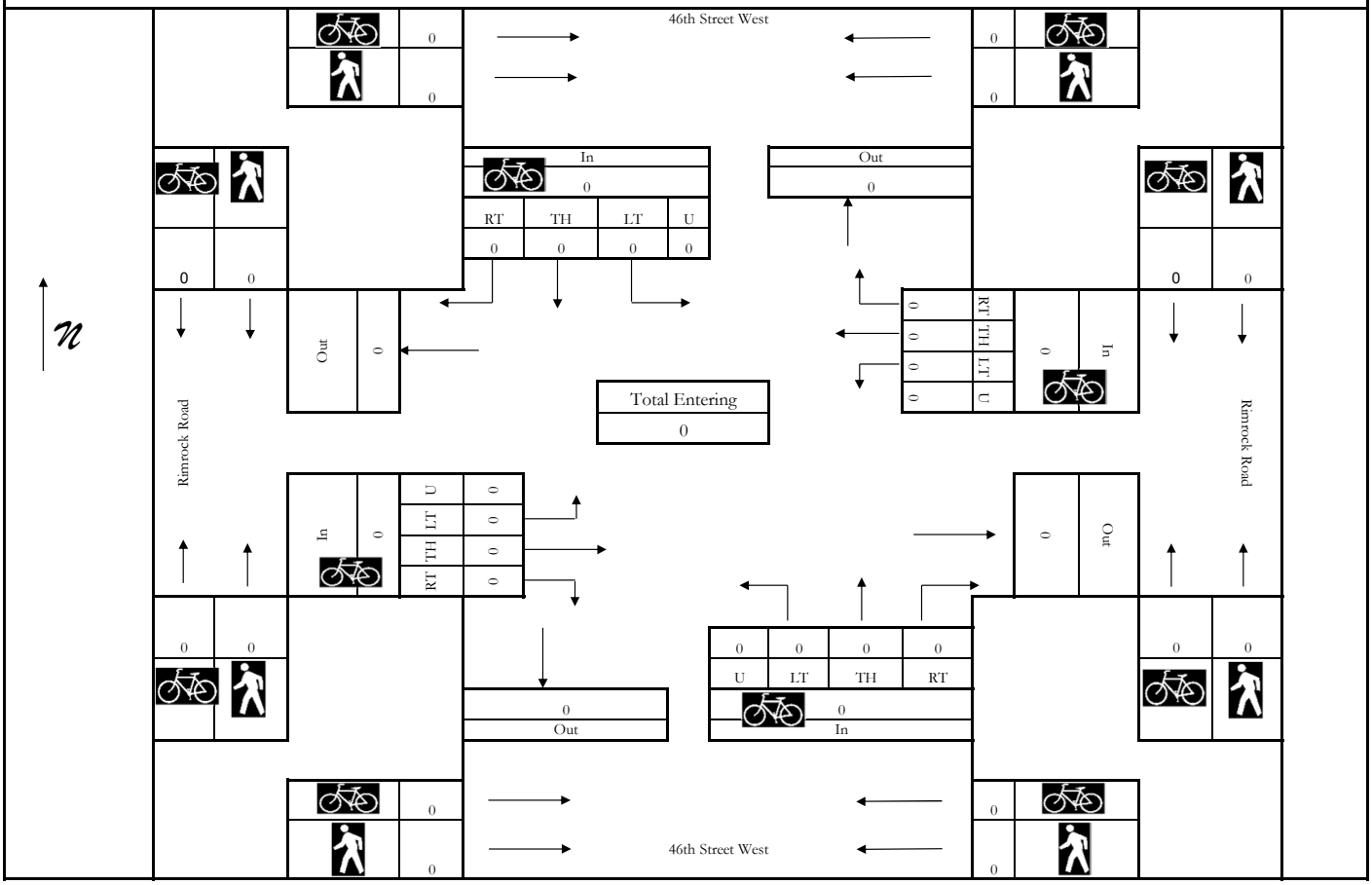
Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 46th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	46th Street West	East/West Street:	Rimrock Road

Bikes in Roadway

	46th Street West Southbound					46th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	46th Street West Southbound					46th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

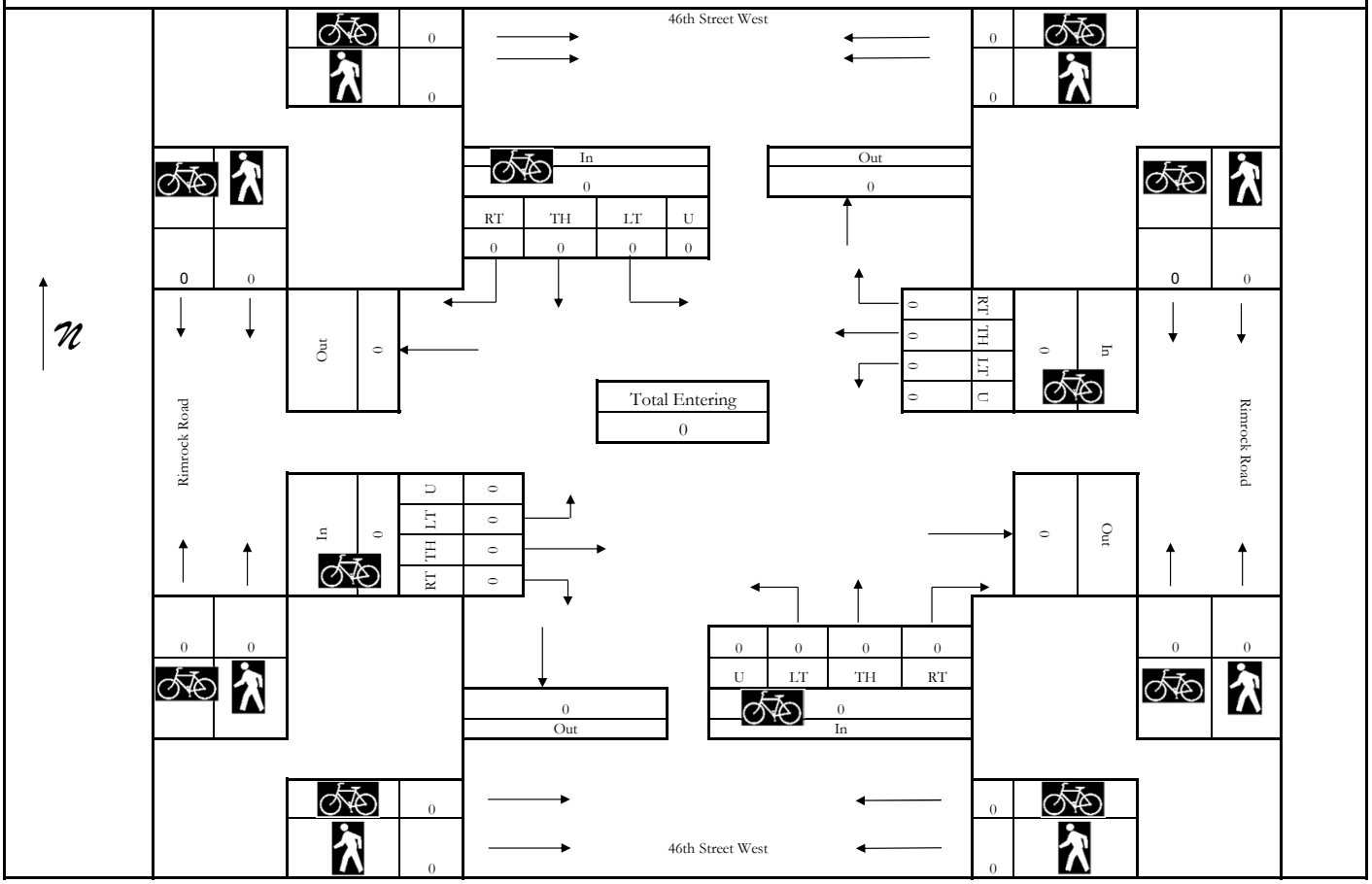
Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 46th Street West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	46th Street West	East/West Street:	Rimrock Road

Bikes in Roadway

	46th Street West Southbound					46th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bikes & Pedestrians in Crosswalk

	46th Street West Southbound					46th Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	CW Bike	CW Ped	CCW Bike	CCW Ped	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



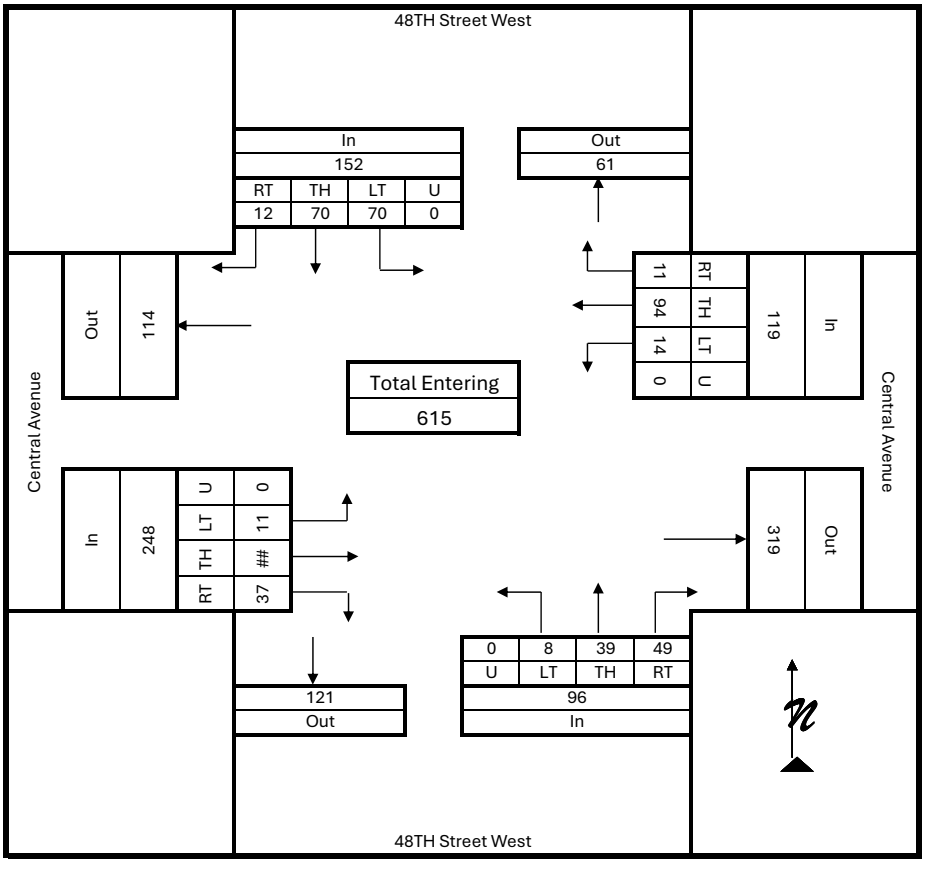
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Central Ave & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 8, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	Central Avenue

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		
7:15 AM	2	13	18	0	33	12	7	2	0	21	10	49	7	0	66	2	27	2	0	31	151
7:30 AM	3	13	19	0	35	18	9	2	0	29	5	61	1	0	67	3	26	2	0	31	162
7:45 AM	3	25	21	0	49	9	10	1	0	20	12	47	1	0	60	3	24	5	0	32	161
8:00 AM	4	19	12	0	35	10	13	3	0	26	10	43	2	0	55	3	17	5	0	25	141
Grand Total	12	70	70	0	152	49	39	8	0	96	37	200	11	0	248	11	94	14	0	119	615
Medium Truck %	0.0	0.0	0.0	0.0	0.0	2.0	5.1	12.5	0.0	4.2	2.7	0.5	0.0	0.0	0.8	18.2	2.1	0.0	0.0	3.4	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.8	
Total Truck %	0.0	0.0	0.0	0.0	0.0	2.0	5.1	12.5	0.0	4.2	2.7	0.5	0.0	0.0	0.8	18.2	3.2	0.0	0.0	4.2	
Total %	2.0	11.4	11.4	0.0	24.7	8.0	6.3	1.3	0.0	15.6	6.0	32.5	1.8	0.0	40.3	1.8	15.3	2.3	0.0	19.3	100.0
PHF	1.00	1.00	1.00			0.83	0.83	0.83			0.93	0.93	0.93			0.95	0.95	0.95			0.95



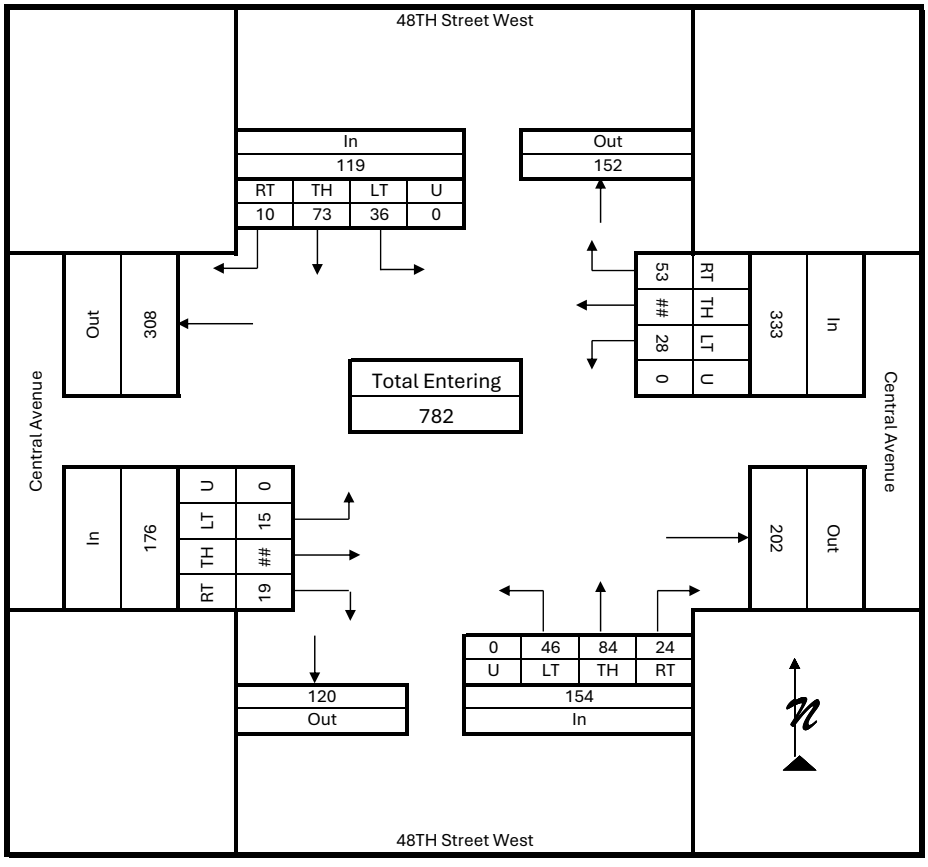
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Central Ave & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 8, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	Central Avenue

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		
4:45 PM	2	21	13	0	36	6	12	8	0	26	7	35	8	0	50	14	56	3	0	73	185
5:00 PM	1	15	6	0	22	7	23	9	0	39	5	37	1	0	43	14	69	7	0	90	194
5:15 PM	3	19	12	0	34	5	29	19	0	53	5	39	2	0	46	17	59	12	0	88	221
5:30 PM	4	18	5	0	27	6	20	10	0	36	2	31	4	0	37	8	68	6	0	82	182
Grand Total	10	73	36	0	119	24	84	46	0	154	19	142	15	0	176	53	252	28	0	333	782
Medium Truck %	0.0	1.4	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	5.3	2.1	0.0	0.0	2.3	3.8	0.0	0.0	0.0	0.6	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.4	0.0	0.0	0.3	
Total Truck %	0.0	1.4	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	5.3	2.8	0.0	0.0	2.8	3.8	0.4	0.0	0.0	0.9	
Total %	1.3	9.3	4.6	0.0	15.2	3.1	10.7	5.9	0.0	19.7	2.4	18.2	1.9	0.0	22.5	6.8	32.2	3.6	0.0	42.6	100.0
PHF	0.88	0.88	0.88			0.72	0.72	0.72			0.96	0.96	0.96			0.95	0.95	0.95			0.88



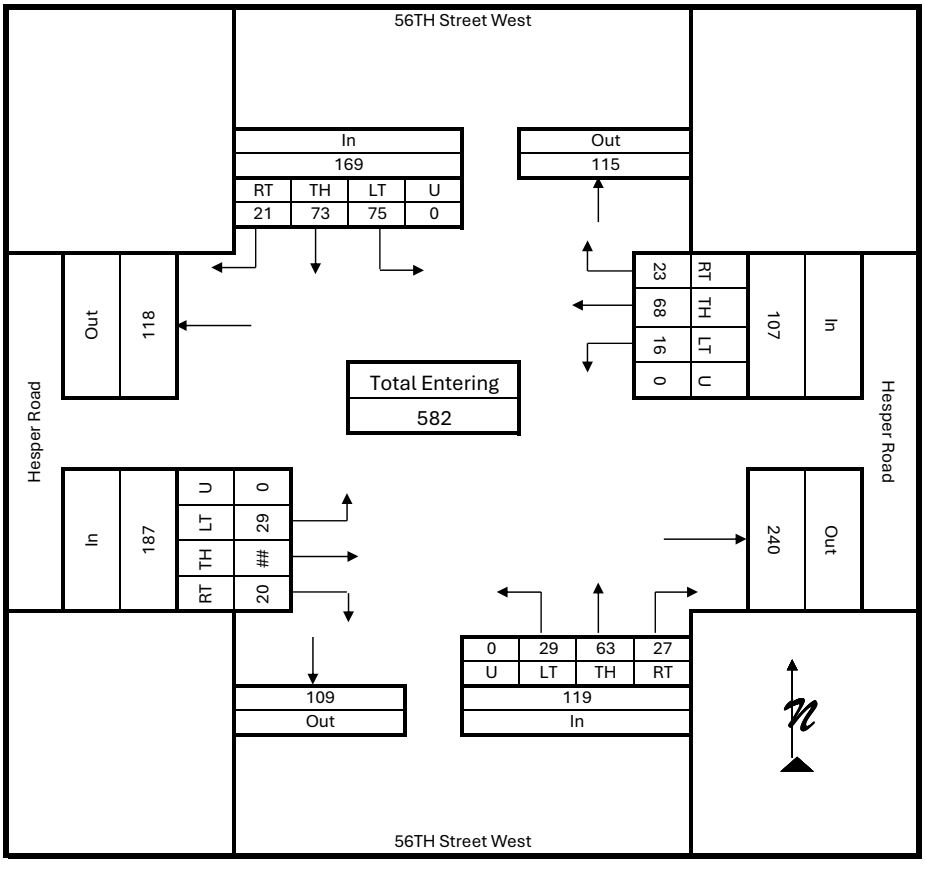
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Hesper RD & 56TH ST West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56TH Street West	East/West Street:	Hesper Road

Vehicle Volumes and Adjustments

	56TH Street West Southbound					56TH Street West Northbound					Hesper Road Eastbound					Hesper Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
7:15 AM	4	13	14	0	31	6	15	1	0	22	3	32	2	0	37	8	10	3	0	21	111
7:30 AM	7	23	19	0	49	13	18	8	0	39	2	19	4	0	25	4	19	3	0	26	139
7:45 AM	7	19	26	0	52	3	10	19	0	32	6	54	19	0	79	7	26	9	0	42	205
8:00 AM	3	18	16	0	37	5	20	1	0	26	9	33	4	0	46	4	13	1	0	18	127
Grand Total	21	73	75	0	169	27	63	29	0	119	20	138	29	0	187	23	68	16	0	107	582
Medium Truck %	0.0	0.0	0.0	0.0	0.0	3.7	0.0	3.4	0.0	1.7	0.0	5.8	0.0	0.0	4.3	8.7	1.5	0.0	0.0	2.8	
Heavy Truck %	0.0	6.8	0.0	0.0	3.0	3.7	1.6	0.0	0.0	1.7	0.0	0.7	0.0	0.0	0.5	8.7	2.9	12.5	0.0	5.6	
Total Truck %	0.0	6.8	0.0	0.0	3.0	7.4	1.6	3.4	0.0	3.4	0.0	6.5	0.0	0.0	4.8	17.4	4.4	12.5	0.0	8.4	
Total %	3.6	12.5	12.9	0.0	29.0	4.6	10.8	5.0	0.0	20.4	3.4	23.7	5.0	0.0	32.1	4.0	11.7	2.7	0.0	18.4	100.0
PHF	0.81	0.81	0.81			0.93	0.93	0.93			0.60	0.60	0.60			0.64	0.64	0.64			0.71



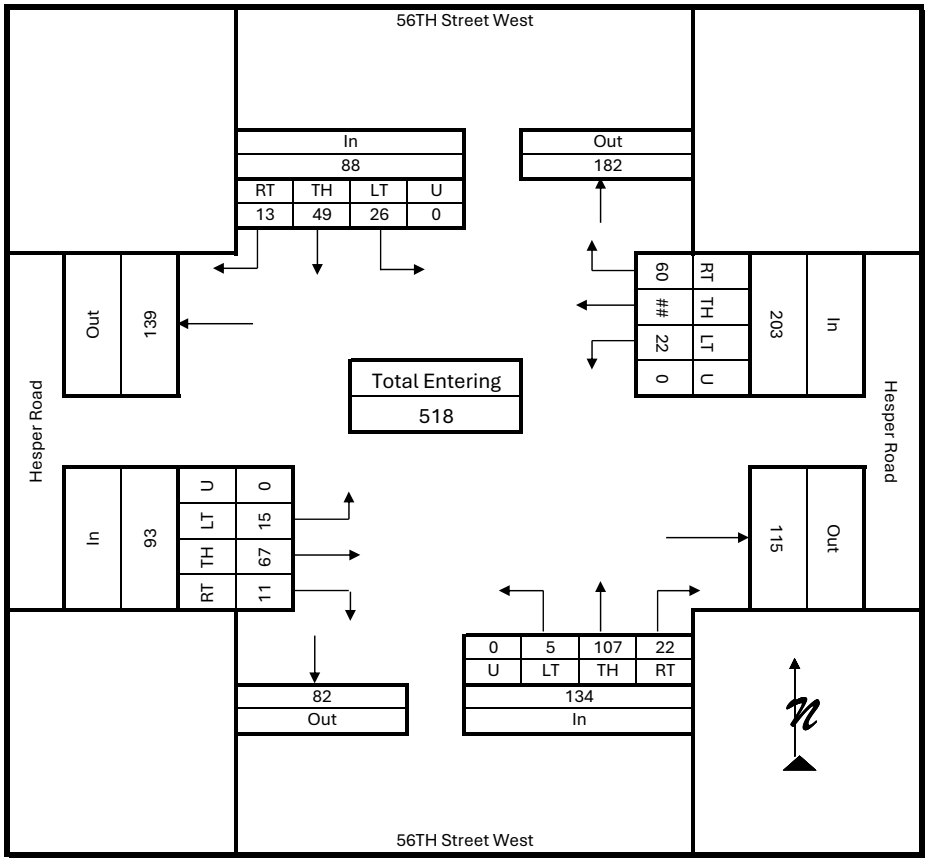
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Hesper RD & 56TH ST West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56TH Street West	East/West Street:	Hesper Road

Vehicle Volumes and Adjustments

	56TH Street West Southbound					56TH Street West Northbound					Hesper Road Eastbound					Hesper Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
4:45 PM	5	9	8	0	22	4	19	2	0	25	1	18	4	0	23	11	33	6	0	50	120
5:00 PM	2	15	9	0	26	10	38	3	0	51	6	23	4	0	33	18	38	8	0	64	174
5:15 PM	5	16	4	0	25	6	21	0	0	27	3	14	5	0	22	21	27	2	0	50	124
5:30 PM	1	9	5	0	15	2	29	0	0	31	1	12	2	0	15	10	23	6	0	39	100
Grand Total	13	49	26	0	88	22	107	5	0	134	11	67	15	0	93	60	121	22	0	203	518
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	2.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	9.1	3.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	2.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	9.1	3.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	
Total %	2.5	9.5	5.0	0.0	17.0	4.2	20.7	1.0	0.0	25.9	2.1	12.9	2.9	0.0	18.0	11.6	23.4	4.2	0.0	39.2	100.0
PHF	0.85	0.85	0.85			0.66	0.66	0.66			0.70	0.70	0.70			0.79	0.79	0.79			0.74



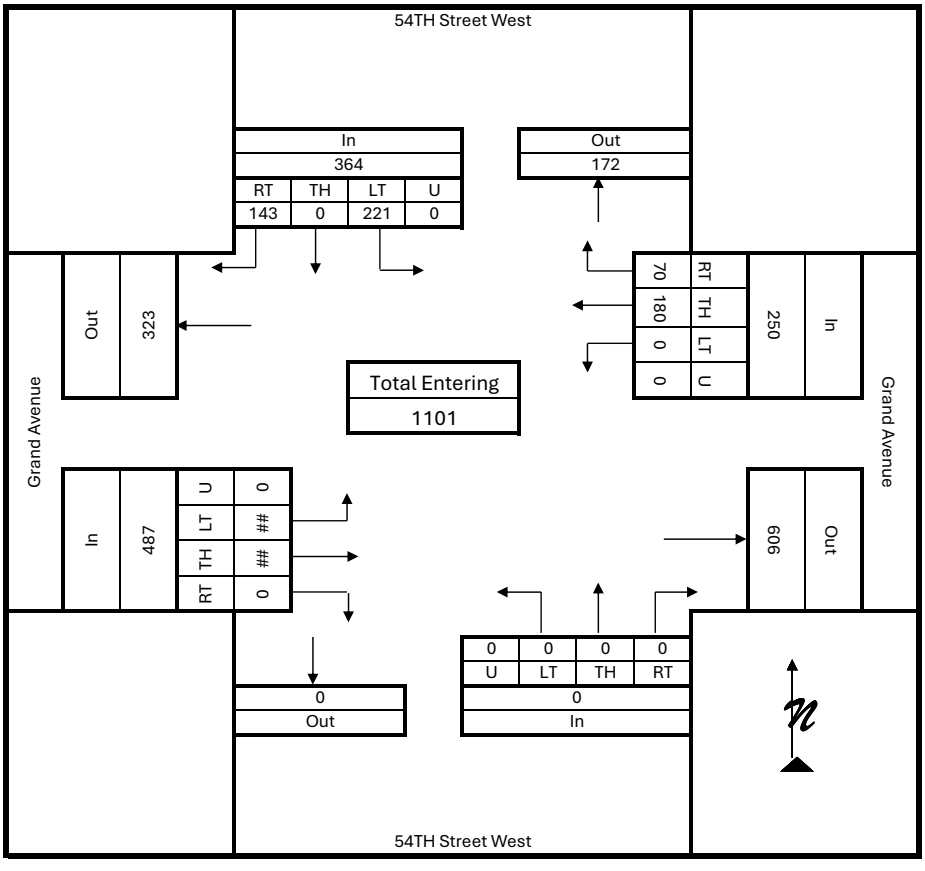
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Grand Ave & 54TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54TH Street West	East/West Street:	Grand Avenue

Vehicle Volumes and Adjustments

	54TH Street West Southbound					54TH Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	19	0	56	0	75	0	0	0	0	0	0	66	7	0	73	9	31	0	0	40	188
7:30 AM	52	0	66	0	118	0	0	0	0	0	0	104	23	0	127	8	46	0	0	54	299
7:45 AM	51	0	54	0	105	0	0	0	0	0	0	133	43	0	176	22	52	0	0	74	355
8:00 AM	21	0	45	0	66	0	0	0	0	0	0	82	29	0	111	31	51	0	0	82	259
Grand Total	143	0	221	0	364	0	0	0	0	0	0	385	102	0	487	70	180	0	0	250	1101
Medium Truck %	0.0	0.0	0.5	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0	3.3	0.0	0.0	2.4	
Heavy Truck %	0.7	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.2	2.9	2.8	0.0	0.0	2.8	
Total Truck %	0.7	0.0	0.9	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.0	0.0	1.2	2.9	6.1	0.0	0.0	5.2	
Total %	13.0	0.0	20.1	0.0	33.1	0.0	0.0	0.0	0.0	0.0	0.0	35.0	9.3	0.0	44.2	6.4	16.3	0.0	0.0	22.7	100.0
PHF	0.86	0.86	0.86			1.00	1.00	1.00			0.69	0.69	0.69			0.85	0.85	0.85			0.78



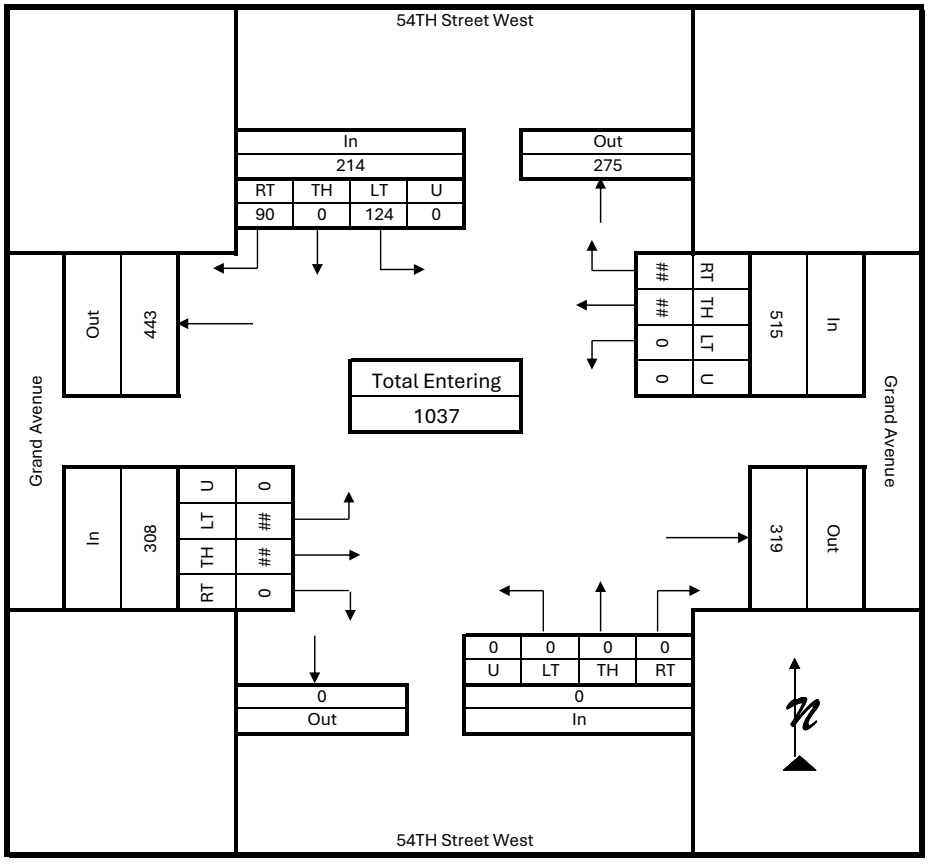
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Grand Ave & 54TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54TH Street West	East/West Street:	Grand Avenue

Vehicle Volumes and Adjustments

	54TH Street West Southbound					54TH Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	20	0	25	0	45	0	0	0	0	0	0	44	28	0	72	27	70	0	0	97	214
5:00 PM	28	0	45	0	73	0	0	0	0	0	0	58	29	0	87	35	80	0	0	115	275
5:15 PM	23	0	26	0	49	0	0	0	0	0	0	51	32	0	83	64	95	0	0	159	291
5:30 PM	19	0	28	0	47	0	0	0	0	0	0	42	24	0	66	36	108	0	0	144	257
Grand Total	90	0	124	0	214	0	0	0	0	0	0	195	113	0	308	162	353	0	0	515	1037
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.2	
Heavy Truck %	0.0	0.0	0.8	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.8	0.0	1.0	0.6	0.0	0.0	0.0	0.2	
Total Truck %	0.0	0.0	0.8	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.8	0.0	1.0	1.2	0.0	0.0	0.0	0.4	
Total %	8.7	0.0	12.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	0.0	18.8	10.9	0.0	29.7	15.6	34.0	0.0	0.0	49.7	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			0.93	0.93	0.93			0.81	0.81	0.81			0.89



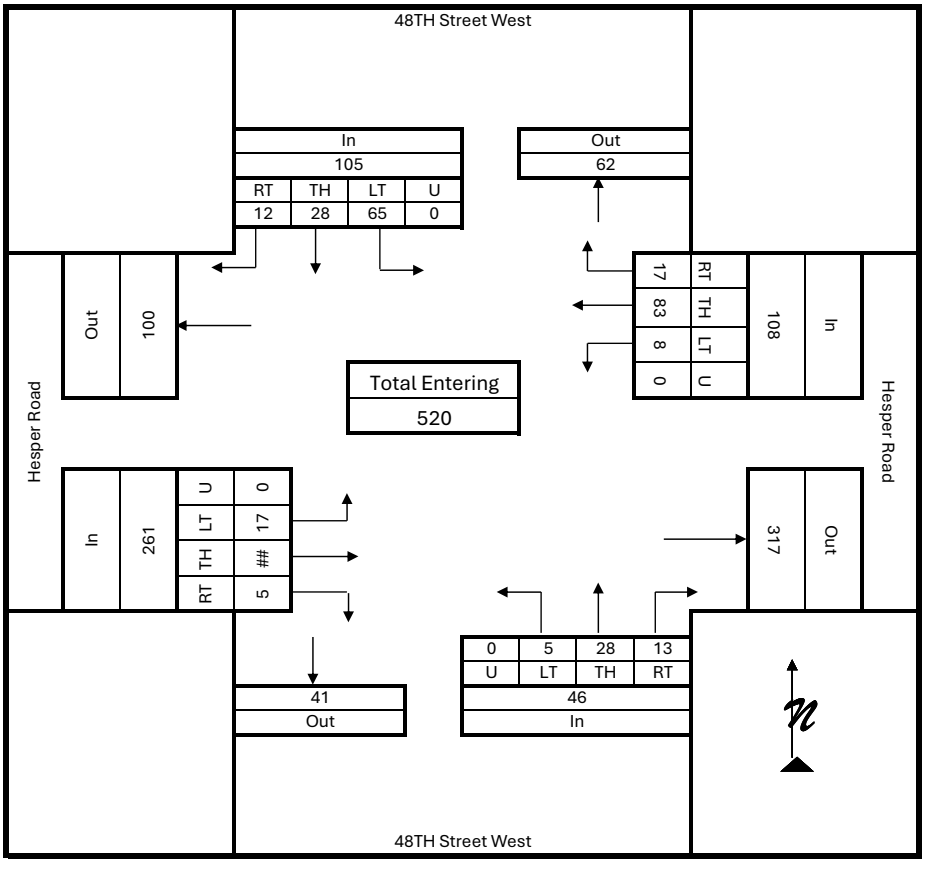
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Hesper Road & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	Hesper Road

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					Hesper Road Eastbound					Hesper Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		
7:15 AM	2	8	15	0	25	2	4	1	0	7	1	49	2	0	52	5	18	1	0	24	108
7:30 AM	3	3	8	0	14	5	10	3	0	18	0	65	4	0	69	4	21	2	0	27	128
7:45 AM	6	9	22	0	37	3	7	1	0	11	0	67	4	0	71	5	26	2	0	33	152
8:00 AM	1	8	20	0	29	3	7	0	0	10	4	58	7	0	69	3	18	3	0	24	132
Grand Total	12	28	65	0	105	13	28	5	0	46	5	239	17	0	261	17	83	8	0	108	520
Medium Truck %	8.3	3.6	0.0	0.0	1.9	0.0	0.0	20.0	0.0	2.2	0.0	3.3	5.9	0.0	3.4	0.0	2.4	0.0	0.0	1.9	
Heavy Truck %	0.0	0.0	1.5	0.0	1.0	7.7	3.6	0.0	0.0	4.3	0.0	2.1	0.0	0.0	1.9	5.9	7.2	0.0	0.0	6.5	
Total Truck %	8.3	3.6	1.5	0.0	2.9	7.7	3.6	20.0	0.0	6.5	0.0	5.4	5.9	0.0	5.4	5.9	9.6	0.0	0.0	8.3	
Total %	2.3	5.4	12.5	0.0	20.2	2.5	5.4	1.0	0.0	8.8	1.0	46.0	3.3	0.0	50.2	3.3	16.0	1.5	0.0	20.8	100.0
PHF	0.71	0.71	0.71			1.00	1.00	1.00			0.92	0.92	0.92			0.82	0.82	0.82			0.86



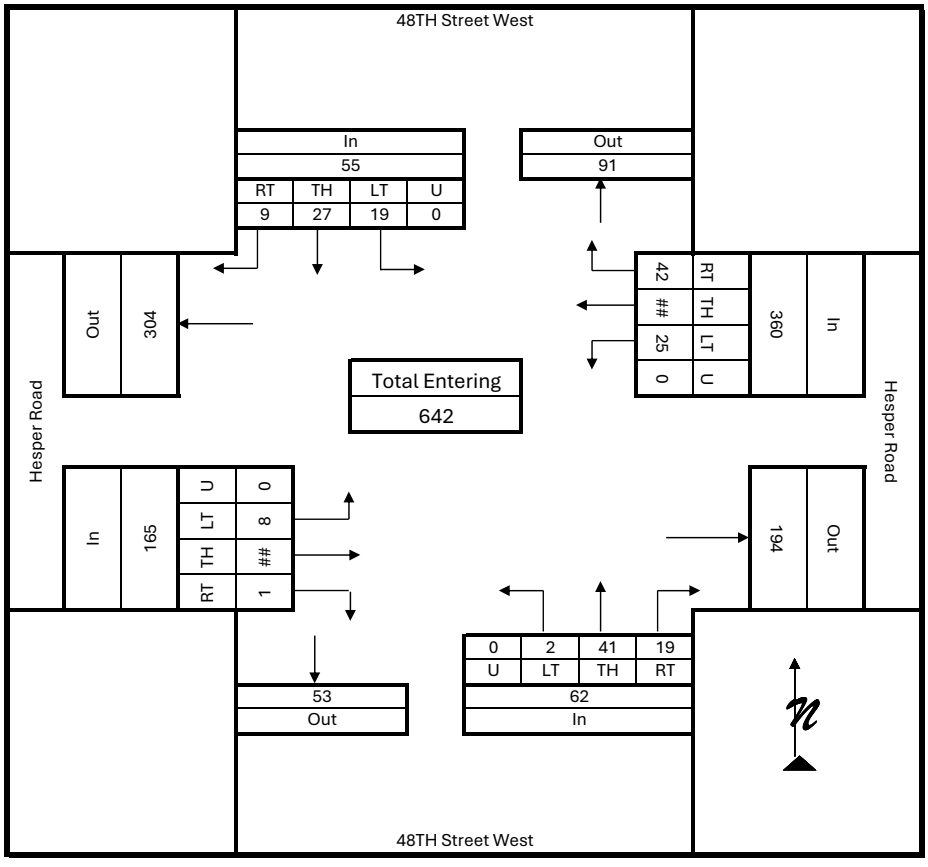
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Hesper Road & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	Hesper Road

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					Hesper Road Eastbound					Hesper Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		
4:45 PM	1	6	4	0	11	2	7	0	0	9	0	43	2	0	45	11	67	4	0	82	147
5:00 PM	4	4	5	0	13	8	18	1	0	27	0	29	2	0	31	17	75	6	0	98	169
5:15 PM	3	10	7	0	20	4	6	1	0	11	0	48	3	0	51	8	85	9	0	102	184
5:30 PM	1	7	3	0	11	5	10	0	0	15	1	36	1	0	38	6	66	6	0	78	142
Grand Total	9	27	19	0	55	19	41	2	0	62	1	156	8	0	165	42	293	25	0	360	642
Medium Truck %	0.0	0.0	5.3	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	12.5	0.0	1.2	0.0	0.7	0.0	0.0	0.6	
Total Truck %	0.0	0.0	5.3	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	1.9	12.5	0.0	2.4	0.0	0.7	0.0	0.0	0.6	
Total %	1.4	4.2	3.0	0.0	8.6	3.0	6.4	0.3	0.0	9.7	0.2	24.3	1.2	0.0	25.7	6.5	45.6	3.9	0.0	56.1	100.0
PHF	0.67	0.67	0.67			1.00	1.00	1.00			0.81	0.81	0.81			0.89	0.89	0.89			0.87



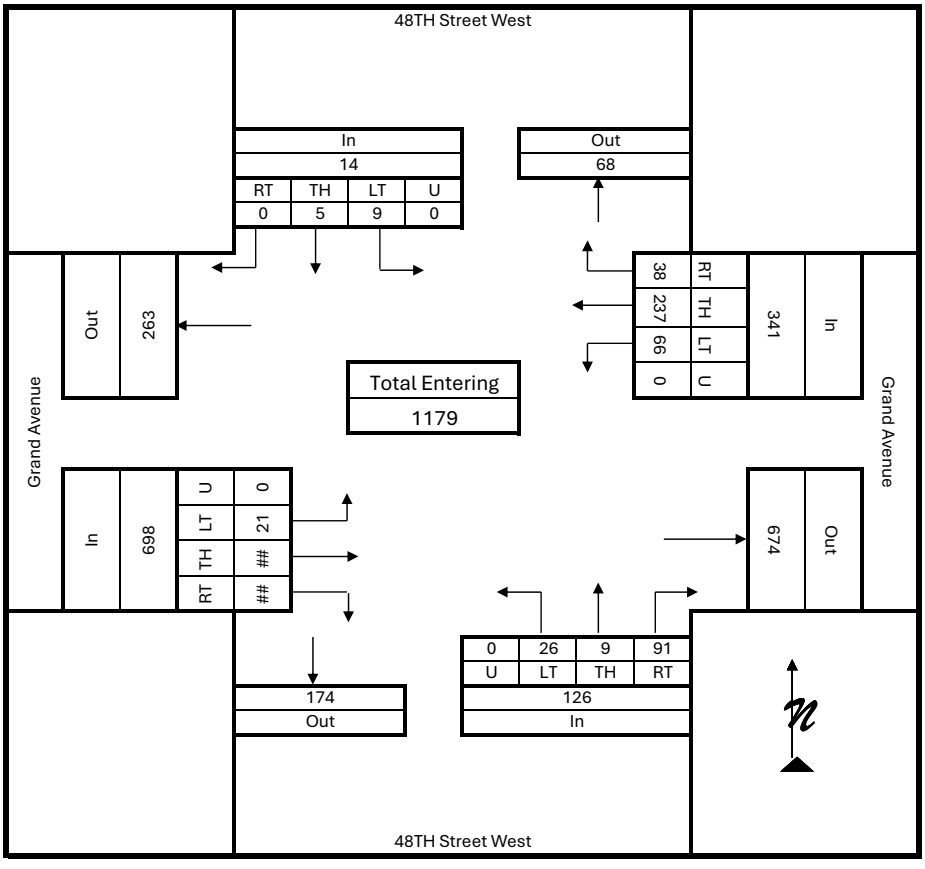
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Grand Ave & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	Grand Avenue

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	0	0	0	0	22	0	4	0	26	16	126	0	0	142	1	37	9	0	47	215
7:30 AM	0	1	1	0	2	25	2	7	0	34	28	159	0	0	187	1	46	6	0	53	276
7:45 AM	0	1	1	0	2	32	2	12	0	46	35	162	0	0	197	6	71	14	0	91	336
8:00 AM	0	3	7	0	10	12	5	3	0	20	24	127	21	0	172	30	83	37	0	150	352
Grand Total	0	5	9	0	14	91	9	26	0	126	103	574	21	0	698	38	237	66	0	341	1179
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0	1.6	1.0	0.7	0.0	0.0	0.7	0.0	1.7	1.5	0.0	1.5	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0	1.6	0.0	0.5	0.0	0.0	0.4	0.0	2.1	0.0	0.0	1.5	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.4	0.0	3.2	1.0	1.2	0.0	0.0	1.1	0.0	3.8	1.5	0.0	2.9	
Total %	0.0	0.4	0.8	0.0	1.2	7.7	0.8	2.2	0.0	10.7	8.7	48.7	1.8	0.0	59.2	3.2	20.1	5.6	0.0	28.9	100.0
PHF	0.35	0.35	0.35			1.00	1.00	1.00			1.00	1.00	1.00			0.57	0.57	0.57			0.84



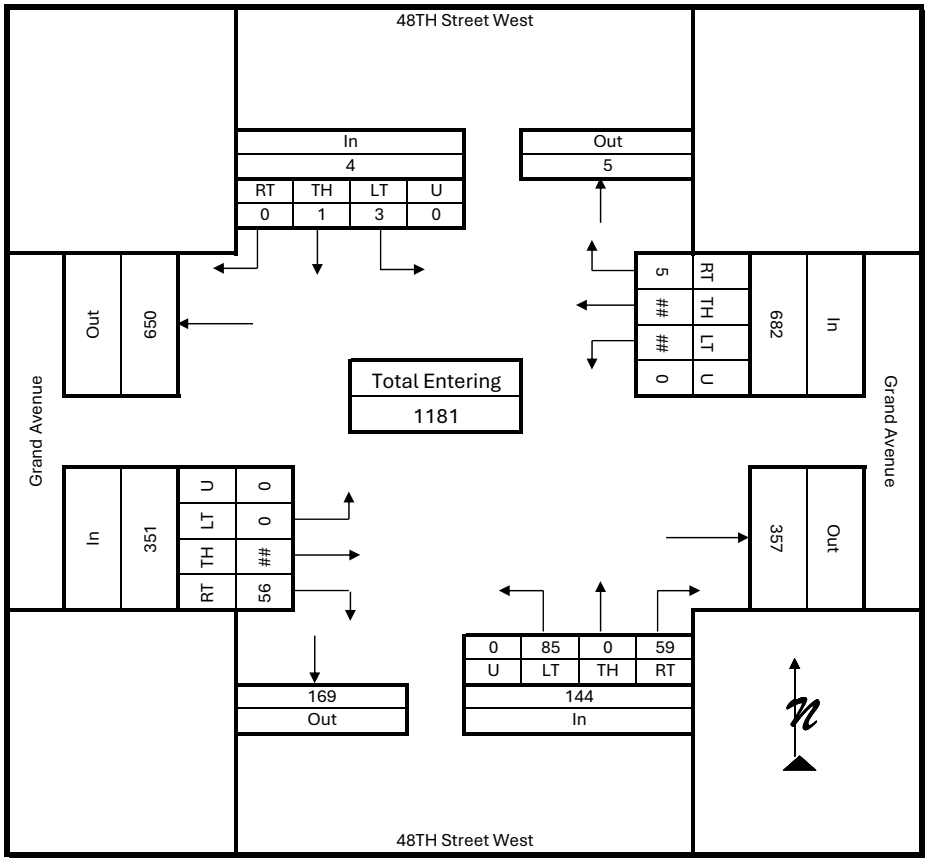
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Grand Ave & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	Grand Avenue

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	0	0	3	0	3	12	0	8	0	20	9	74	0	0	83	3	118	22	0	143	249
5:00 PM	0	1	0	0	1	14	0	30	0	44	16	88	0	0	104	1	129	29	0	159	308
5:15 PM	0	0	0	0	0	7	0	23	0	30	21	72	0	0	93	1	177	37	0	215	338
5:30 PM	0	0	0	0	0	26	0	24	0	50	10	61	0	0	71	0	141	24	0	165	286
Grand Total	0	1	3	0	4	59	0	85	0	144	56	295	0	0	351	5	565	112	0	682	1181
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.7	0.0	0.7	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.7	0.0	0.7	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	0.1	0.3	0.0	0.3	5.0	0.0	7.2	0.0	12.2	4.7	25.0	0.0	0.0	29.7	0.4	47.8	9.5	0.0	57.7	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			0.95	0.95	0.95			0.79	0.79	0.79			0.87



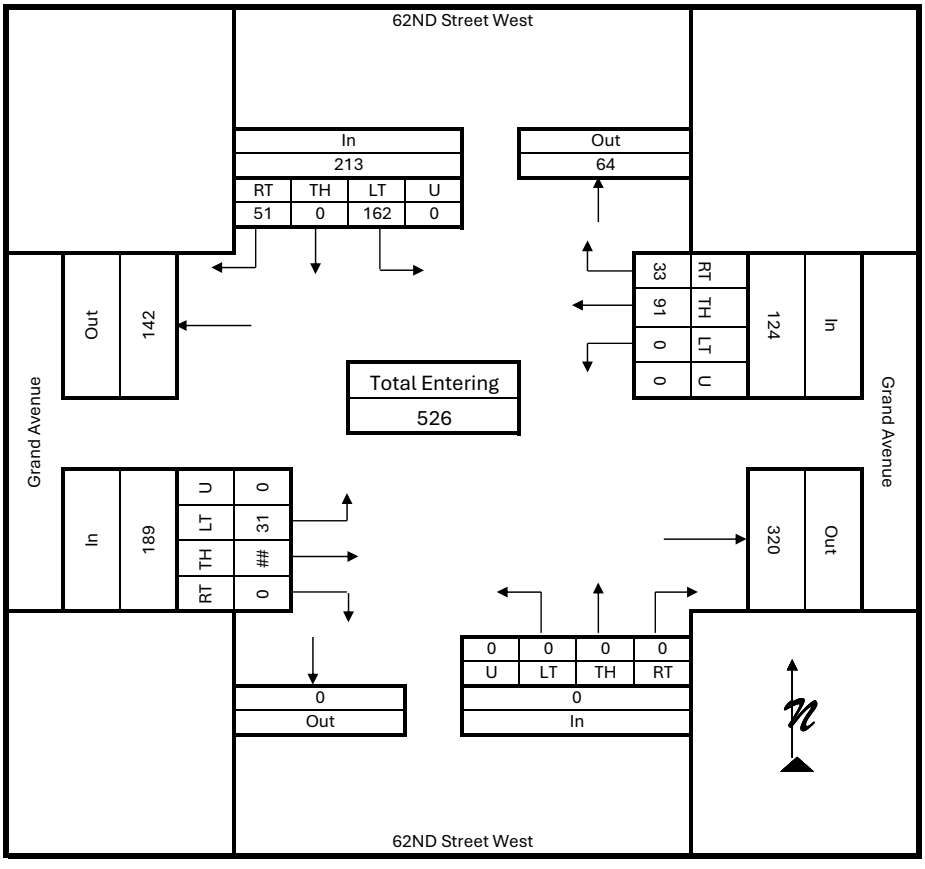
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Grand Ave & 62ND ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62ND Street West	East/West Street:	Grand Avenue

Vehicle Volumes and Adjustments

	62ND Street West Southbound					62ND Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	7	0	33	0	40	0	0	0	0	0	0	33	8	0	41	3	20	0	0	23	104
7:30 AM	10	0	48	0	58	0	0	0	0	0	0	47	7	0	54	6	15	0	0	21	133
7:45 AM	23	0	50	0	73	0	0	0	0	0	0	47	9	0	56	10	25	0	0	35	164
8:00 AM	11	0	31	0	42	0	0	0	0	0	0	31	7	0	38	14	31	0	0	45	125
Grand Total	51	0	162	0	213	0	0	0	0	0	0	158	31	0	189	33	91	0	0	124	526
Medium Truck %	0.0	0.0	0.6	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.1	6.1	3.3	0.0	0.0	4.0	
Heavy Truck %	0.0	0.0	0.6	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	3.3	0.0	0.0	4.0	
Total Truck %	0.0	0.0	1.2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.1	12.1	6.6	0.0	0.0	8.1	
Total %	9.7	0.0	30.8	0.0	40.5	0.0	0.0	0.0	0.0	0.0	0.0	30.0	5.9	0.0	35.9	6.3	17.3	0.0	0.0	23.6	100.0
PHF	0.74	0.74	0.74			1.00	1.00	1.00			0.85	0.85	0.85			0.88	0.88	0.88			0.80



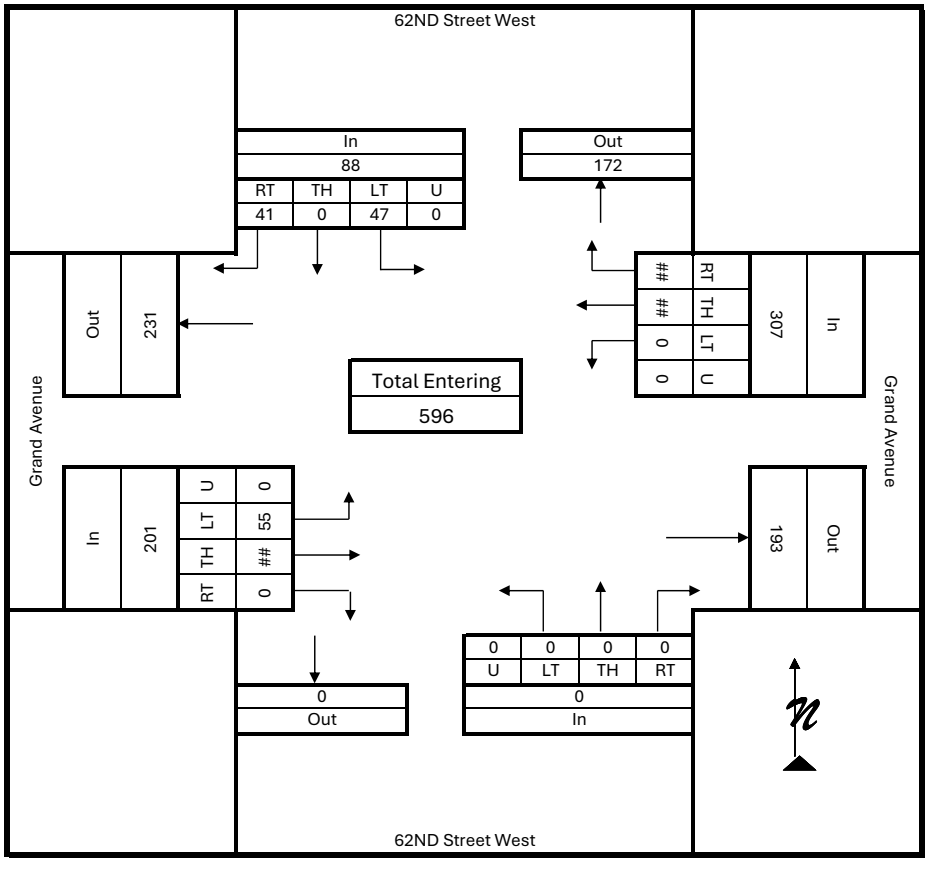
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Grand Ave & 62ND ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62ND Street West	East/West Street:	Grand Avenue

Vehicle Volumes and Adjustments

	62ND Street West Southbound					62ND Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	10	0	14	0	24	0	0	0	0	0	0	31	15	0	46	22	36	0	0	58	128
5:00 PM	7	0	7	0	14	0	0	0	0	0	0	42	15	0	57	23	49	0	0	72	143
5:15 PM	18	0	15	0	33	0	0	0	0	0	0	35	17	0	52	41	56	0	0	97	182
5:30 PM	6	0	11	0	17	0	0	0	0	0	0	38	8	0	46	31	49	0	0	80	143
Grand Total	41	0	47	0	88	0	0	0	0	0	0	146	55	0	201	117	190	0	0	307	596
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	
Total %	6.9	0.0	7.9	0.0	14.8	0.0	0.0	0.0	0.0	0.0	0.0	24.5	9.2	0.0	33.7	19.6	31.9	0.0	0.0	51.5	100.0
PHF	0.69	0.69	0.69			1.00	1.00	1.00			0.97	0.97	0.97			0.79	0.79	0.79			0.82



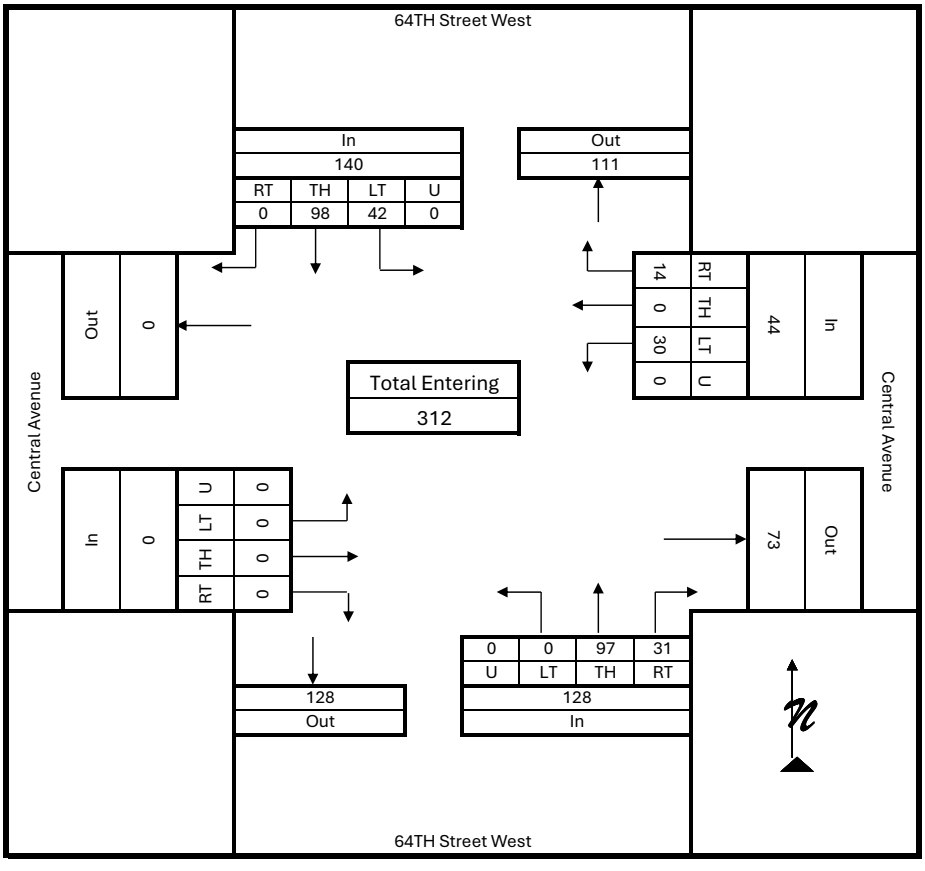
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Central Ave & 64TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64TH Street West	East/West Street:	Central Avenue

Vehicle Volumes and Adjustments

	64TH Street West Southbound					64TH Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	20	10	0	30	7	28	0	0	35	0	0	0	0	0	5	0	9	0	14	79
7:30 AM	0	20	16	0	36	5	14	0	0	19	0	0	0	0	0	1	0	5	0	6	61
7:45 AM	0	34	6	0	40	9	30	0	0	39	0	0	0	0	0	5	0	8	0	13	92
8:00 AM	0	24	10	0	34	10	25	0	0	35	0	0	0	0	0	3	0	8	0	11	80
Grand Total	0	98	42	0	140	31	97	0	0	128	0	0	0	0	0	14	0	30	0	44	312
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	4.1	2.4	0.0	3.6	0.0	1.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	7.1	0.0	3.3	0.0	4.5	
Total Truck %	0.0	4.1	2.4	0.0	3.6	0.0	1.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	7.1	0.0	3.3	0.0	4.5	
Total %	0.0	31.4	13.5	0.0	44.9	9.9	31.1	0.0	0.0	41.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	9.6	0.0	14.1	100.0
PHF	0.87	0.87	0.87			0.82	0.82	0.82			1.00	1.00	1.00			0.85	0.85	0.85			0.84



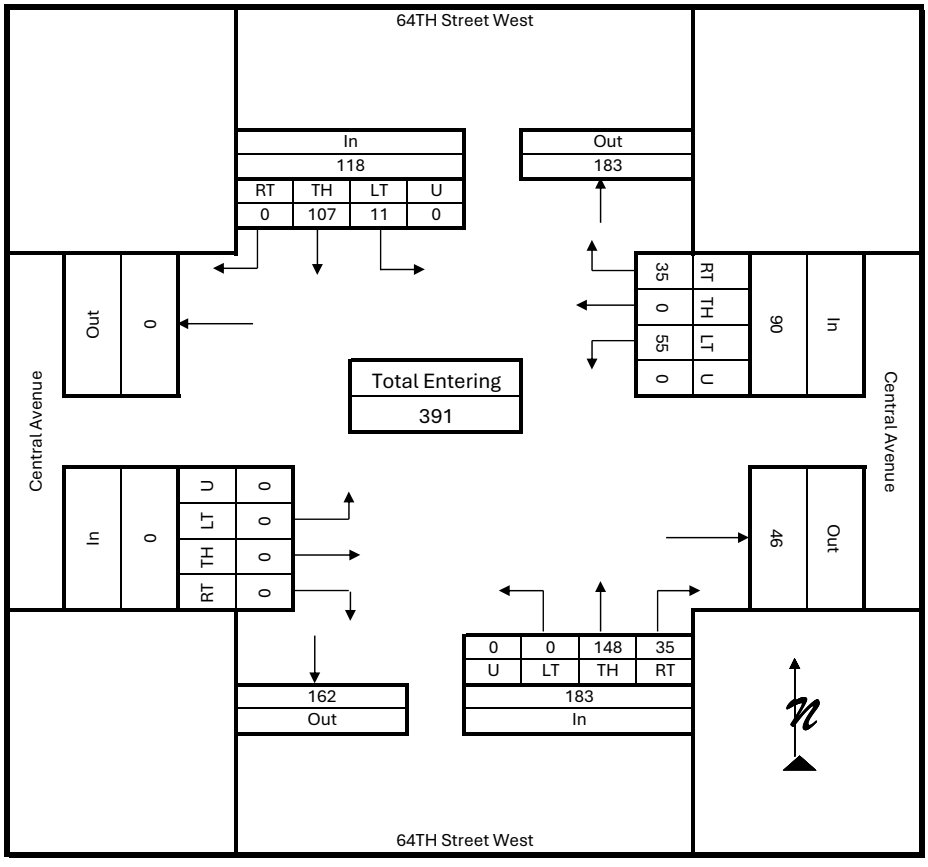
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Central Ave & 64TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64TH Street West	East/West Street:	Central Avenue

Vehicle Volumes and Adjustments

	64TH Street West Southbound					64TH Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	0	22	0	0	22	7	32	0	0	39	0	0	0	0	0	11	0	15	0	26	87
5:00 PM	0	30	6	0	36	17	42	0	0	59	0	0	0	0	0	10	0	12	0	22	117
5:15 PM	0	31	1	0	32	5	34	0	0	39	0	0	0	0	0	8	0	16	0	24	95
5:30 PM	0	24	4	0	28	6	40	0	0	46	0	0	0	0	0	6	0	12	0	18	92
Grand Total	0	107	11	0	118	35	148	0	0	183	0	0	0	0	0	35	0	55	0	90	391
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	1.9	0.0	0.0	1.7	0.0	1.4	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	1.9	0.0	0.0	1.7	0.0	1.4	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	27.4	2.8	0.0	30.2	9.0	37.9	0.0	0.0	46.8	0.0	0.0	0.0	0.0	0.0	9.0	0.0	14.1	0.0	23.0	100.0
PHF	0.81	0.81	0.81			0.79	0.79	0.79			1.00	1.00	1.00			1.00	1.00	1.00			0.84



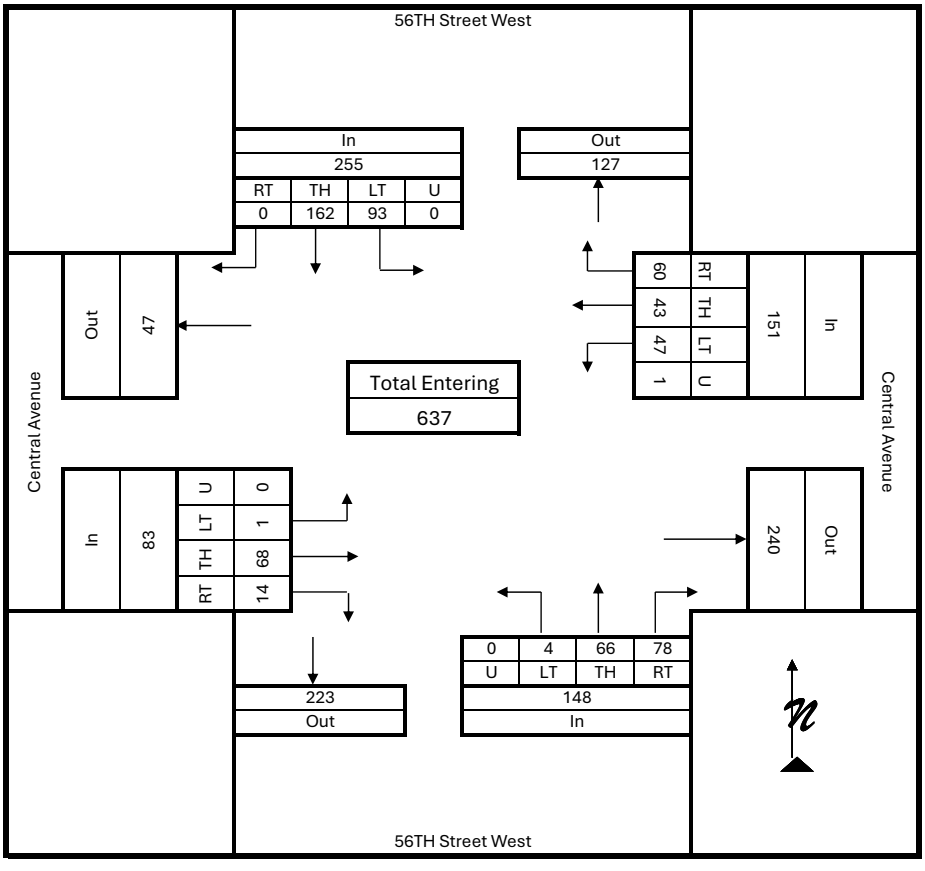
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Central Ave & 56TH ST West
Agency/Company:	Sanbell		
Date Performed:	Thursday, January 11, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56TH Street West	East/West Street:	Central Avenue

Vehicle Volumes and Adjustments

	56TH Street West Southbound					56TH Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	23	14	0	37	17	15	1	0	33	1	21	0	0	22	7	12	7	0	26	118
7:30 AM	0	54	21	0	75	25	16	0	0	41	6	16	0	0	22	23	5	12	0	40	178
7:45 AM	0	52	37	0	89	21	20	0	0	41	5	11	1	0	17	26	17	20	1	64	211
8:00 AM	0	33	21	0	54	15	15	3	0	33	2	20	0	0	22	4	9	8	0	21	130
Grand Total	0	162	93	0	255	78	66	4	0	148	14	68	1	0	83	60	43	47	1	151	637
Medium Truck %	0.0	0.6	1.1	0.0	0.8	0.0	1.5	25.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	2.6	
Heavy Truck %	0.0	1.2	1.1	0.0	1.2	0.0	4.5	50.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	3.3	4.7	2.1	0.0	3.3	
Total Truck %	0.0	1.9	2.2	0.0	2.0	0.0	6.1	75.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	10.0	4.7	2.1	0.0	6.0	
Total %	0.0	25.4	14.6	0.0	40.0	12.2	10.4	0.6	0.0	23.2	2.2	10.7	0.2	0.0	13.0	9.4	6.8	7.4	0.2	23.7	100.0
PHF	0.71	0.71	0.71			0.90	0.90	0.90			1.00	1.00	1.00			0.60	0.60	0.60			0.75



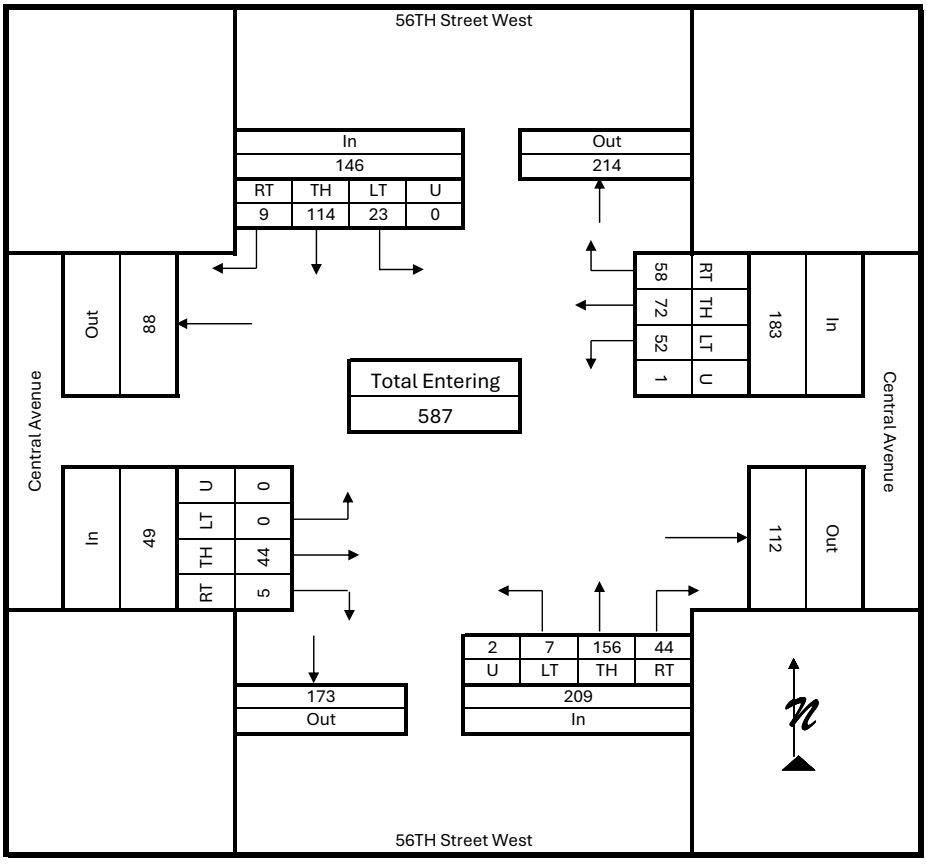
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Central Ave & 56TH ST West
Agency/Company:	Sanbell		
Date Performed:	Thursday, January 11, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56TH Street West	East/West Street:	Central Avenue

Vehicle Volumes and Adjustments

	56TH Street West Southbound					56TH Street West Northbound					Central Avenue Eastbound					Central Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	0	18	8	0	26	14	34	1	0	49	1	8	0	0	9	8	15	16	1	40	124
5:00 PM	3	41	6	0	50	15	44	2	2	63	2	22	0	0	24	18	22	20	0	60	197
5:15 PM	4	25	1	0	30	7	46	3	0	56	0	7	0	0	7	21	25	9	0	55	148
5:30 PM	2	30	8	0	40	8	32	1	0	41	2	7	0	0	9	11	10	7	0	28	118
Grand Total	9	114	23	0	146	44	156	7	2	209	5	44	0	0	49	58	72	52	1	183	587
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.9	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.9	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	1.5	19.4	3.9	0.0	24.9	7.5	26.6	1.2	0.3	35.6	0.9	7.5	0.0	0.0	8.3	9.9	12.3	8.9	0.2	31.2	100.0
PHF	0.73	0.73	0.73			0.84	0.84	0.84			0.52	0.52	0.52			0.77	0.77	0.77			0.75



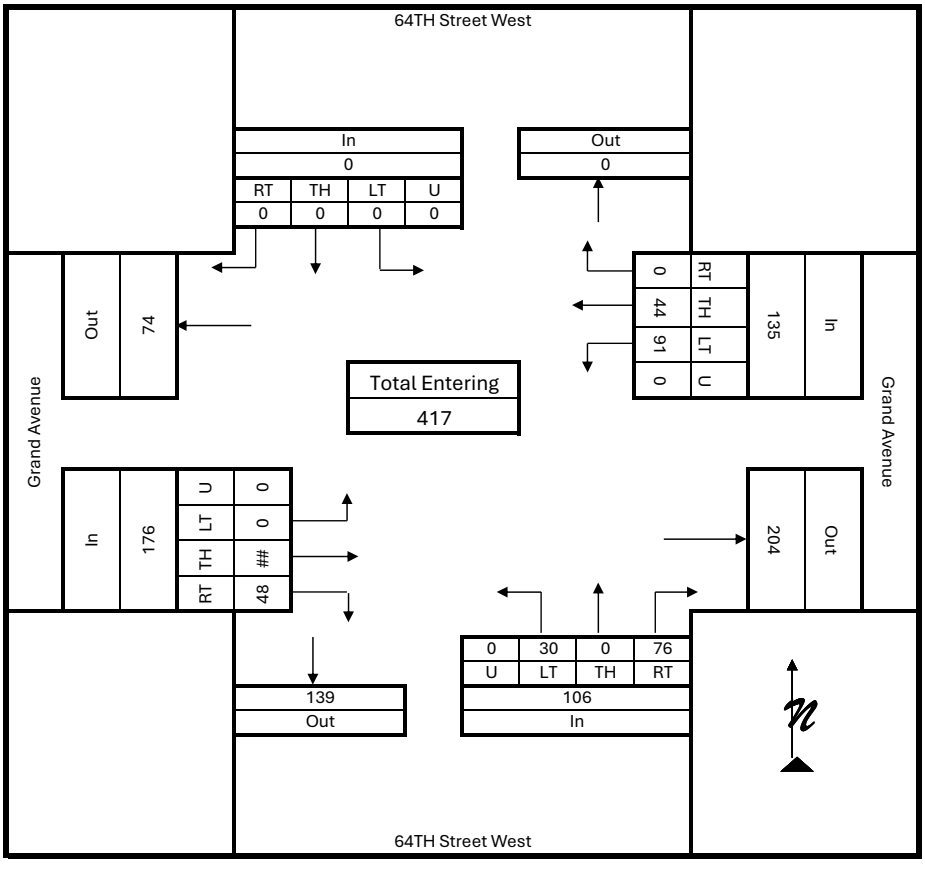
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Grand Ave & 64TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 16, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64TH Street West	East/West Street:	Grand Avenue

Vehicle Volumes and Adjustments

	64TH Street West Southbound					64TH Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	0	0	0	0	14	0	3	0	17	16	32	0	0	48	0	6	24	0	30	95
7:30 AM	0	0	0	0	0	21	0	7	0	28	12	40	0	0	52	0	11	18	0	29	109
7:45 AM	0	0	0	0	0	23	0	9	0	32	14	35	0	0	49	0	10	21	0	31	112
8:00 AM	0	0	0	0	0	18	0	11	0	29	6	21	0	0	27	0	17	28	0	45	101
Grand Total	0	0	0	0	0	76	0	30	0	106	48	128	0	0	176	0	44	91	0	135	417
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.9	0.0	1.6	0.0	0.0	1.1	0.0	6.8	1.1	0.0	3.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	1.9	0.0	0.8	0.0	0.0	0.6	0.0	0.0	1.1	0.0	0.7	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	2.8	0.0	2.3	0.0	0.0	1.7	0.0	6.8	2.2	0.0	3.7	
Total %	0.0	0.0	0.0	0.0	0.0	18.2	0.0	7.2	0.0	25.4	11.5	30.7	0.0	0.0	42.2	0.0	10.6	21.8	0.0	32.4	100.0
PHF	1.00	1.00	1.00			0.82	0.82	0.82			0.90	0.90	0.90			1.00	1.00	1.00			0.93



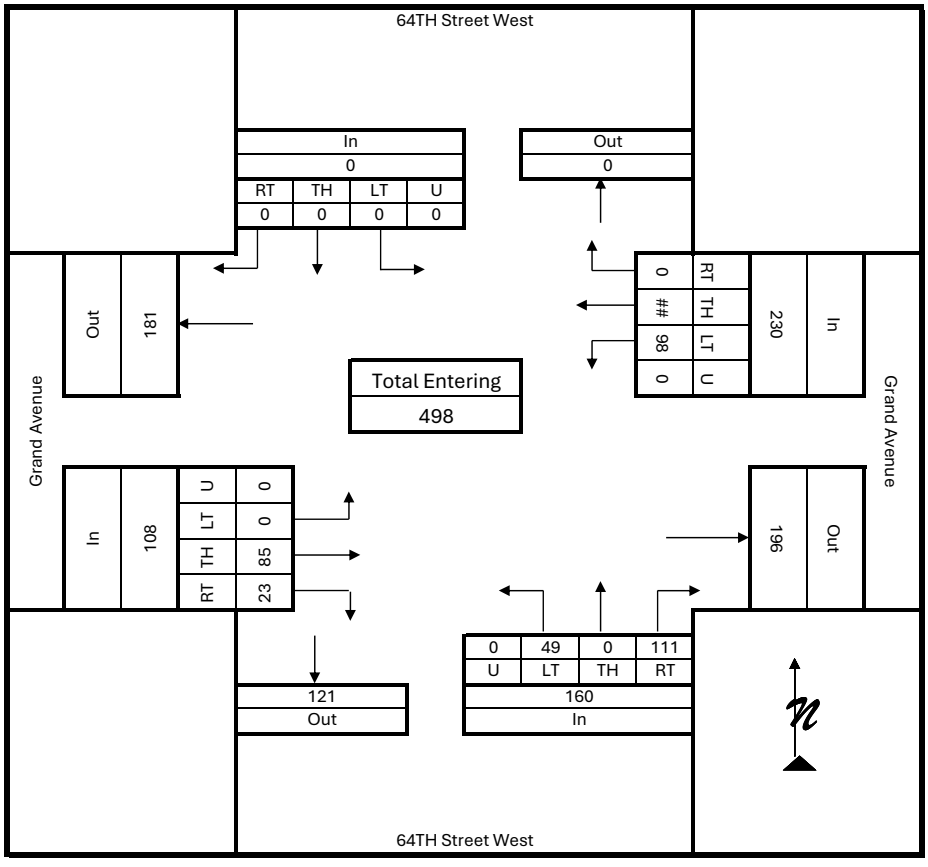
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Grand Ave & 64TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 16, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64TH Street West	East/West Street:	Grand Avenue

Vehicle Volumes and Adjustments

	64TH Street West Southbound					64TH Street West Northbound					Grand Avenue Eastbound					Grand Avenue Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	0	0	0	0	0	20	0	16	0	36	5	26	0	0	31	0	34	21	0	55	122
5:00 PM	0	0	0	0	0	33	0	6	0	39	10	22	0	0	32	0	36	20	0	56	127
5:15 PM	0	0	0	0	0	34	0	17	0	51	3	20	0	0	23	0	28	23	0	51	125
5:30 PM	0	0	0	0	0	24	0	10	0	34	5	17	0	0	22	0	34	34	0	68	124
Grand Total	0	0	0	0	0	111	0	49	0	160	23	85	0	0	108	0	132	98	0	230	498
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.6	0.0	2.4	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.6	0.0	2.4	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	0.0	0.0	0.0	0.0	22.3	0.0	9.8	0.0	32.1	4.6	17.1	0.0	0.0	21.7	0.0	26.5	19.7	0.0	46.2	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			0.84	0.84	0.84			1.00	1.00	1.00			0.98



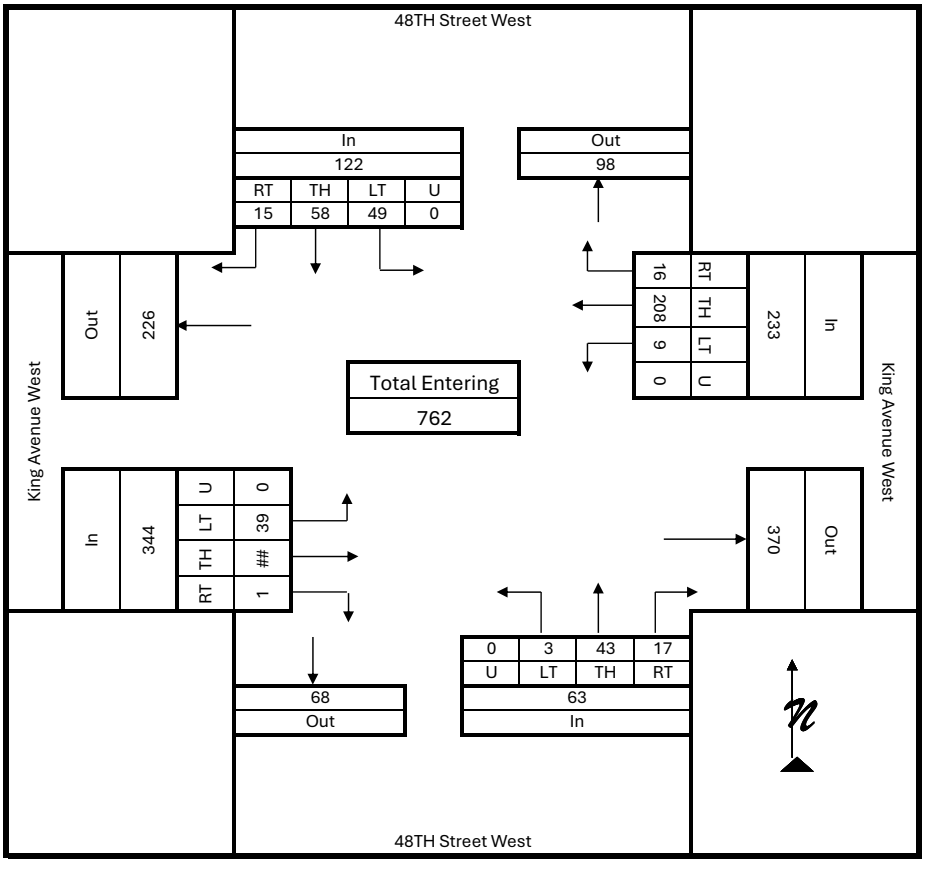
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	King Ave West & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 8, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	King Avenue West

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					King Avenue West Eastbound					King Avenue West Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		
7:15 AM	2	15	10	0	27	4	12	0	0	16	1	61	7	0	69	3	45	3	0	51	163
7:30 AM	3	9	4	0	16	5	13	2	0	20	0	83	12	0	95	6	54	2	0	62	193
7:45 AM	4	20	20	0	44	4	10	0	0	14	0	93	9	0	102	2	65	2	0	69	229
8:00 AM	6	14	15	0	35	4	8	1	0	13	0	67	11	0	78	5	44	2	0	51	177
Grand Total	15	58	49	0	122	17	43	3	0	63	1	304	39	0	344	16	208	9	0	233	762
Medium Truck %	0.0	1.7	0.0	0.0	0.8	0.0	4.7	33.3	0.0	4.8	0.0	4.9	2.6	0.0	4.7	6.3	4.8	0.0	0.0	4.7	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	4.9	0.0	5.8	0.0	0.0	5.2	
Total Truck %	0.0	1.7	0.0	0.0	0.8	0.0	4.7	33.3	0.0	4.8	0.0	10.5	2.6	0.0	9.6	6.3	10.6	0.0	0.0	9.9	
Total %	2.0	7.6	6.4	0.0	16.0	2.2	5.6	0.4	0.0	8.3	0.1	39.9	5.1	0.0	45.1	2.1	27.3	1.2	0.0	30.6	100.0
PHF	0.69	0.69	0.69			1.00	1.00	1.00			0.84	0.84	0.84			0.85	0.85	0.85			0.83



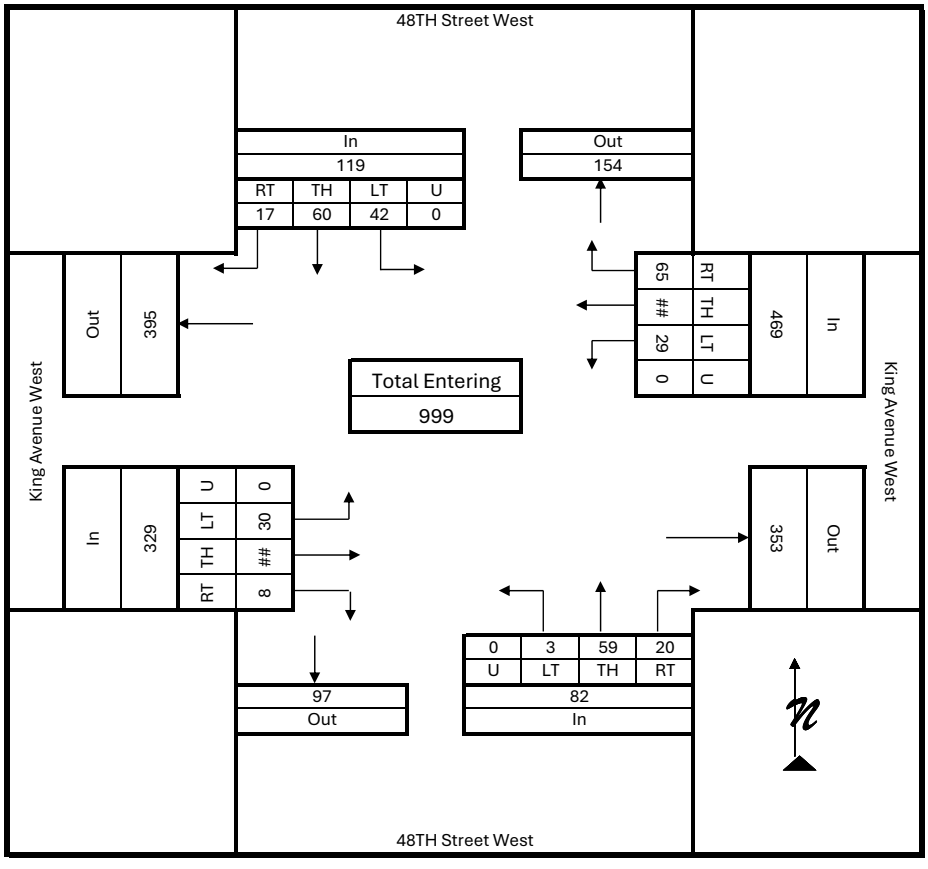
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	King Ave West & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 8, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	King Avenue West

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					King Avenue West Eastbound					King Avenue West Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		0.98	0.98	0.98	0.98		
4:45 PM	2	16	12	0	30	3	7	0	0	10	2	76	6	0	84	11	95	5	0	111	235
5:00 PM	7	14	12	0	33	5	15	0	0	20	3	80	8	0	91	18	76	7	0	101	245
5:15 PM	4	17	9	0	30	7	21	2	0	30	2	80	11	0	93	19	104	10	0	133	286
5:30 PM	4	13	9	0	26	5	16	1	0	22	1	55	5	0	61	17	100	7	0	124	233
Grand Total	17	60	42	0	119	20	59	3	0	82	8	291	30	0	329	65	375	29	0	469	999
Medium Truck %	0.0	3.3	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.3	0.0	0.0	0.2	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	3.3	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.9	0.0	0.3	0.0	0.0	0.2	
Total %	1.7	6.0	4.2	0.0	11.9	2.0	5.9	0.3	0.0	8.2	0.8	29.1	3.0	0.0	32.9	6.5	37.5	2.9	0.0	46.9	100.0
PHF	0.99	0.99	0.99			0.68	0.68	0.68			0.88	0.88	0.88			0.88	0.88	0.88			0.87



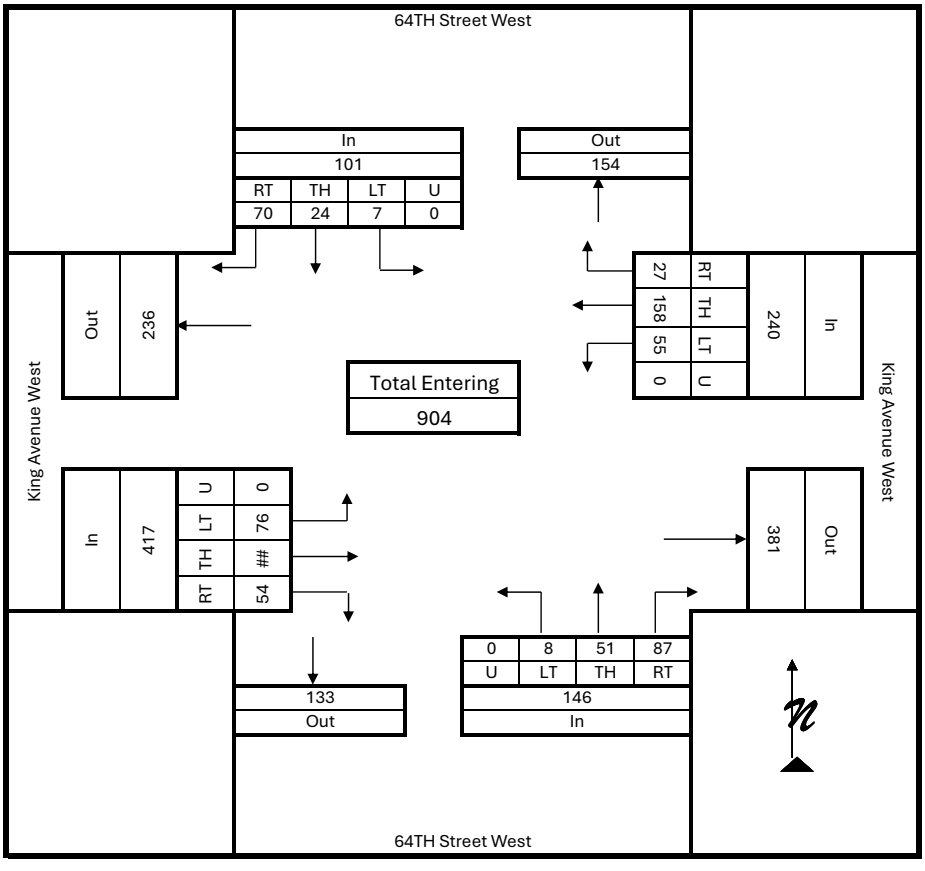
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	King Ave & 64TH ST West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64TH Street West	East/West Street:	King Avenue West

Vehicle Volumes and Adjustments

	64TH Street West Southbound					64TH Street West Northbound					King Avenue West Eastbound					King Avenue West Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
7:15 AM	11	10	3	0	24	8	8	1	0	17	5	72	15	0	92	6	31	11	0	48	181
7:30 AM	21	5	0	0	26	17	5	0	0	22	21	80	25	0	126	4	39	18	0	61	235
7:45 AM	21	5	3	0	29	31	17	3	0	51	27	76	18	0	121	9	61	19	0	89	290
8:00 AM	17	4	1	0	22	31	21	4	0	56	1	59	18	0	78	8	27	7	0	42	198
Grand Total	70	24	7	0	101	87	51	8	0	146	54	287	76	0	417	27	158	55	0	240	904
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.3	0.0	0.0	1.2	0.0	0.0	1.8	0.0	0.4	
Heavy Truck %	0.0	0.0	14.3	0.0	1.0	1.1	3.9	0.0	0.0	2.1	0.0	3.1	6.6	0.0	3.4	0.0	1.9	1.8	0.0	1.7	
Total Truck %	0.0	0.0	14.3	0.0	1.0	1.1	3.9	0.0	0.0	2.1	7.4	3.5	6.6	0.0	4.6	0.0	1.9	3.6	0.0	2.1	
Total %	7.7	2.7	0.8	0.0	11.2	9.6	5.6	0.9	0.0	16.2	6.0	31.7	8.4	0.0	46.1	3.0	17.5	6.1	0.0	26.5	100.0
PHF	0.87	0.87	0.87			0.72	0.72	0.72			0.86	0.86	0.86			0.68	0.68	0.68			0.78



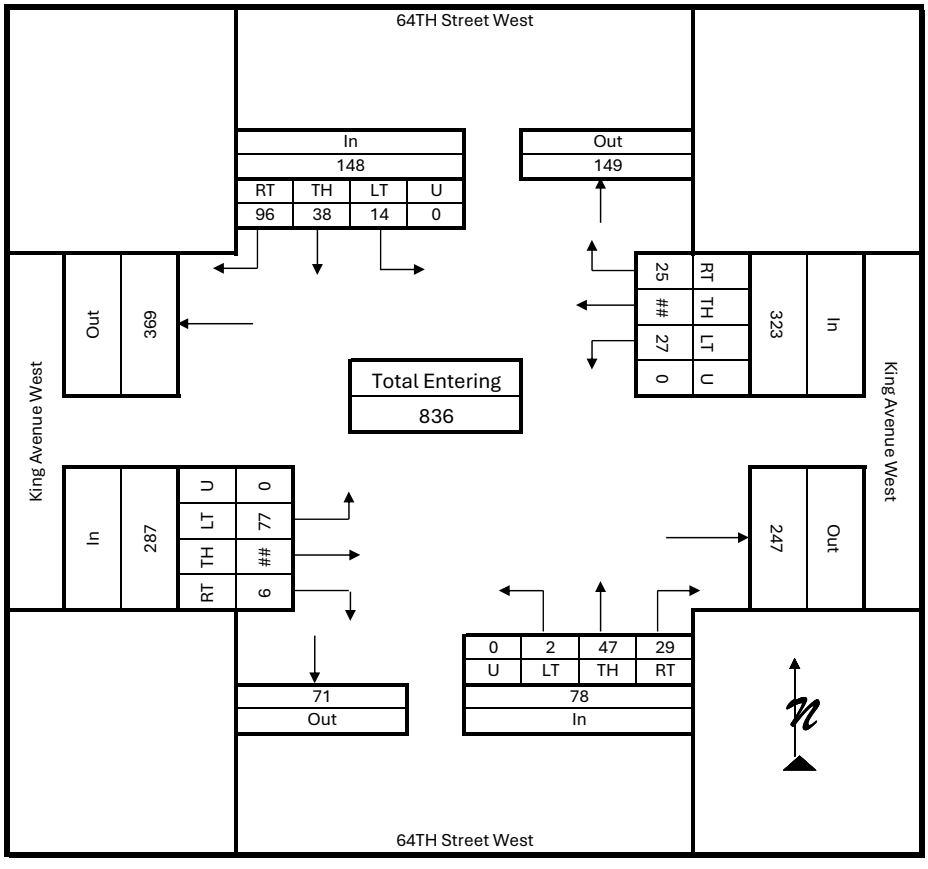
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	King Ave & 64TH ST West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	64TH Street West	East/West Street:	King Avenue West

Vehicle Volumes and Adjustments

	64TH Street West Southbound					64TH Street West Northbound					King Avenue West Eastbound					King Avenue West Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
4:45 PM	23	10	3	0	36	7	15	1	0	23	3	49	19	0	71	7	67	10	0	84	214
5:00 PM	33	8	6	0	47	9	12	1	0	22	2	61	26	0	89	8	70	4	0	82	240
5:15 PM	18	12	4	0	34	6	10	0	0	16	1	59	13	0	73	4	92	10	0	106	229
5:30 PM	22	8	1	0	31	7	10	0	0	17	0	35	19	0	54	6	42	3	0	51	153
Grand Total	96	38	14	0	148	29	47	2	0	78	6	204	77	0	287	25	271	27	0	323	836
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	1.3	0.0	2.0	0.0	0.0	1.4	0.0	1.1	0.0	0.0	0.9	
Total Truck %	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	1.3	0.0	2.0	0.0	0.0	1.4	0.0	1.1	0.0	0.0	0.9	
Total %	11.5	4.5	1.7	0.0	17.7	3.5	5.6	0.2	0.0	9.3	0.7	24.4	9.2	0.0	34.3	3.0	32.4	3.2	0.0	38.6	100.0
PHF	0.79	0.79	0.79			0.89	0.89	0.89			0.81	0.81	0.81			0.99	0.99	0.99			0.87



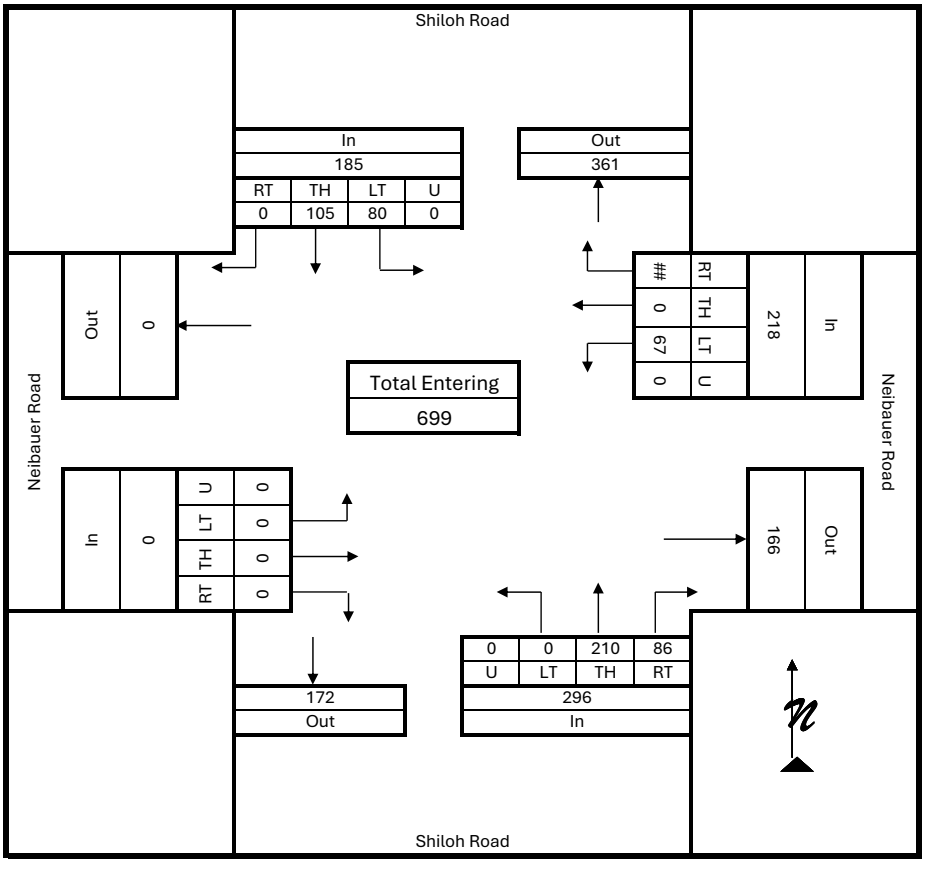
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Neibauer RD & Shiloh RD
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	Shiloh Road	East/West Street:	Neibauer Road

Vehicle Volumes and Adjustments

	Shiloh Road Southbound					Shiloh Road Northbound					Neibauer Road Eastbound					Neibauer Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		
7:15 AM	0	23	22	0	45	14	47	0	0	61	0	0	0	0	0	27	0	12	0	39	145
7:30 AM	0	26	20	0	46	28	65	0	0	93	0	0	0	0	0	46	0	16	0	62	201
7:45 AM	0	29	20	0	49	30	51	0	0	81	0	0	0	0	0	46	0	19	0	65	195
8:00 AM	0	27	18	0	45	14	47	0	0	61	0	0	0	0	0	32	0	20	0	52	158
Grand Total	0	105	80	0	185	86	210	0	0	296	0	0	0	0	0	151	0	67	0	218	699
Medium Truck %	0.0	2.9	0.0	0.0	1.6	2.3	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.7	0.0	4.5	0.0	1.8	
Heavy Truck %	0.0	16.2	2.5	0.0	10.3	2.3	10.0	0.0	0.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	2.8	
Total Truck %	0.0	19.0	2.5	0.0	11.9	4.7	10.0	0.0	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.7	0.0	13.4	0.0	4.6	
Total %	0.0	15.0	11.4	0.0	26.5	12.3	30.0	0.0	0.0	42.3	0.0	0.0	0.0	0.0	0.0	21.6	0.0	9.6	0.0	31.2	100.0
PHF	1.00	1.00	1.00			0.80	0.80	0.80			1.00	1.00	1.00			0.88	0.88	0.88			0.87



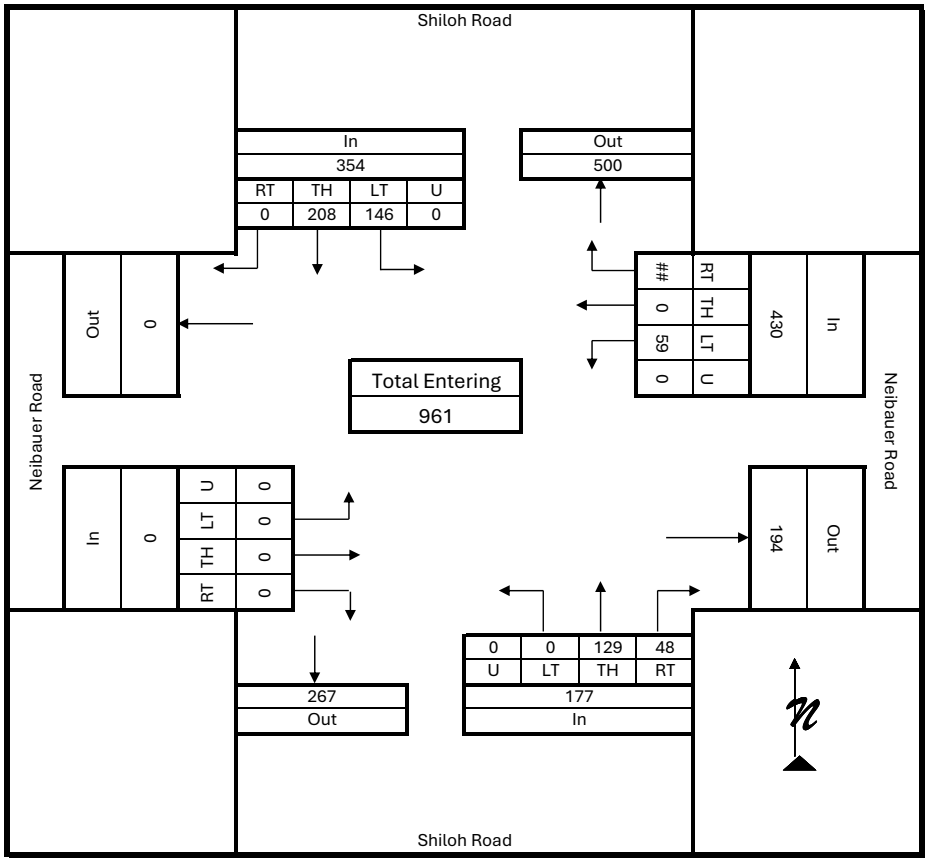
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Neibauer RD & Shiloh RD
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	Shiloh Road	East/West Street:	Neibauer Road

Vehicle Volumes and Adjustments

	Shiloh Road Southbound					Shiloh Road Northbound					Neibauer Road Eastbound					Neibauer Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		
4:45 PM	0	45	29	0	74	11	42	0	0	53	0	0	0	0	0	143	0	11	0	154	281
5:00 PM	0	45	45	0	90	11	32	0	0	43	0	0	0	0	0	115	0	16	0	131	264
5:15 PM	0	61	46	0	107	16	29	0	0	45	0	0	0	0	0	74	0	20	0	94	246
5:30 PM	0	57	26	0	83	10	26	0	0	36	0	0	0	0	0	39	0	12	0	51	170
Grand Total	0	208	146	0	354	48	129	0	0	177	0	0	0	0	0	371	0	59	0	430	961
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.5	0.0	0.0	0.3	0.0	3.9	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	1.6	0.0	1.7	0.0	1.6	
Total Truck %	0.0	0.5	0.0	0.0	0.3	0.0	5.4	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	1.7	0.0	1.6	
Total %	0.0	21.6	15.2	0.0	36.8	5.0	13.4	0.0	0.0	18.4	0.0	0.0	0.0	0.0	0.0	38.6	0.0	6.1	0.0	44.7	100.0
PHF	1.00	1.00	1.00			0.83	0.83	0.83			1.00	1.00	1.00			0.70	0.70	0.70			0.85



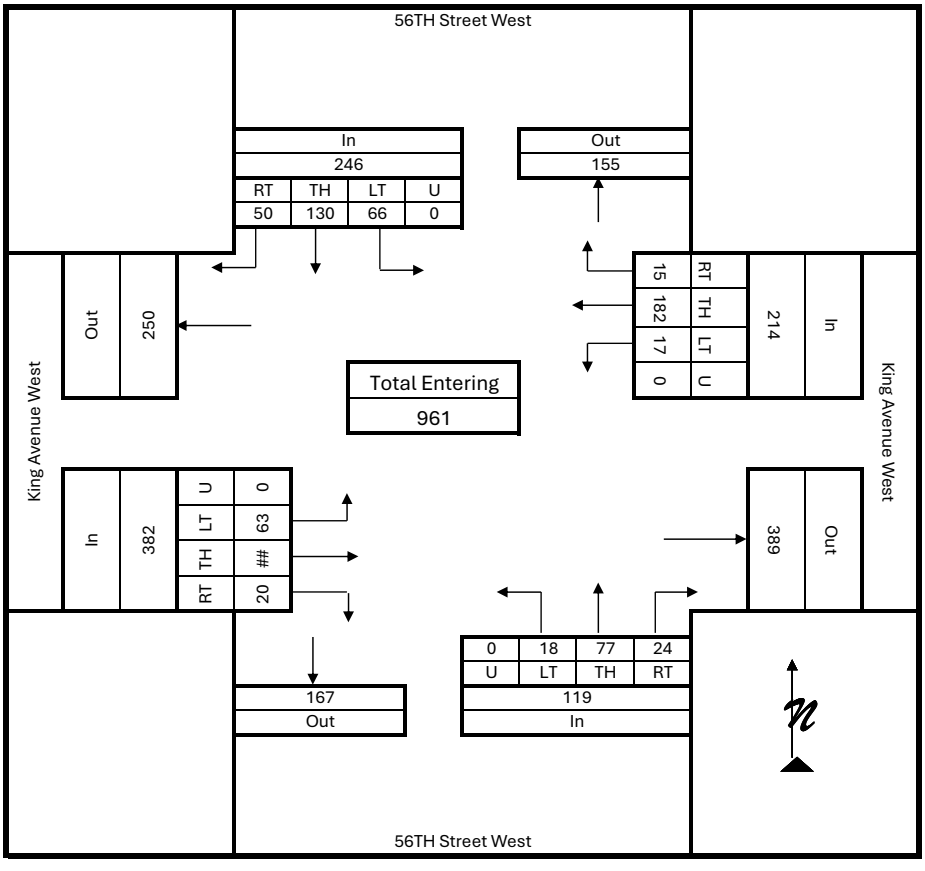
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	King Ave & 56TH ST West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56TH Street West	East/West Street:	King Avenue West

Vehicle Volumes and Adjustments

	56TH Street West Southbound					56TH Street West Northbound					King Avenue West Eastbound					King Avenue West Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
7:15 AM	8	26	14	0	48	5	14	3	0	22	2	72	10	0	84	3	43	3	0	49	203
7:30 AM	14	30	17	0	61	5	15	7	0	27	10	67	19	0	96	4	41	5	0	50	234
7:45 AM	17	42	19	0	78	8	21	8	0	37	7	85	23	0	115	1	64	4	0	69	299
8:00 AM	11	32	16	0	59	6	27	0	0	33	1	75	11	0	87	7	34	5	0	46	225
Grand Total	50	130	66	0	246	24	77	18	0	119	20	299	63	0	382	15	182	17	0	214	961
Medium Truck %	0.0	0.0	1.5	0.0	0.4	0.0	2.6	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	
Heavy Truck %	0.0	0.8	1.5	0.0	0.8	4.2	1.3	0.0	0.0	1.7	10.0	1.3	6.3	0.0	2.6	20.0	2.2	5.9	0.0	3.7	
Total Truck %	0.0	0.8	3.0	0.0	1.2	4.2	3.9	0.0	0.0	3.4	10.0	1.3	6.3	0.0	2.6	20.0	2.7	5.9	0.0	4.2	
Total %	5.2	13.5	6.9	0.0	25.6	2.5	8.0	1.9	0.0	12.4	2.1	31.1	6.6	0.0	39.8	1.6	18.9	1.8	0.0	22.3	100.0
PHF	0.79	0.79	0.79			0.80	0.80	0.80			0.83	0.83	0.83			0.78	0.78	0.78			0.80



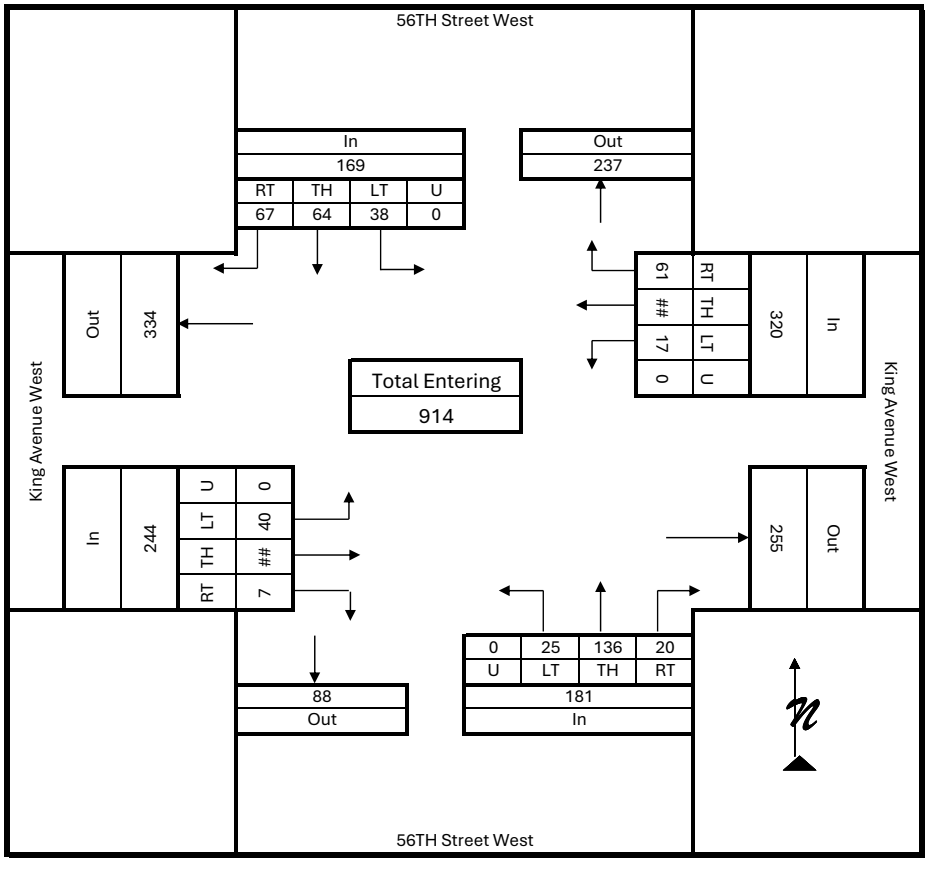
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	King Ave & 56TH ST West
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56TH Street West	East/West Street:	King Avenue West

Vehicle Volumes and Adjustments

	56TH Street West Southbound					56TH Street West Northbound					King Avenue West Eastbound					King Avenue West Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
4:45 PM	15	16	10	0	41	7	21	3	0	31	1	46	14	0	61	11	63	4	0	78	211
5:00 PM	21	18	9	0	48	3	46	8	0	57	2	62	9	0	73	18	61	8	0	87	265
5:15 PM	21	18	11	0	50	3	40	11	0	54	1	58	8	0	67	20	69	4	0	93	264
5:30 PM	10	12	8	0	30	7	29	3	0	39	3	31	9	0	43	12	49	1	0	62	174
Grand Total	67	64	38	0	169	20	136	25	0	181	7	197	40	0	244	61	242	17	0	320	914
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.6	14.3	1.5	0.0	0.0	1.6	0.0	1.2	0.0	0.0	0.9	
Total Truck %	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.6	14.3	1.5	0.0	0.0	1.6	0.0	1.2	0.0	0.0	0.9	
Total %	7.3	7.0	4.2	0.0	18.5	2.2	14.9	2.7	0.0	19.8	0.8	21.6	4.4	0.0	26.7	6.7	26.5	1.9	0.0	35.0	100.0
PHF	0.88	0.88	0.88			0.79	0.79	0.79			0.84	0.84	0.84			0.92	0.92	0.92			0.86



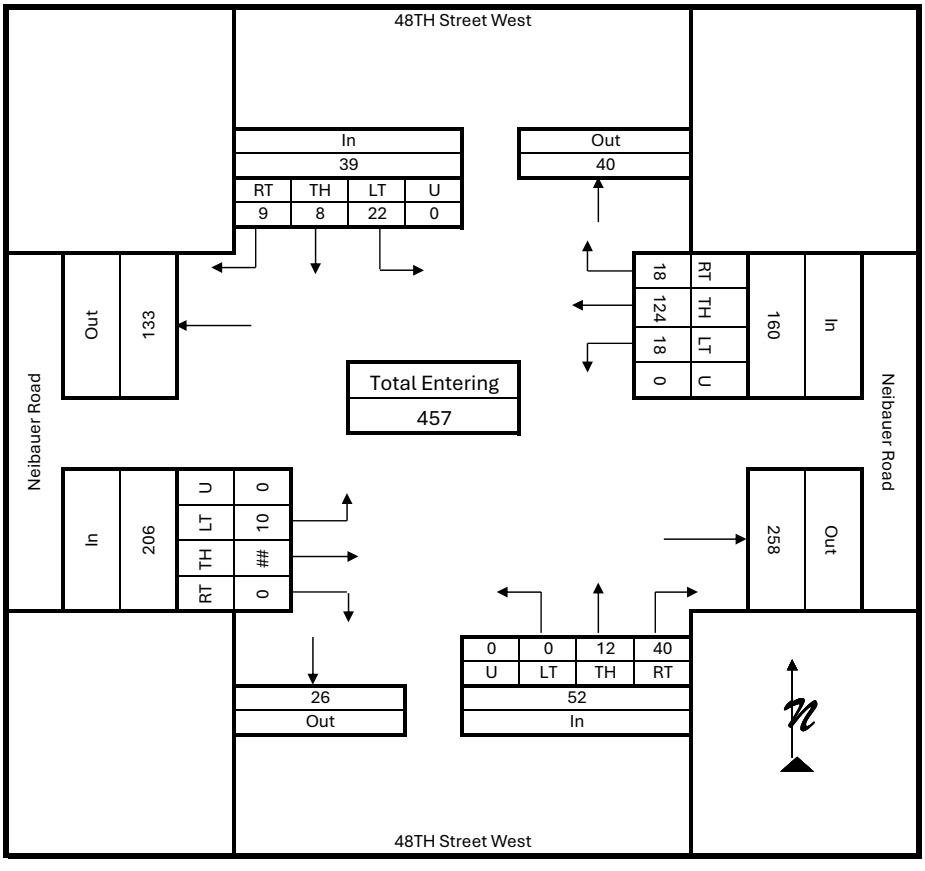
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Neibauer RD & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	Neibauer Road

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					Neibauer Road Eastbound					Neibauer Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		
7:15 AM	2	1	5	0	8	10	3	0	0	13	0	39	3	0	42	5	24	4	0	33	96
7:30 AM	2	3	5	0	10	10	5	0	0	15	0	67	1	0	68	6	31	3	0	40	133
7:45 AM	3	4	5	0	12	13	3	0	0	16	0	48	3	0	51	4	41	4	0	49	128
8:00 AM	2	0	7	0	9	7	1	0	0	8	0	42	3	0	45	3	28	7	0	38	100
Grand Total	9	8	22	0	39	40	12	0	0	52	0	196	10	0	206	18	124	18	0	160	457
Medium Truck %	0.0	12.5	0.0	0.0	2.6	2.5	0.0	0.0	0.0	1.9	0.0	1.0	0.0	0.0	1.0	5.6	4.0	0.0	0.0	3.8	
Heavy Truck %	0.0	0.0	4.5	0.0	2.6	2.5	0.0	0.0	0.0	1.9	0.0	11.2	0.0	0.0	10.7	0.0	16.1	0.0	0.0	12.5	
Total Truck %	0.0	12.5	4.5	0.0	5.1	5.0	0.0	0.0	0.0	3.8	0.0	12.2	0.0	0.0	11.7	5.6	20.2	0.0	0.0	16.3	
Total %	2.0	1.8	4.8	0.0	8.5	8.8	2.6	0.0	0.0	11.4	0.0	42.9	2.2	0.0	45.1	3.9	27.1	3.9	0.0	35.0	100.0
PHF	0.98	0.98	0.98			0.84	0.84	0.84			0.75	0.75	0.75			0.99	0.99	0.99			0.85



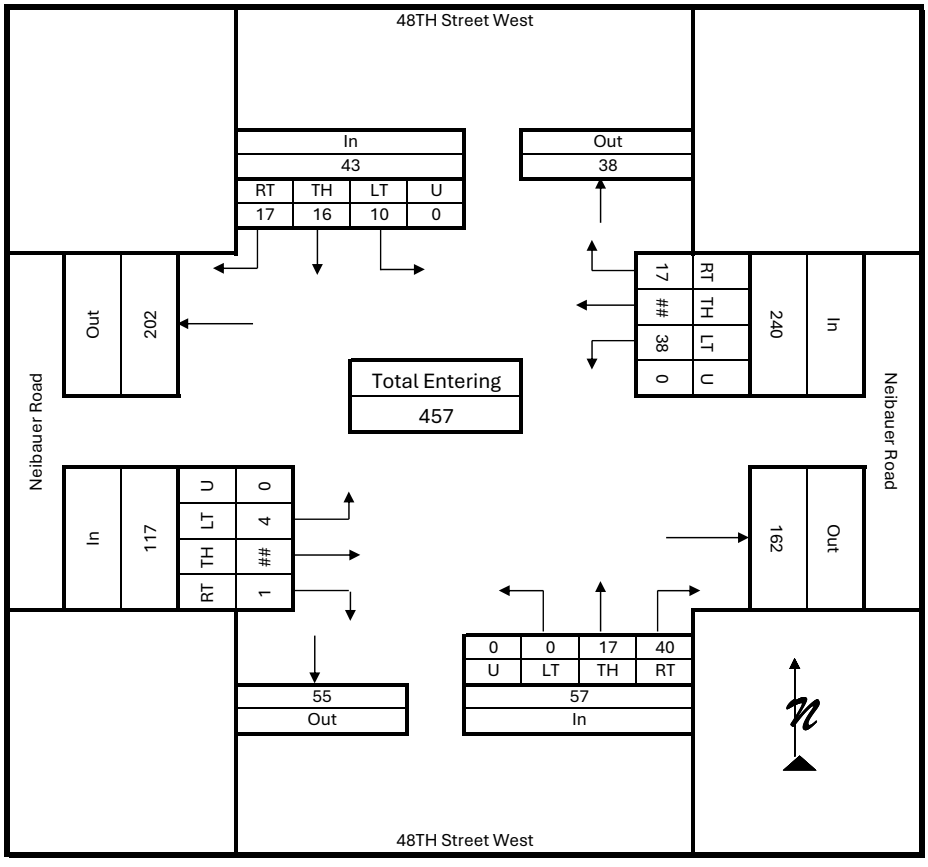
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Neibauer RD & 48TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	48TH Street West	East/West Street:	Neibauer Road

Vehicle Volumes and Adjustments

	48TH Street West Southbound					48TH Street West Northbound					Neibauer Road Eastbound					Neibauer Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		
4:45 PM	4	1	3	0	8	10	3	0	0	13	0	36	1	0	37	5	36	7	0	48	106
5:00 PM	6	4	1	0	11	8	6	0	0	14	0	30	1	0	31	3	39	10	0	52	108
5:15 PM	6	6	3	0	15	10	4	0	0	14	1	23	1	0	25	6	61	9	0	76	130
5:30 PM	1	5	3	0	9	12	4	0	0	16	0	23	1	0	24	3	49	12	0	64	113
Grand Total	17	16	10	0	43	40	17	0	0	57	1	112	4	0	117	17	185	38	0	240	457
Medium Truck %	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	1.8	0.0	0.9	0.0	0.0	0.9	0.0	0.5	0.0	0.0	0.4	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	1.8	0.0	5.4	0.0	0.0	5.1	0.0	0.0	2.6	0.0	0.4	
Total Truck %	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	3.5	0.0	6.3	0.0	0.0	6.0	0.0	0.5	2.6	0.0	0.8	
Total %	3.7	3.5	2.2	0.0	9.4	8.8	3.7	0.0	0.0	12.5	0.2	24.5	0.9	0.0	25.6	3.7	40.5	8.3	0.0	52.5	100.0
PHF	0.72	0.72	0.72			1.00	1.00	1.00			1.00	1.00	1.00			0.80	0.80	0.80			0.89



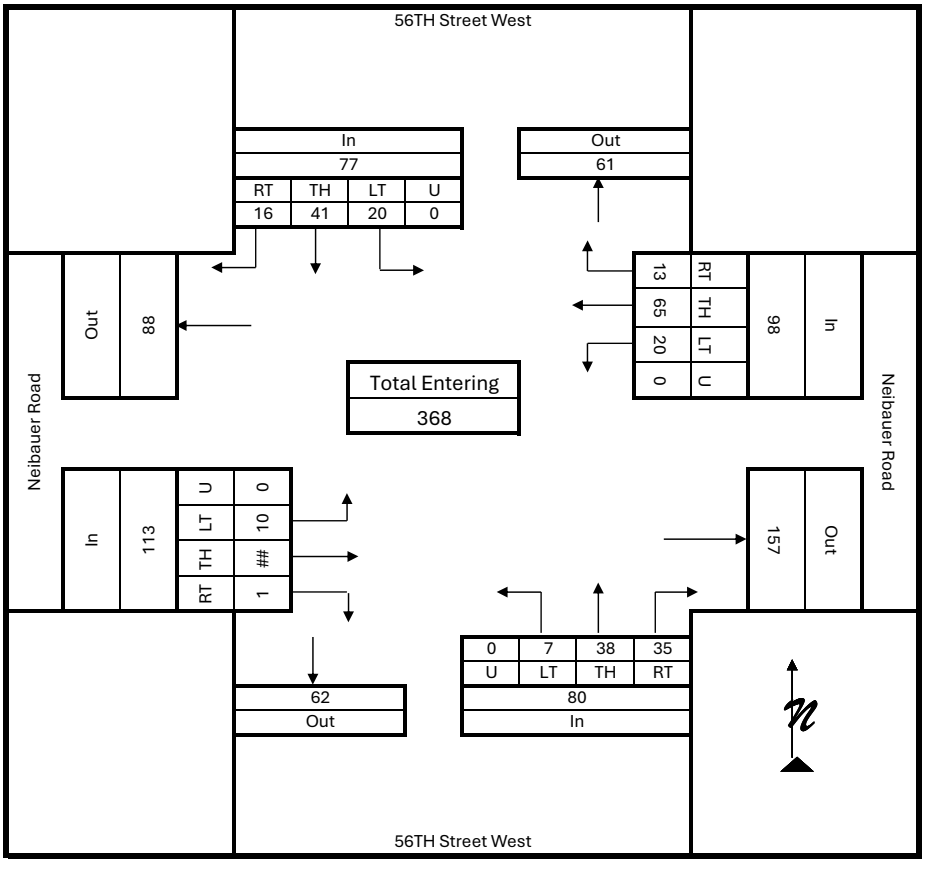
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Neibauer RD & 56TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56TH Street West	East/West Street:	Neibauer Road

Vehicle Volumes and Adjustments

	56TH Street West Southbound					56TH Street West Northbound					Neibauer Road Eastbound					Neibauer Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		
7:15 AM	3	8	1	0	12	13	6	1	0	20	0	20	1	0	21	3	10	5	0	18	71
7:30 AM	7	13	6	0	26	11	11	1	0	23	0	29	1	0	30	4	16	6	0	26	105
7:45 AM	4	13	6	0	23	6	11	2	0	19	0	26	5	0	31	5	26	3	0	34	107
8:00 AM	2	7	7	0	16	5	10	3	0	18	1	27	3	0	31	1	13	6	0	20	85
Grand Total	16	41	20	0	77	35	38	7	0	80	1	102	10	0	113	13	65	20	0	98	368
Medium Truck %	6.3	0.0	0.0	0.0	1.3	0.0	0.0	14.3	0.0	1.3	0.0	1.0	0.0	0.0	0.9	0.0	4.6	0.0	0.0	3.1	
Heavy Truck %	0.0	31.7	5.0	0.0	18.2	34.3	18.4	14.3	0.0	25.0	0.0	9.8	0.0	0.0	8.8	23.1	10.8	60.0	0.0	22.4	
Total Truck %	6.3	31.7	5.0	0.0	19.5	34.3	18.4	28.6	0.0	26.3	0.0	10.8	0.0	0.0	9.7	23.1	15.4	60.0	0.0	25.5	
Total %	4.3	11.1	5.4	0.0	20.9	9.5	10.3	1.9	0.0	21.7	0.3	27.7	2.7	0.0	30.7	3.5	17.7	5.4	0.0	26.6	100.0
PHF	0.73	0.73	0.73			0.85	0.85	0.85			0.92	0.92	0.92			0.94	0.94	0.94			0.86



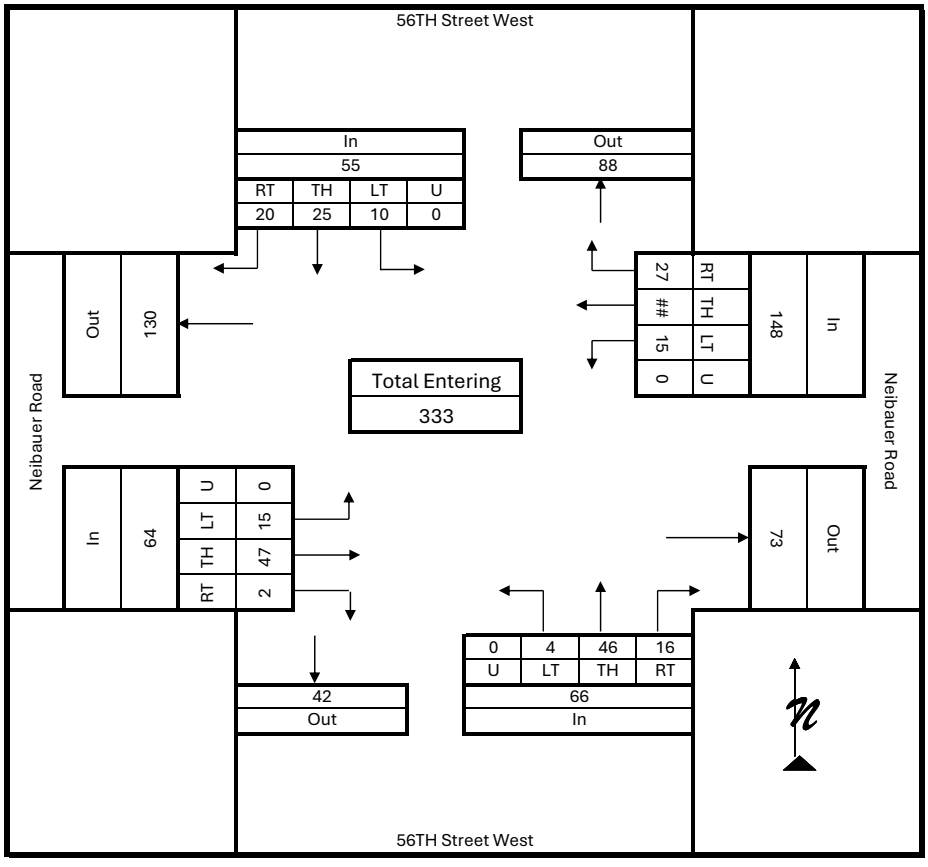
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Neibauer RD & 56TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, September 12, 2023	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	56TH Street West	East/West Street:	Neibauer Road

Vehicle Volumes and Adjustments

	56TH Street West Southbound					56TH Street West Northbound					Neibauer Road Eastbound					Neibauer Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95		
4:45 PM	2	7	3	0	12	3	10	3	0	16	0	16	2	0	18	6	23	3	0	32	78
5:00 PM	4	7	1	0	12	5	15	0	0	20	0	14	5	0	19	3	22	3	0	28	79
5:15 PM	8	4	4	0	16	5	8	1	0	14	1	7	3	0	11	7	38	5	0	50	91
5:30 PM	6	7	2	0	15	3	13	0	0	16	1	10	5	0	16	11	23	4	0	38	85
Grand Total	20	25	10	0	55	16	46	4	0	66	2	47	15	0	64	27	106	15	0	148	333
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	5.0	0.0	0.0	0.0	1.8	18.8	4.3	0.0	0.0	7.6	0.0	4.3	0.0	0.0	3.1	3.7	0.0	0.0	0.0	0.7	
Total Truck %	5.0	0.0	0.0	0.0	1.8	18.8	4.3	0.0	0.0	7.6	0.0	4.3	0.0	0.0	3.1	3.7	0.0	0.0	0.0	0.7	
Total %	6.0	7.5	3.0	0.0	16.5	4.8	13.8	1.2	0.0	19.8	0.6	14.1	4.5	0.0	19.2	8.1	31.8	4.5	0.0	44.4	100.0
PHF	0.86	0.86	0.86			1.00	1.00	1.00			1.00	1.00	1.00			0.74	0.74	0.74			0.92



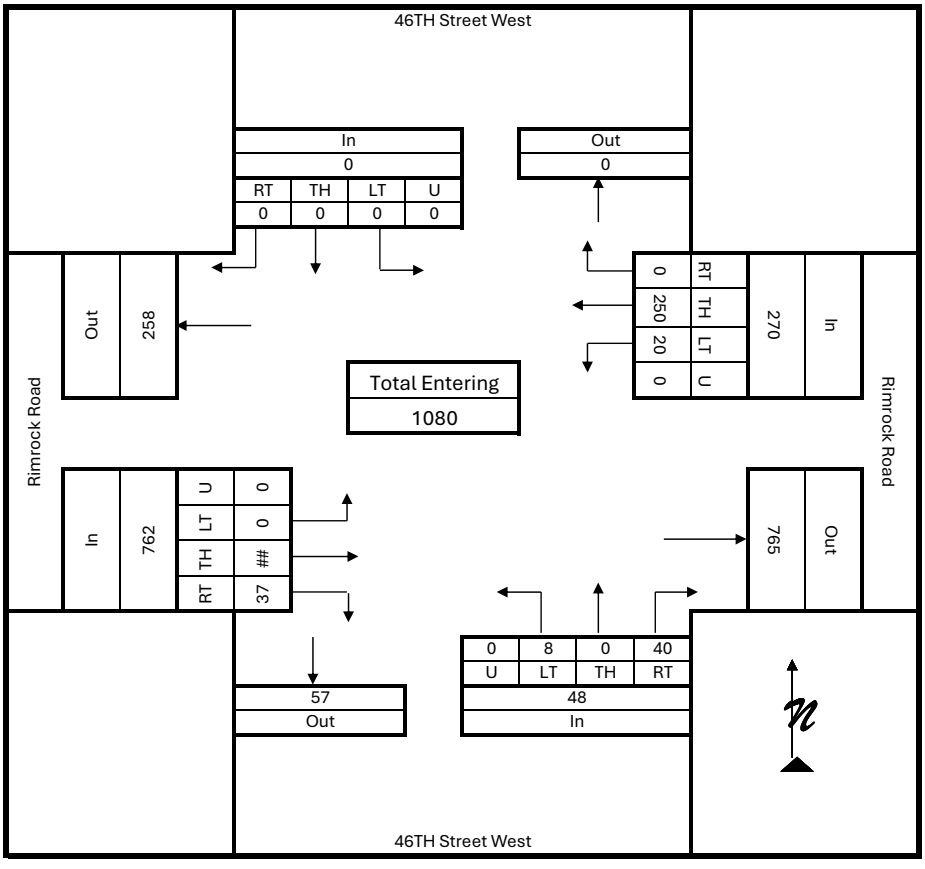
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 46TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	46TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	46TH Street West Southbound					46TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	0	0	0	0	7	0	1	0	8	1	183	0	0	184	0	41	3	0	44	236
7:30 AM	0	0	0	0	0	10	0	2	0	12	4	212	0	0	216	0	63	3	0	66	294
7:45 AM	0	0	0	0	0	14	0	4	0	18	18	157	0	0	175	0	70	6	0	76	269
8:00 AM	0	0	0	0	0	9	0	1	0	10	14	173	0	0	187	0	76	8	0	84	281
Grand Total	0	0	0	0	0	40	0	8	0	48	37	725	0	0	762	0	250	20	0	270	1080
Medium Truck %	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.1	2.7	1.5	0.0	0.0	1.6	0.0	2.0	0.0	0.0	1.9	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	1.2	0.0	0.0	1.1	
Total Truck %	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.1	2.7	1.7	0.0	0.0	1.7	0.0	3.2	0.0	0.0	3.0	
Total %	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.7	0.0	4.4	3.4	67.1	0.0	0.0	70.6	0.0	23.1	1.9	0.0	25.0	100.0
PHF	1.00	1.00	1.00			0.98	0.98	0.98			0.88	0.88	0.88			1.00	1.00	1.00			0.91



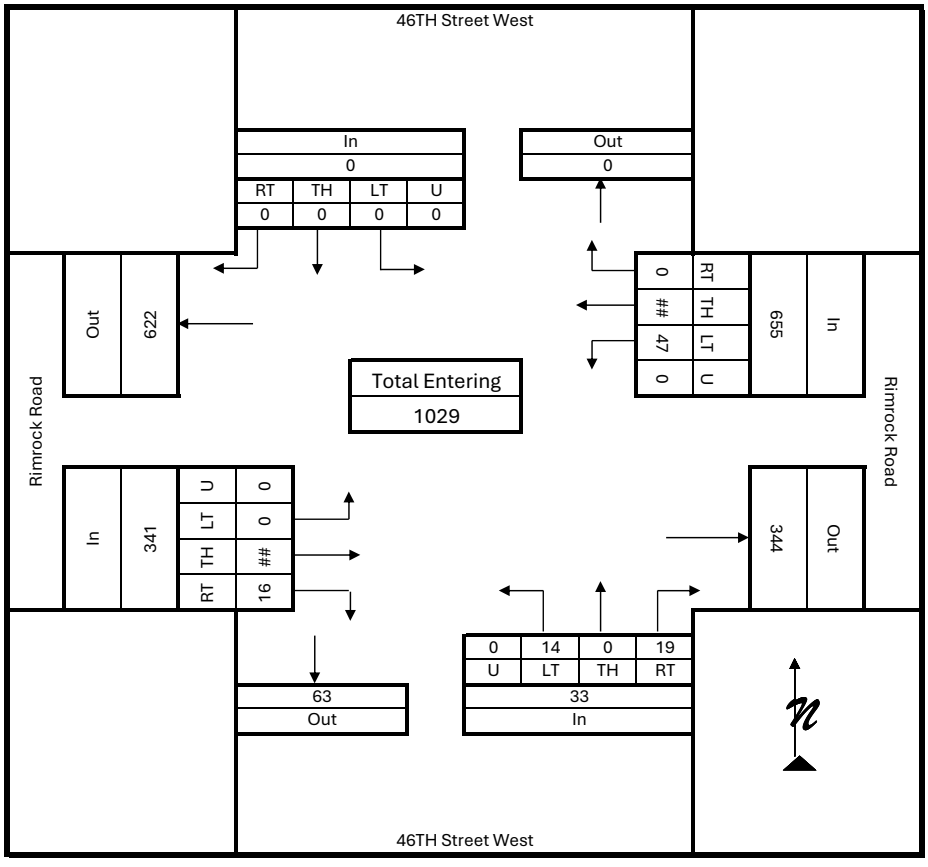
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 46TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	46TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	46TH Street West Southbound					46TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	0	0	0	0	0	3	0	4	0	7	3	76	0	0	79	0	148	8	0	156	242
5:00 PM	0	0	0	0	0	8	0	3	0	11	6	85	0	0	91	0	132	7	0	139	241
5:15 PM	0	0	0	0	0	3	0	3	0	6	6	83	0	0	89	0	168	22	0	190	285
5:30 PM	0	0	0	0	0	5	0	4	0	9	1	81	0	0	82	0	160	10	0	170	261
Grand Total	0	0	0	0	0	19	0	14	0	33	16	325	0	0	341	0	608	47	0	655	1029
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	3.0	0.0	1.2	0.0	0.0	1.2	0.0	0.2	0.0	0.0	0.2	
Total Truck %	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	3.0	0.0	1.2	0.0	0.0	1.2	0.0	0.2	0.0	0.0	0.2	
Total %	0.0	0.0	0.0	0.0	0.0	1.8	0.0	1.4	0.0	3.2	1.6	31.6	0.0	0.0	33.1	0.0	59.1	4.6	0.0	63.7	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			0.96	0.96	0.96			0.86	0.86	0.86			0.90



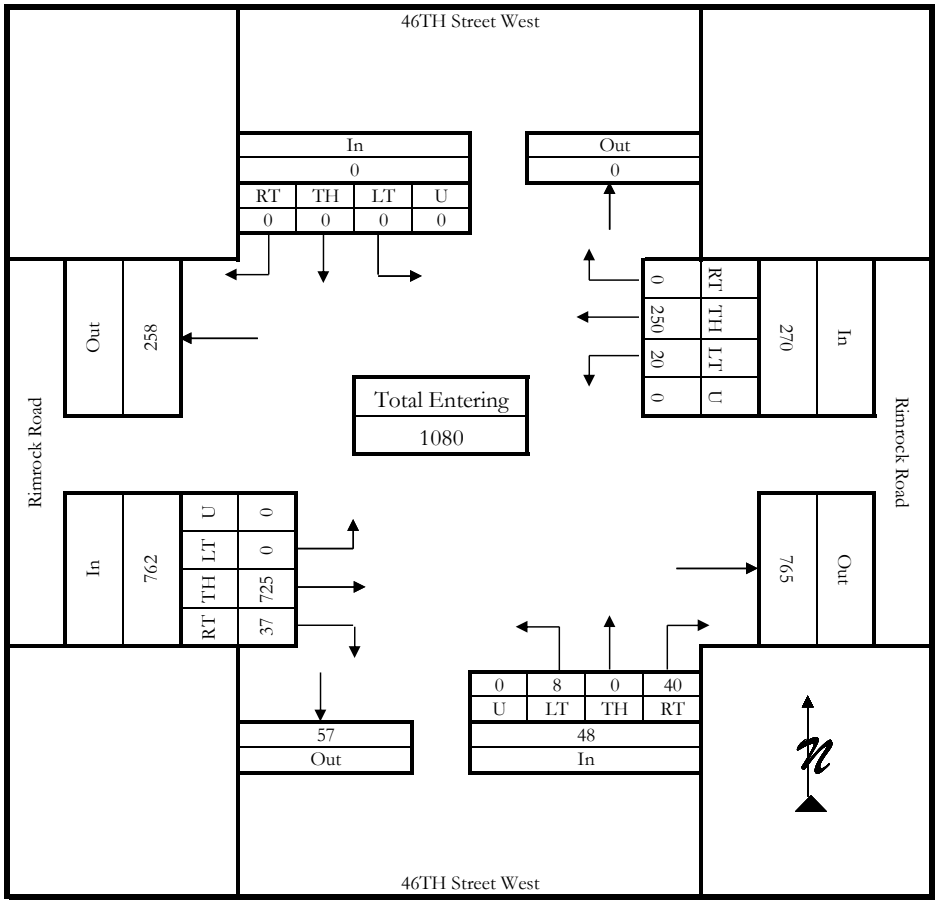
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 46TH ST West
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	46TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	46TH Street West Southbound					46TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	0	0	0	0	7	0	1	0	8	1	183	0	0	184	0	41	3	0	44	236
7:30 AM	0	0	0	0	0	10	0	2	0	12	4	212	0	0	216	0	63	3	0	66	294
7:45 AM	0	0	0	0	0	14	0	4	0	18	18	157	0	0	175	0	70	6	0	76	269
8:00 AM	0	0	0	0	0	9	0	1	0	10	14	173	0	0	187	0	76	8	0	84	281
Grand Total	0	0	0	0	0	40	0	8	0	48	37	725	0	0	762	0	250	20	0	270	1080
Medium Truck %	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.1	2.7	1.5	0.0	0.0	1.6	0.0	2.0	0.0	0.0	1.9	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	1.2	0.0	0.0	1.1	
Total Truck %	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.1	2.7	1.7	0.0	0.0	1.7	0.0	3.2	0.0	0.0	3.0	
Total %	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.7	0.0	4.4	3.4	67.1	0.0	0.0	70.6	0.0	23.1	1.9	0.0	25.0	100.0
PHF	1.00	1.00	1.00			0.98	0.98	0.98			0.88	0.88	0.88			1.00	1.00	1.00			0.91



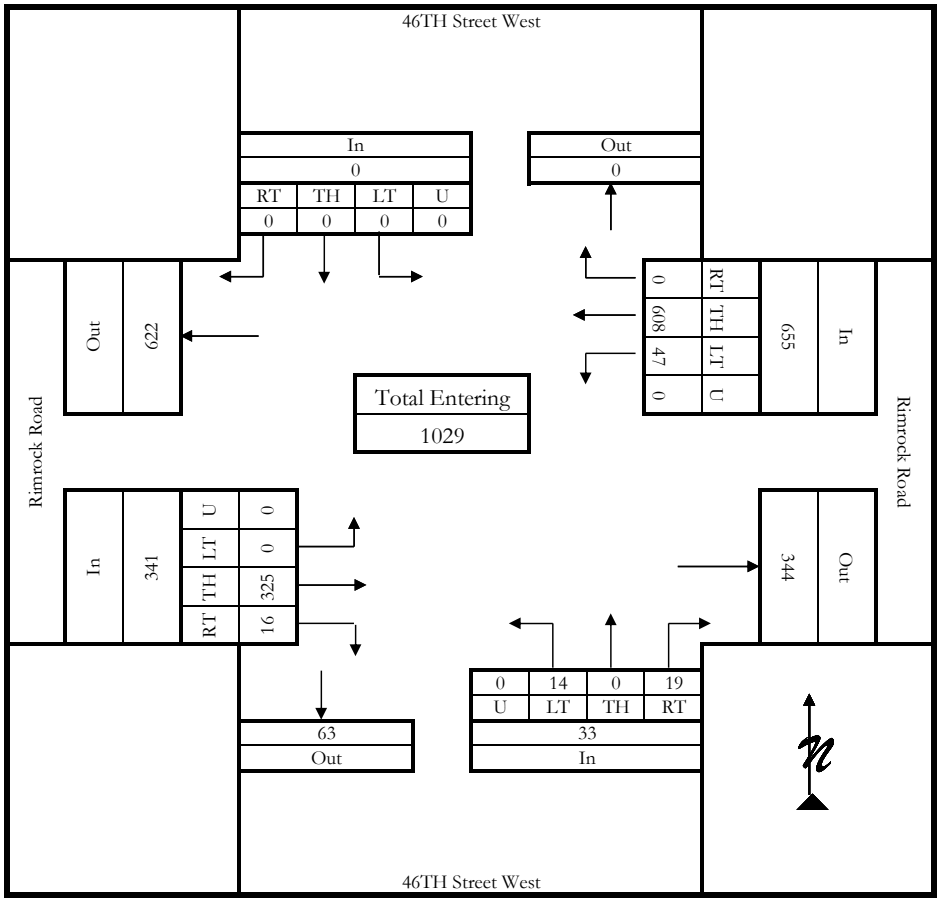
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 46TH ST West
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	46TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	46TH Street West Southbound					46TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	0	0	0	0	0	3	0	4	0	7	3	76	0	0	79	0	148	8	0	156	242
5:00 PM	0	0	0	0	0	8	0	3	0	11	6	85	0	0	91	0	132	7	0	139	241
5:15 PM	0	0	0	0	0	3	0	3	0	6	6	83	0	0	89	0	168	22	0	190	285
5:30 PM	0	0	0	0	0	5	0	4	0	9	1	81	0	0	82	0	160	10	0	170	261
Grand Total	0	0	0	0	0	19	0	14	0	33	16	325	0	0	341	0	608	47	0	655	1029
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	3.0	0.0	1.2	0.0	0.0	1.2	0.0	0.2	0.0	0.0	0.2	
Total Truck %	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	3.0	0.0	1.2	0.0	0.0	1.2	0.0	0.2	0.0	0.0	0.2	
Total %	0.0	0.0	0.0	0.0	0.0	1.8	0.0	1.4	0.0	3.2	1.6	31.6	0.0	0.0	33.1	0.0	59.1	4.6	0.0	63.7	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			0.96	0.96	0.96			0.86	0.86	0.86			0.90



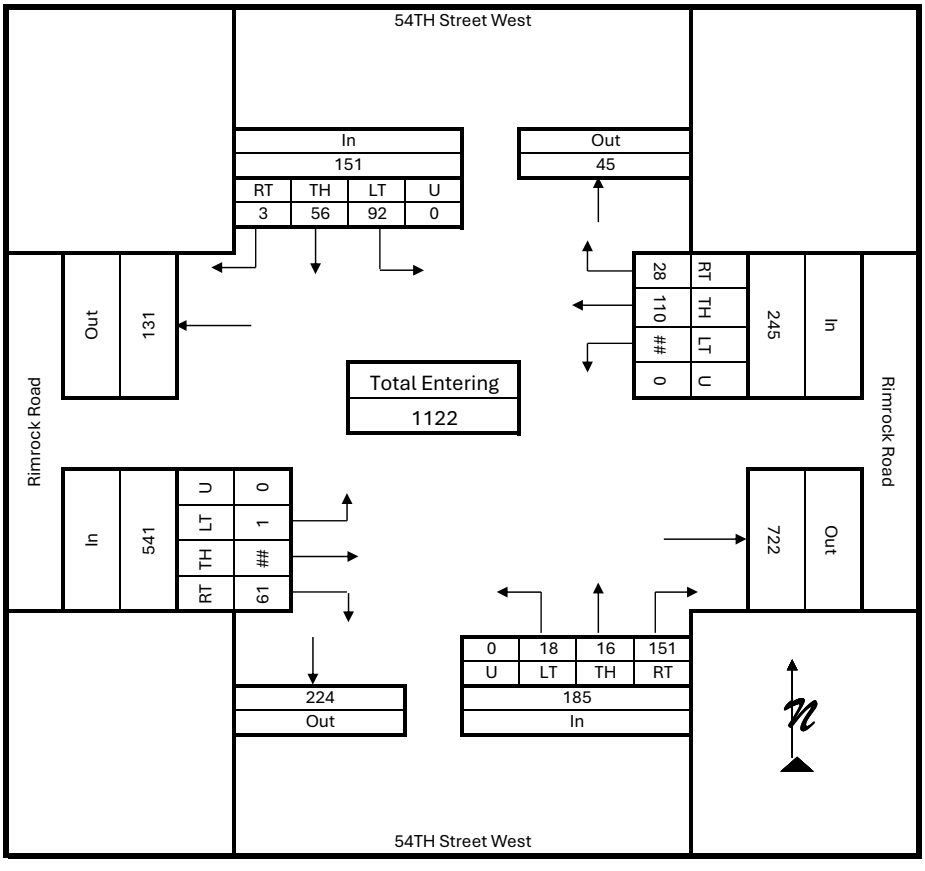
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 54TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	54TH Street West Southbound					54TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	11	22	0	33	28	1	2	0	31	16	134	1	0	151	7	10	18	0	35	250
7:30 AM	1	15	25	0	41	41	1	3	0	45	16	147	0	0	163	7	23	32	0	62	311
7:45 AM	1	23	24	0	48	47	8	4	0	59	18	119	0	0	137	5	33	37	0	75	319
8:00 AM	1	7	21	0	29	35	6	9	0	50	11	79	0	0	90	9	44	20	0	73	242
Grand Total	3	56	92	0	151	151	16	18	0	185	61	479	1	0	541	28	110	107	0	245	1122
Medium Truck %	0.0	0.0	3.3	0.0	2.0	0.7	0.0	0.0	0.0	0.5	0.0	1.9	100.0	0.0	1.8	3.6	2.7	0.0	0.0	1.6	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.5	0.0	0.2	0.0	0.0	0.2	7.1	0.9	1.9	0.0	2.0	
Total Truck %	0.0	0.0	3.3	0.0	2.0	0.7	0.0	5.6	0.0	1.1	0.0	2.1	100.0	0.0	2.0	10.7	3.6	1.9	0.0	3.7	
Total %	0.3	5.0	8.2	0.0	13.5	13.5	1.4	1.6	0.0	16.5	5.4	42.7	0.1	0.0	48.2	2.5	9.8	9.5	0.0	21.8	100.0
PHF	0.79	0.79	0.79			0.79	0.79	0.79			0.99	0.99	0.99			0.81	0.81	0.81			0.88



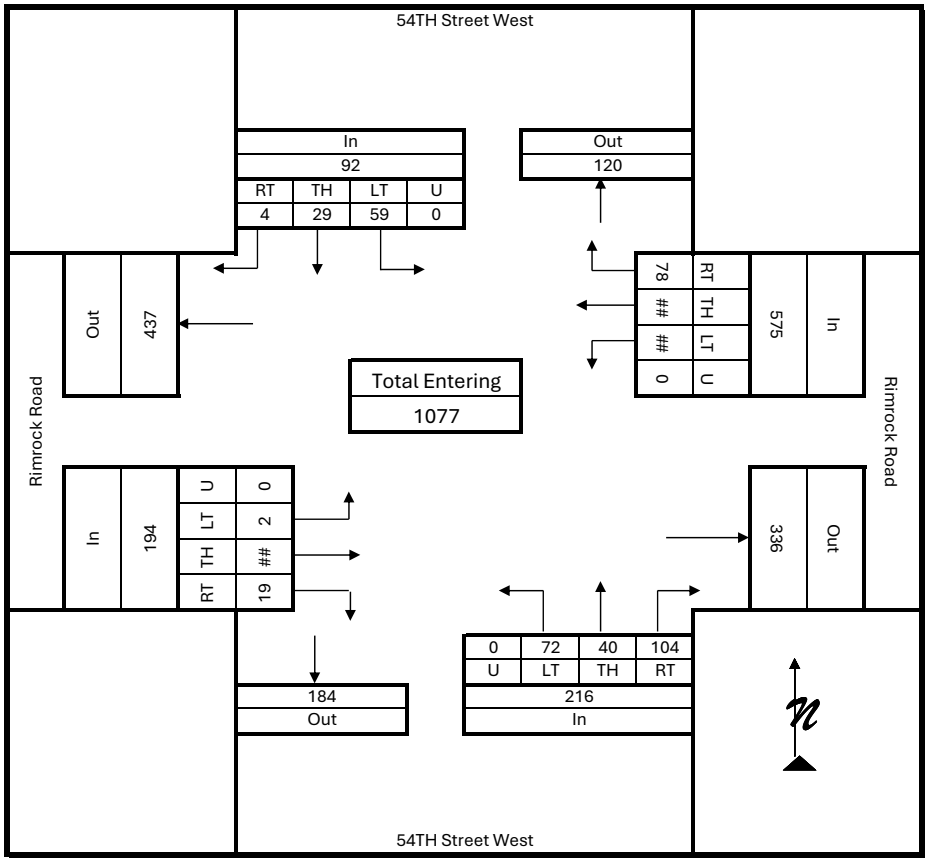
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 54TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	54TH Street West Southbound					54TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	1	10	15	0	26	19	5	22	0	46	4	50	1	0	55	23	79	35	0	137	264
5:00 PM	0	7	11	0	18	26	12	17	0	55	8	46	1	0	55	19	85	30	0	134	262
5:15 PM	2	2	12	0	16	31	14	17	0	62	6	40	0	0	46	12	104	36	0	152	276
5:30 PM	1	10	21	0	32	28	9	16	0	53	1	37	0	0	38	24	93	35	0	152	275
Grand Total	4	29	59	0	92	104	40	72	0	216	19	173	2	0	194	78	361	136	0	575	1077
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	3.4	0.0	2.2	2.9	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	3.4	0.0	2.2	2.9	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.4	2.7	5.5	0.0	8.5	9.7	3.7	6.7	0.0	20.1	1.8	16.1	0.2	0.0	18.0	7.2	33.5	12.6	0.0	53.4	100.0
PHF	1.00	1.00	1.00			0.88	0.88	0.88			1.00	1.00	1.00			0.94	0.94	0.94			0.98



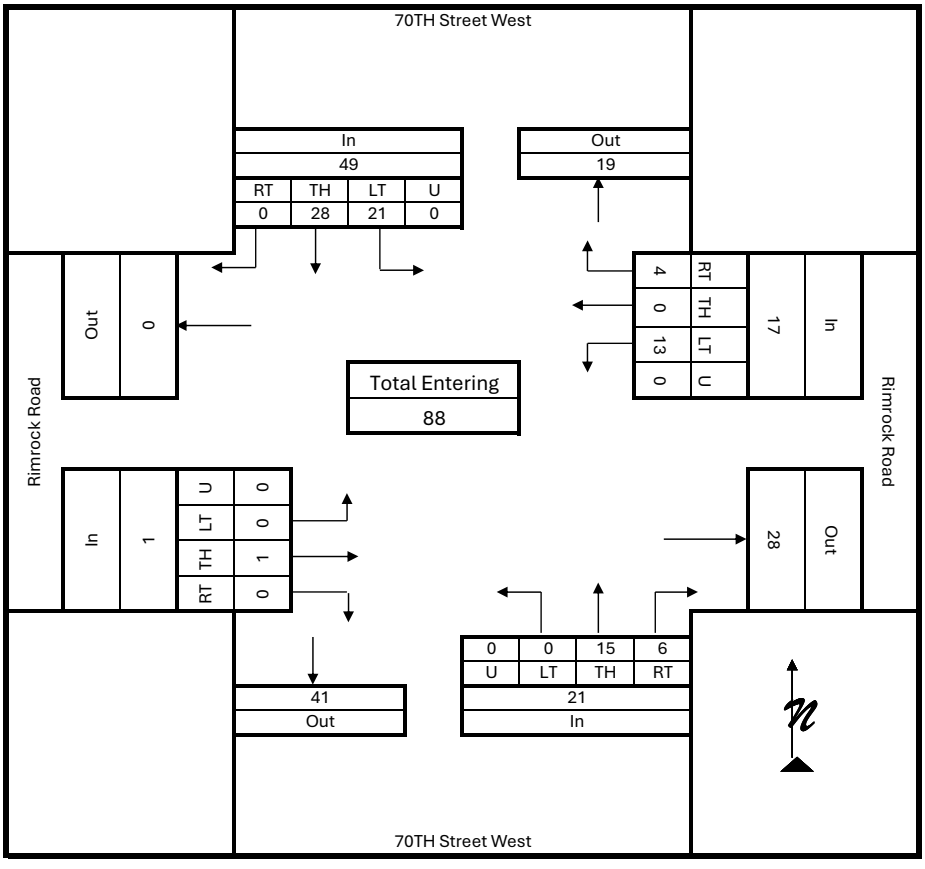
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 70TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	70TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	70TH Street West Southbound					70TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	6	5	0	11	0	2	0	0	2	0	0	0	0	0	0	0	2	0	2	15
7:30 AM	0	11	7	0	18	2	3	0	0	5	0	1	0	0	1	1	0	8	0	9	33
7:45 AM	0	6	5	0	11	3	4	0	0	7	0	0	0	0	0	2	0	2	0	4	22
8:00 AM	0	5	4	0	9	1	6	0	0	7	0	0	0	0	0	1	0	1	0	2	18
Grand Total	0	28	21	0	49	6	15	0	0	21	0	1	0	0	1	4	0	13	0	17	88
Medium Truck %	0.0	3.6	0.0	0.0	2.0	16.7	6.7	0.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	5.9	
Total Truck %	0.0	3.6	0.0	0.0	2.0	16.7	13.3	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	5.9	
Total %	0.0	31.8	23.9	0.0	55.7	6.8	17.0	0.0	0.0	23.9	0.0	1.1	0.0	0.0	1.1	4.5	0.0	14.8	0.0	19.3	100.0
PHF	0.68	0.68	0.68			1.00	1.00	1.00			0.25	0.25	0.25			0.47	0.47	0.47			0.67



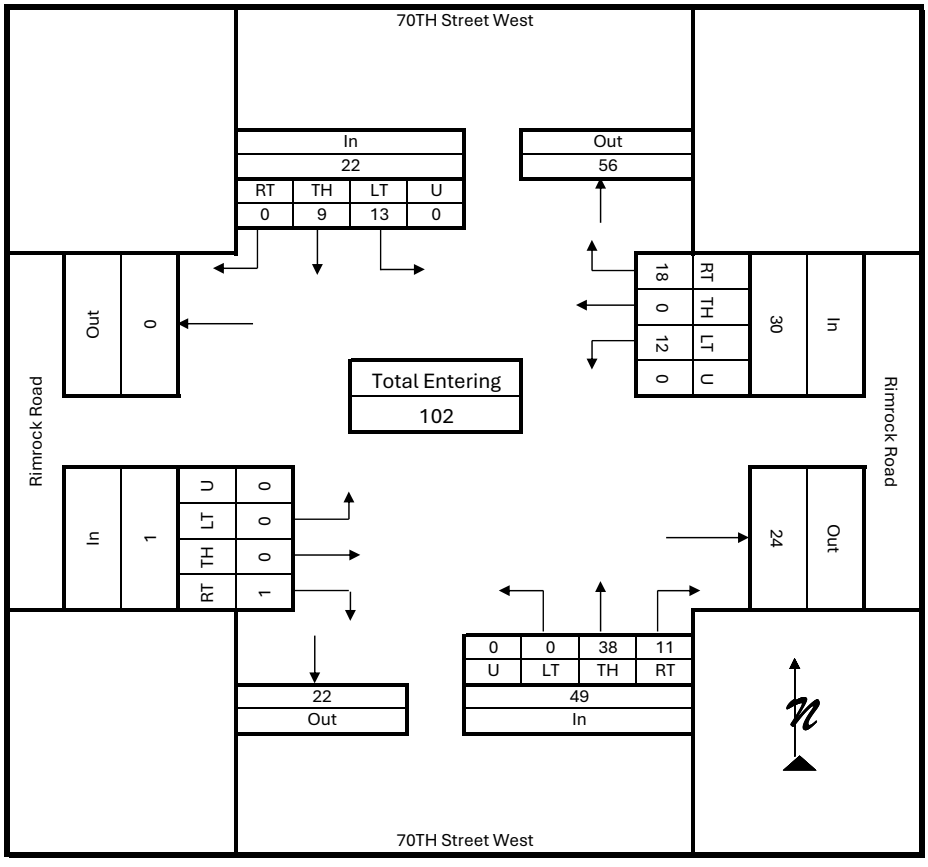
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 70TH ST West
Agency/Company:	Sanbell		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	70TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	70TH Street West Southbound					70TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	0	2	3	0	5	5	5	0	0	10	1	0	0	0	1	3	0	4	0	7	23
5:00 PM	0	2	2	0	4	2	8	0	0	10	0	0	0	0	0	2	0	1	0	3	17
5:15 PM	0	3	3	0	6	2	9	0	0	11	0	0	0	0	0	3	0	2	0	5	22
5:30 PM	0	2	5	0	7	2	16	0	0	18	0	0	0	0	0	10	0	5	0	15	40
Grand Total	0	9	13	0	22	11	38	0	0	49	1	0	0	0	1	18	0	12	0	30	102
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	8.8	12.7	0.0	21.6	10.8	37.3	0.0	0.0	48.0	1.0	0.0	0.0	0.0	1.0	17.6	0.0	11.8	0.0	29.4	100.0
PHF	0.79	0.79	0.79			0.71	0.71	0.71			1.00	1.00	1.00			0.50	0.50	0.50			0.65



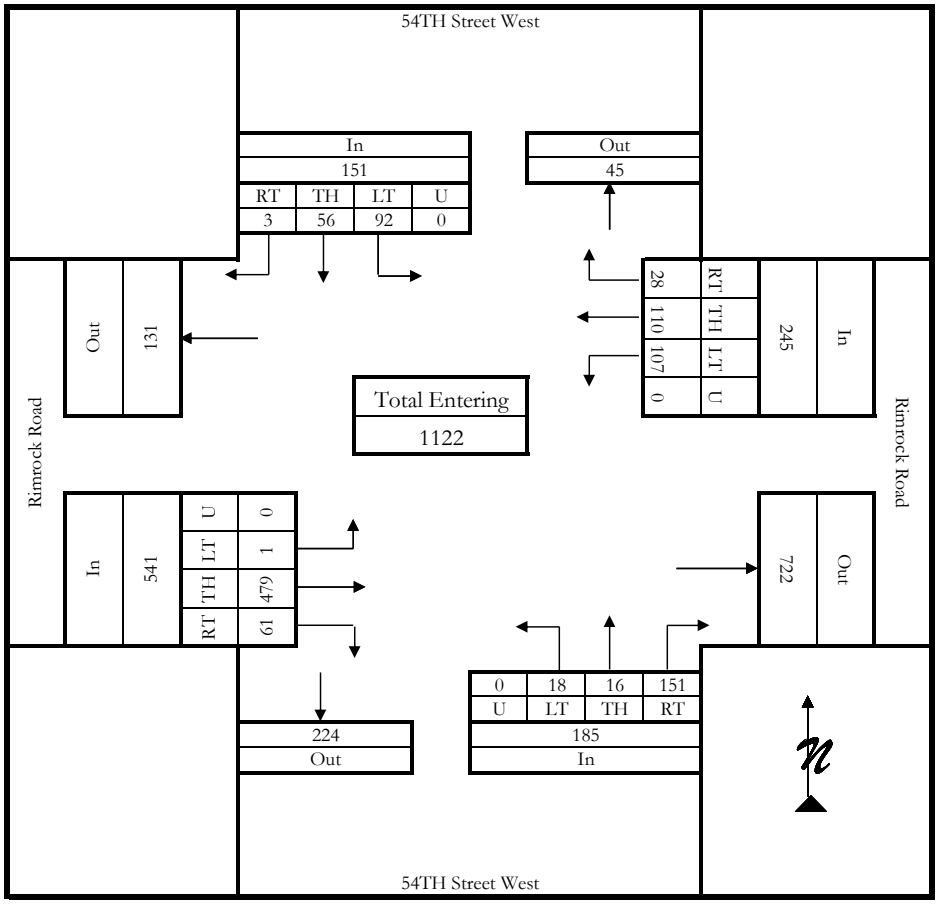
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 54TH ST West
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	54TH Street West Southbound					54TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
7:15 AM	0	11	22	0	33	28	1	2	0	31	16	134	1	0	151	7	10	18	0	35	250
7:30 AM	1	15	25	0	41	41	1	3	0	45	16	147	0	0	163	7	23	32	0	62	311
7:45 AM	1	23	24	0	48	47	8	4	0	59	18	119	0	0	137	5	33	37	0	75	319
8:00 AM	1	7	21	0	29	35	6	9	0	50	11	79	0	0	90	9	44	20	0	73	242
Grand Total	3	56	92	0	151	151	16	18	0	185	61	479	1	0	541	28	110	107	0	245	1122
Medium Truck %	0.0	0.0	3.3	0.0	2.0	0.7	0.0	0.0	0.0	0.5	0.0	1.9	100.0	0.0	1.8	3.6	2.7	0.0	0.0	1.6	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.5	0.0	0.2	0.0	0.0	0.2	7.1	0.9	1.9	0.0	2.0	
Total Truck %	0.0	0.0	3.3	0.0	2.0	0.7	0.0	5.6	0.0	1.1	0.0	2.1	100.0	0.0	2.0	10.7	3.6	1.9	0.0	3.7	
Total %	0.3	5.0	8.2	0.0	13.5	13.5	1.4	1.6	0.0	16.5	5.4	42.7	0.1	0.0	48.2	2.5	9.8	9.5	0.0	21.8	100.0
PHF	0.79	0.79	0.79			0.79	0.79	0.79			0.99	0.99	0.99			0.81	0.81	0.81			0.88



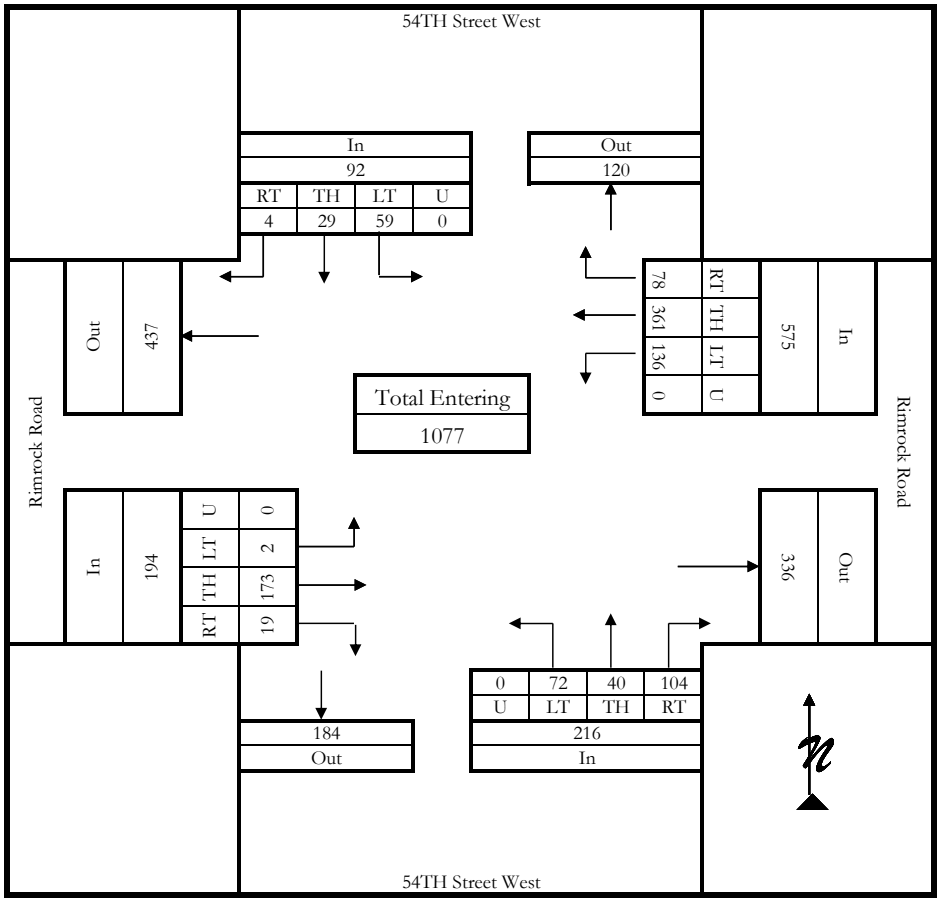
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Road & 54TH ST West
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, January 9, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	54TH Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	54TH Street West Southbound					54TH Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		1.04	1.04	1.04	1.04		
4:45 PM	1	10	15	0	26	19	5	22	0	46	4	50	1	0	55	23	79	35	0	137	264
5:00 PM	0	7	11	0	18	26	12	17	0	55	8	46	1	0	55	19	85	30	0	134	262
5:15 PM	2	2	12	0	16	31	14	17	0	62	6	40	0	0	46	12	104	36	0	152	276
5:30 PM	1	10	21	0	32	28	9	16	0	53	1	37	0	0	38	24	93	35	0	152	275
Grand Total	4	29	59	0	92	104	40	72	0	216	19	173	2	0	194	78	361	136	0	575	1077
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	3.4	0.0	2.2	2.9	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	3.4	0.0	2.2	2.9	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.4	2.7	5.5	0.0	8.5	9.7	3.7	6.7	0.0	20.1	1.8	16.1	0.2	0.0	18.0	7.2	33.5	12.6	0.0	53.4	100.0
PHF	1.00	1.00	1.00			0.88	0.88	0.88			1.00	1.00	1.00			0.94	0.94	0.94			0.98



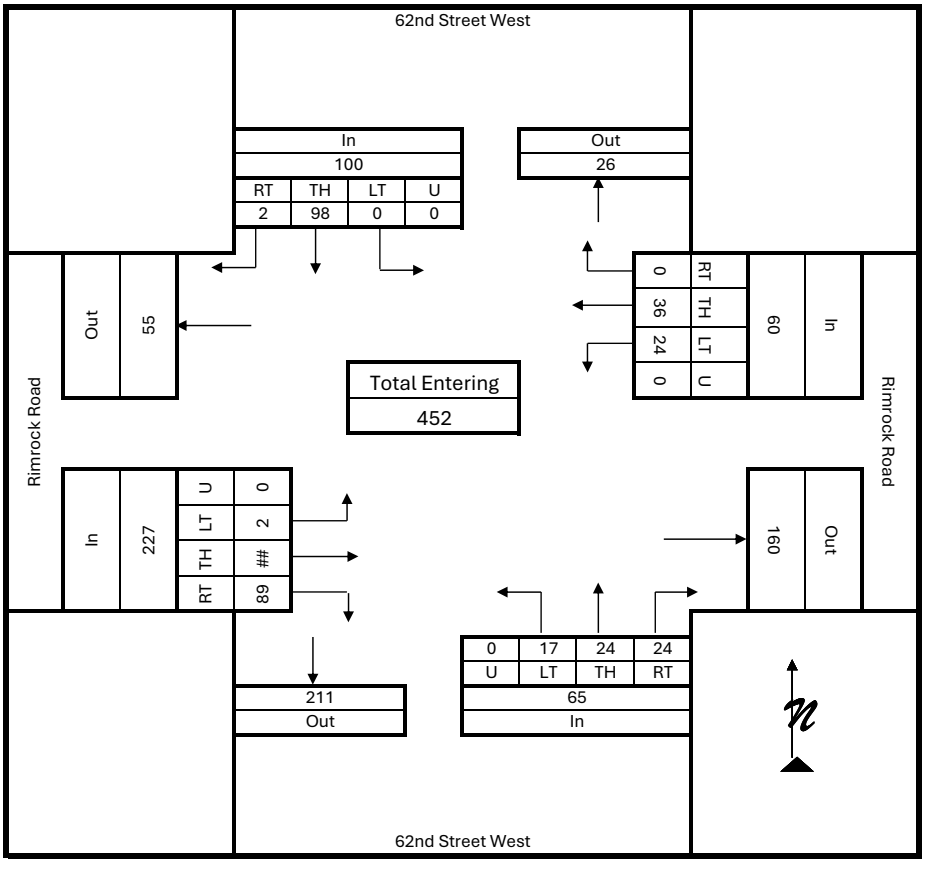
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Rd & 62nd St W - South Leg
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
7:15 AM	0	11	0	0	11	11	3	2	0	16	26	41	1	0	68	0	2	3	0	5	100
7:30 AM	1	24	0	0	25	3	2	4	0	9	34	34	1	0	69	0	7	8	0	15	118
7:45 AM	1	39	0	0	40	7	7	7	0	21	17	27	0	0	44	0	13	9	0	22	127
8:00 AM	0	24	0	0	24	3	12	4	0	19	12	34	0	0	46	0	14	4	0	18	107
Grand Total	2	98	0	0	100	24	24	17	0	65	89	136	2	0	227	0	36	24	0	60	452
Medium Truck %	0.0	1.0	0.0	0.0	1.0	0.0	0.0	11.8	0.0	3.1	0.0	2.2	0.0	0.0	1.3	0.0	5.6	0.0	0.0	3.3	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	4.2	16.7	0.0	0.0	7.7	1.1	0.7	0.0	0.0	0.9	0.0	11.1	4.2	0.0	8.3	
Total Truck %	0.0	1.0	0.0	0.0	1.0	4.2	16.7	11.8	0.0	10.8	1.1	2.9	0.0	0.0	2.2	0.0	16.7	4.2	0.0	11.7	
Total %	0.4	21.7	0.0	0.0	22.1	5.3	5.3	3.8	0.0	14.4	19.7	30.1	0.4	0.0	50.2	0.0	8.0	5.3	0.0	13.3	100.0
PHF	0.63	0.63	0.63			0.77	0.77	0.77			1.00	1.00	1.00			0.68	0.68	0.68			0.89



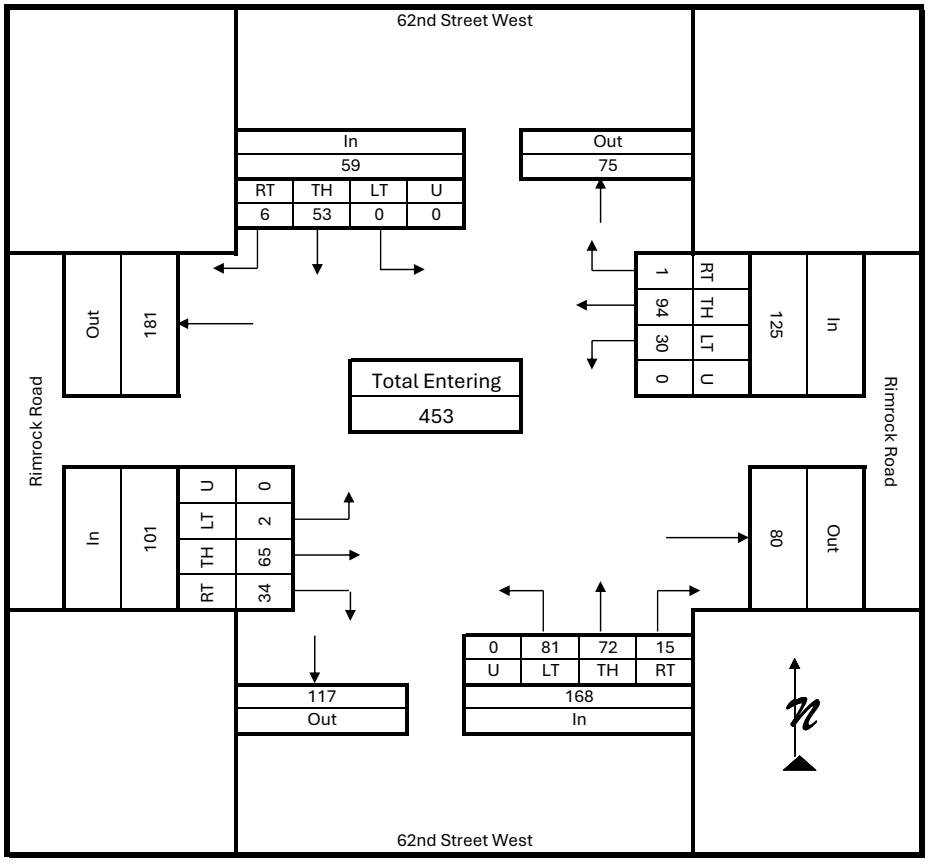
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Rd & 62nd St W - South Leg
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
4:45 PM	1	13	0	0	14	1	15	18	0	34	9	17	1	0	27	1	23	11	0	35	110
5:00 PM	0	13	0	0	13	8	24	19	0	51	12	18	0	0	30	0	23	6	0	29	123
5:15 PM	5	12	0	0	17	3	14	20	0	37	7	15	0	0	22	0	28	8	0	36	112
5:30 PM	0	15	0	0	15	3	19	24	0	46	6	15	1	0	22	0	20	5	0	25	108
Grand Total	6	53	0	0	59	15	72	81	0	168	34	65	2	0	101	1	94	30	0	125	453
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	
Total %	1.3	11.7	0.0	0.0	13.0	3.3	15.9	17.9	0.0	37.1	7.5	14.3	0.4	0.0	22.3	0.2	20.8	6.6	0.0	27.6	100.0
PHF	1.00	1.00	1.00			0.82	0.82	0.82			0.84	0.84	0.84			1.00	1.00	1.00			0.92



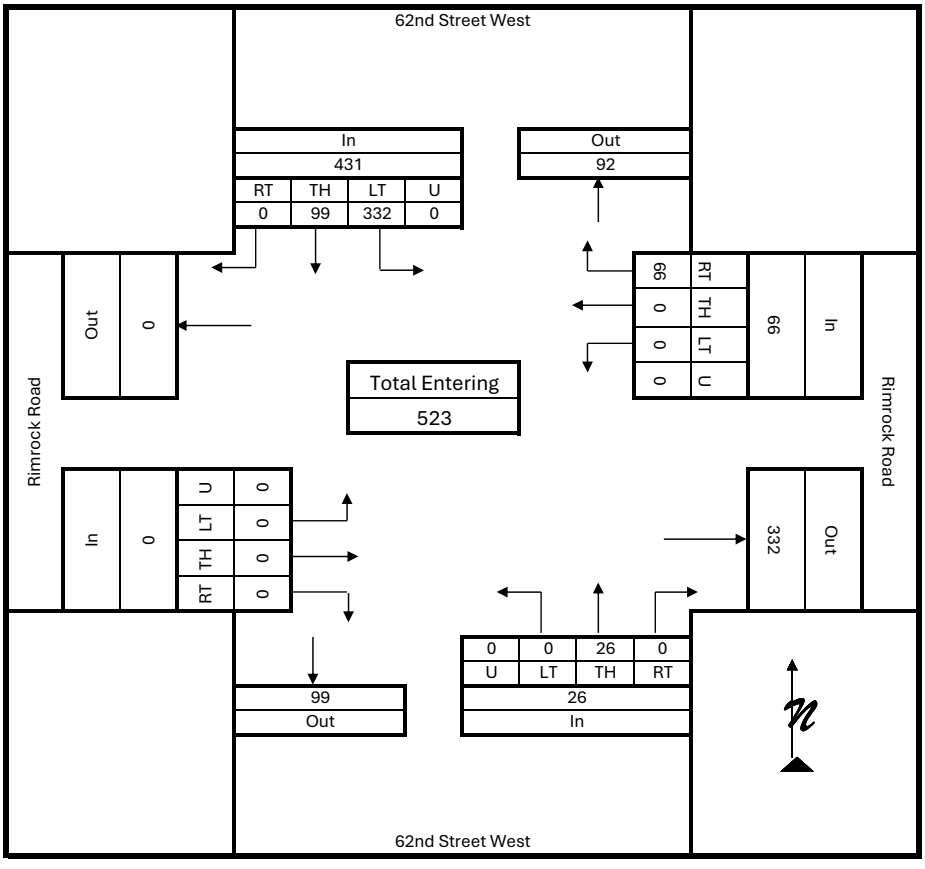
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Rd & 62nd St W - North Leg
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
7:15 AM	0	12	91	0	103	0	4	0	0	4	0	0	0	0	0	7	0	0	0	7	114
7:30 AM	0	24	88	0	112	0	3	0	0	3	0	0	0	0	0	16	0	0	0	16	131
7:45 AM	0	39	80	0	119	0	7	0	0	7	0	0	0	0	0	12	0	0	0	12	138
8:00 AM	0	24	73	0	97	0	12	0	0	12	0	0	0	0	0	31	0	0	0	31	140
Grand Total	0	99	332	0	431	0	26	0	0	26	0	0	0	0	0	66	0	0	0	66	523
Medium Truck %	0.0	1.0	2.1	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	4.5	
Heavy Truck %	0.0	1.0	0.0	0.0	0.2	0.0	11.5	0.0	0.0	11.5	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	0.0	6.1	
Total Truck %	0.0	2.0	2.1	0.0	2.1	0.0	11.5	0.0	0.0	11.5	0.0	0.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	10.6	
Total %	0.0	18.9	63.5	0.0	82.4	0.0	5.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	12.6	0.0	0.0	0.0	12.6	100.0
PHF	1.00	1.00	1.00			0.54	0.54	0.54			1.00	1.00	1.00			0.53	0.53	0.53			0.93



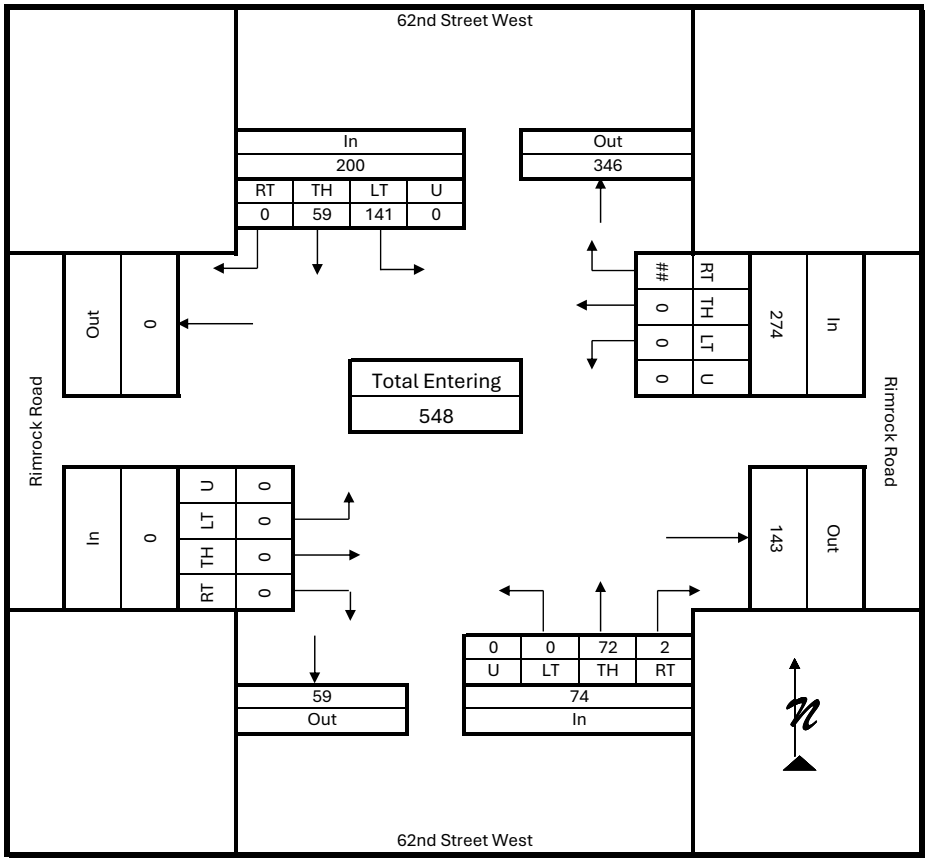
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Rd & 62nd St W - North Leg
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
4:45 PM	0	14	41	0	55	1	16	0	0	17	0	0	0	0	0	68	0	0	0	68	140
5:00 PM	0	13	36	0	49	1	20	0	0	21	0	0	0	0	0	64	0	0	0	64	134
5:15 PM	0	17	30	0	47	0	16	0	0	16	0	0	0	0	0	77	0	0	0	77	140
5:30 PM	0	15	34	0	49	0	20	0	0	20	0	0	0	0	0	65	0	0	0	65	134
Grand Total	0	59	141	0	200	2	72	0	0	74	0	0	0	0	0	274	0	0	0	274	548
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	10.8	25.7	0.0	36.5	0.4	13.1	0.0	0.0	13.5	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0	100.0
PHF	0.91	0.91	0.91			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			0.98



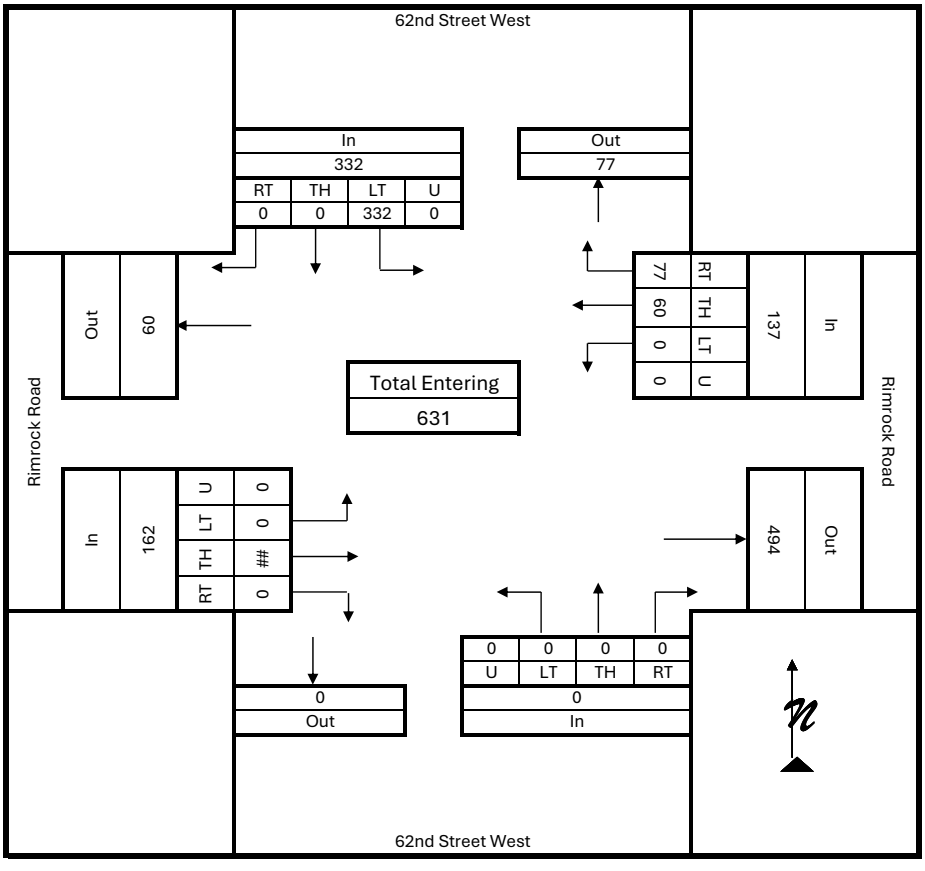
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Rd & 62nd St W - East Leg
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
7:15 AM	0	0	92	0	92	0	0	0	0	0	0	54	0	0	54	9	4	0	0	13	159
7:30 AM	0	0	87	0	87	0	0	0	0	0	0	36	0	0	36	20	15	0	0	35	158
7:45 AM	0	0	80	0	80	0	0	0	0	0	0	35	0	0	35	15	23	0	0	38	153
8:00 AM	0	0	73	0	73	0	0	0	0	0	0	37	0	0	37	33	18	0	0	51	161
Grand Total	0	0	332	0	332	0	0	0	0	0	0	162	0	0	162	77	60	0	0	137	631
Medium Truck %	0.0	0.0	2.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	1.9	3.9	3.3	0.0	0.0	3.6	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2	6.5	8.3	0.0	0.0	7.3	
Total Truck %	0.0	0.0	2.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	3.1	10.4	11.7	0.0	0.0	10.9	
Total %	0.0	0.0	52.6	0.0	52.6	0.0	0.0	0.0	0.0	0.0	0.0	25.7	0.0	0.0	25.7	12.2	9.5	0.0	0.0	21.7	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			0.67	0.67	0.67			0.98



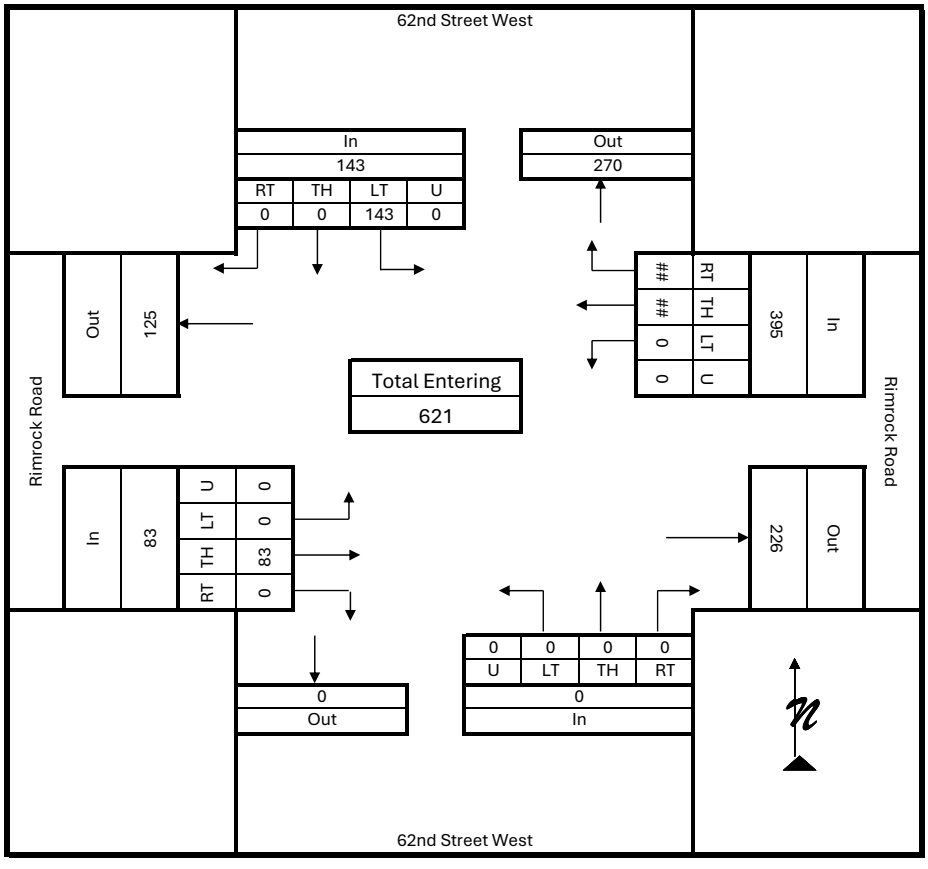
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Rd & 62nd St W - East Leg
Agency/Company:	Sanbell		
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
4:45 PM	0	0	43	0	43	0	0	0	0	0	0	19	0	0	19	69	35	0	0	104	166
5:00 PM	0	0	37	0	37	0	0	0	0	0	0	24	0	0	24	63	30	0	0	93	154
5:15 PM	0	0	28	0	28	0	0	0	0	0	0	21	0	0	21	74	35	0	0	109	158
5:30 PM	0	0	35	0	35	0	0	0	0	0	0	19	0	0	19	64	25	0	0	89	143
Grand Total	0	0	143	0	143	0	0	0	0	0	0	83	0	0	83	270	125	0	0	395	621
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	0.0	23.0	0.0	23.0	0.0	0.0	0.0	0.0	0.0	0.0	13.4	0.0	0.0	13.4	43.5	20.1	0.0	0.0	63.6	100.0
PHF	0.83	0.83	0.83			1.00	1.00	1.00			1.00	1.00	1.00			0.95	0.95	0.95			0.93



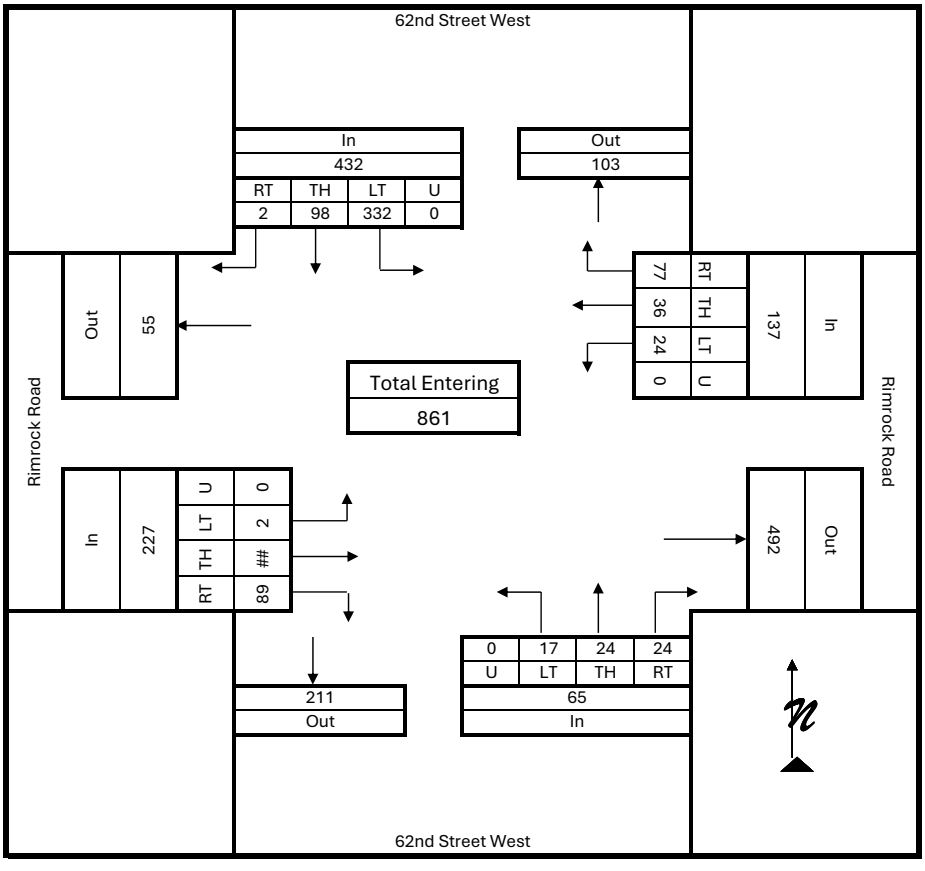
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Rd & 62nd St W - Combined
Agency/Company:	Sanbell		Manually mapulated to show one single intersection
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
7:15 AM	0	11	91	0	102	11	3	2	0	16	26	41	1	0	68	9	2	3	0	14	200
7:30 AM	1	24	88	0	113	3	2	4	0	9	34	34	1	0	69	20	7	8	0	35	226
7:45 AM	1	39	80	0	120	7	7	7	0	21	17	27	0	0	44	15	13	9	0	37	222
8:00 AM	0	24	73	0	97	3	12	4	0	19	12	34	0	0	46	33	14	4	0	51	213
Grand Total	2	98	332	0	432	24	24	17	0	65	89	136	2	0	227	77	36	24	0	137	861
Medium Truck %	0.0	1.0	2.1	0.0	1.9	0.0	0.0	11.8	0.0	3.1	0.0	2.2	0.0	0.0	1.3	3.9	5.6	0.0	0.0	3.6	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	4.2	16.7	0.0	0.0	7.7	1.1	0.7	0.0	0.0	0.9	6.5	11.1	4.2	0.0	7.3	
Total Truck %	0.0	1.0	2.1	0.0	1.9	4.2	16.7	11.8	0.0	10.8	1.1	2.9	0.0	0.0	2.2	10.4	16.7	4.2	0.0	10.9	
Total %	0.2	11.4	38.6	0.0	50.2	2.8	2.8	2.0	0.0	7.5	10.3	15.8	0.2	0.0	26.4	8.9	4.2	2.8	0.0	15.9	100.0
PHF	0.96	0.96	0.96			1.00	1.00	1.00			0.82	0.82	0.82			0.98	0.98	0.98			0.95



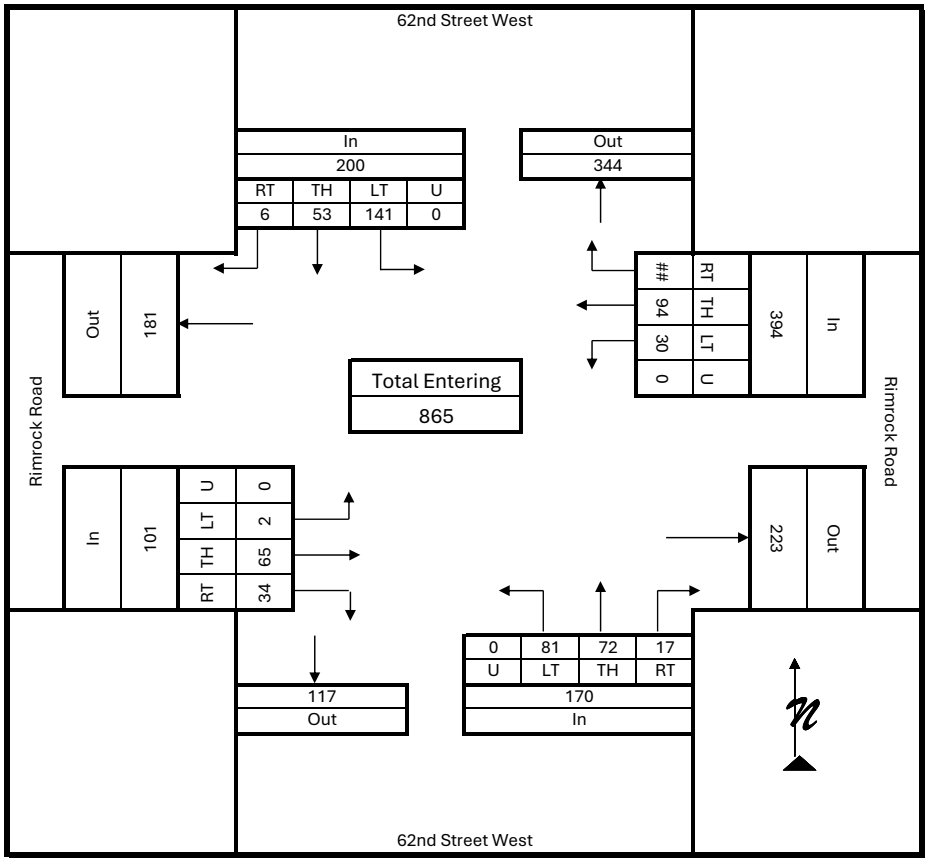
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Rafael Teixeira	Intersection:	Rimrock Rd & 62nd St W - Combined
Agency/Company:	Sanbell		Manually mapulated to show one single intersection
Date Performed:	Thursday, February 8, 2024	Jurisdiction:	City of Billings, MT / MDT
Count Time Period:	PM Peak Hour (4:45 - 5:45 PM)		
Project Number:	23379	Project Description:	West Billings Neighborhood Plan
North/South Street:	62nd Street West	East/West Street:	Rimrock Road

Vehicle Volumes and Adjustments

	62nd Street West Southbound					62nd Street West Northbound					Rimrock Road Eastbound					Rimrock Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		1.01	1.01	1.01	1.01		
4:45 PM	1	13	41	0	55	2	15	18	0	35	9	17	1	0	27	69	23	11	0	103	220
5:00 PM	0	13	36	0	49	9	24	19	0	52	12	18	0	0	30	63	23	6	0	92	223
5:15 PM	5	12	30	0	47	3	14	20	0	37	7	15	0	0	22	74	28	8	0	110	216
5:30 PM	0	15	34	0	49	3	19	24	0	46	6	15	1	0	22	64	20	5	0	89	206
Grand Total	6	53	141	0	200	17	72	81	0	170	34	65	2	0	101	270	94	30	0	394	865
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.7	6.1	16.3	0.0	23.1	2.0	8.3	9.4	0.0	19.7	3.9	7.5	0.2	0.0	11.7	31.2	10.9	3.5	0.0	45.5	100.0
PHF	1.00	1.00	1.00			0.82	0.82	0.82			0.84	0.84	0.84			1.00	1.00	1.00			0.97



APPENDIX D

EXISTING CONDITIONS (2025) CAPACITY CALCULATIONS

Appendix D Contents

Existing Conditions (2025) Capacity Calculations 318

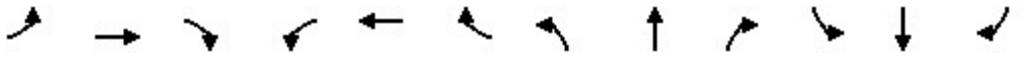
Existing Conditions (2025) Capacity Calculations

Existing AM Capacity:

Queues
2: 54th Street West & Rimrock Road 10/19/2025

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	546	132	136	35	23	211	116	75
v/c Ratio	0.00	0.64	0.30	0.13	0.04	0.11	0.49	0.78	0.24
Control Delay (s/veh)	7.0	21.2	8.2	8.9	0.1	29.7	10.3	66.8	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.0	21.2	8.2	8.9	0.1	29.7	10.3	66.8	30.4
Queue Length 50th (ft)	0	209	23	24	0	11	9	63	34
Queue Length 95th (ft)	4	394	52	74	0	28	44	105	61
Internal Link Dist (ft)		4323		924			5202		920
Turn Bay Length (ft)	250		250		250	200		150	
Base Capacity (vph)	377	857	455	1080	899	386	623	271	576
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.64	0.29	0.13	0.04	0.06	0.34	0.43	0.13

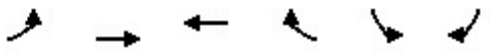
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	479	61	107	110	28	18	16	151	92	56	3
Future Volume (veh/h)	1	479	61	107	110	28	18	16	151	92	56	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	385	1723	1750	1723	1695	1600	1668	1750	1736	1709	1750	1750
Adj Flow Rate, veh/h	1	484	62	132	136	35	23	20	191	116	71	4
Peak Hour Factor	0.99	0.99	0.99	0.81	0.81	0.81	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	100	2	0	2	4	11	6	0	1	3	0	0
Cap, veh/h	210	716	92	375	911	729	352	35	336	223	405	23
Arrive On Green	0.00	0.48	0.48	0.06	0.54	0.54	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	367	1496	192	1641	1695	1356	1283	143	1362	1161	1641	92
Grp Volume(v), veh/h	1	0	546	132	136	35	23	0	211	116	0	75
Grp Sat Flow(s),veh/h/ln	367	0	1688	1641	1695	1356	1283	0	1505	1161	0	1733
Q Serve(g_s), s	0.1	0.0	22.6	3.6	3.7	1.1	1.3	0.0	11.2	8.8	0.0	3.1
Cycle Q Clear(g_c), s	0.1	0.0	22.6	3.6	3.7	1.1	4.4	0.0	11.2	20.0	0.0	3.1
Prop In Lane	1.00		0.11	1.00		1.00	1.00		0.91	1.00		0.05
Lane Grp Cap(c), veh/h	210	0	808	375	911	729	352	0	371	223	0	427
V/C Ratio(X)	0.00	0.00	0.68	0.35	0.15	0.05	0.07	0.00	0.57	0.52	0.00	0.18
Avail Cap(c_a), veh/h	243	0	808	430	911	729	438	0	472	301	0	544
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	18.3	13.7	10.6	10.0	28.7	0.0	30.0	38.8	0.0	27.0
Incr Delay (d2), s/veh	0.0	0.0	4.5	0.6	0.3	0.1	0.1	0.0	1.4	1.9	0.0	0.2
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	0.0	0.0	8.4	1.2	1.3	0.3	0.4	0.0	3.9	2.6	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	12.3	0.0	22.8	14.2	10.9	10.1	28.8	0.0	31.4	40.6	0.0	27.2
LnGrp LOS	B		C	B	B	B	C		C	D		C
Approach Vol, veh/h		547			303			234			191	
Approach Delay, s/veh		22.7			12.3			31.1			35.3	
Approach LOS		C			B			C			D	

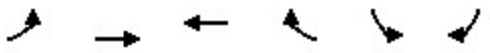
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	50.0		28.9	6.6	55.3		28.9				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	8.5	43.5		28.5	8.5	43.5		28.5				
Max Q Clear Time (g_c+I1), s	5.6	24.6		22.0	2.1	5.7		13.2				
Green Ext Time (p_c), s	0.1	2.9		0.4	0.0	0.8		1.0				

Intersection Summary		
HCM 7th Control Delay, s/veh	23.7	
HCM 7th LOS	C	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	148	558	212	82	257	166
v/c Ratio	0.20	0.49	0.27	0.07	0.75	0.24
Control Delay (s/veh)	6.8	10.7	17.5	1.0	49.1	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	6.8	10.7	17.5	1.0	49.1	3.4
Queue Length 50th (ft)	27	149	75	0	143	0
Queue Length 95th (ft)	46	186	144	10	224	30
Internal Link Dist (ft)		1579	3521		5202	
Turn Bay Length (ft)	400			400		250
Base Capacity (vph)	990	1688	783	1409	781	1172
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.33	0.27	0.06	0.33	0.14

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	102	385	180	70	221	143
Future Volume (veh/h)	102	385	180	70	221	143
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1736	1736	1668	1709	1736	1736
Adj Flow Rate, veh/h	148	558	212	82	257	166
Peak Hour Factor	0.69	0.69	0.85	0.85	0.86	0.86
Percent Heavy Veh, %	1	1	6	3	1	1
Cap, veh/h	707	1139	895	1052	313	373
Arrive On Green	0.06	0.66	0.54	0.54	0.19	0.19
Sat Flow, veh/h	1654	1736	1668	1448	1654	1471
Grp Volume(v), veh/h	148	558	212	82	257	166
Grp Sat Flow(s),veh/h/ln	1654	1736	1668	1448	1654	1471
Q Serve(g_s), s	3.0	13.3	5.5	1.3	12.1	7.7
Cycle Q Clear(g_c), s	3.0	13.3	5.5	1.3	12.1	7.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	707	1139	895	1052	313	373
V/C Ratio(X)	0.21	0.49	0.24	0.08	0.82	0.45
Avail Cap(c_a), veh/h	1526	1998	895	1052	887	884
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	6.7	7.1	10.0	3.2	31.7	25.6
Incr Delay (d2), s/veh	0.1	0.3	0.6	0.1	5.3	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	3.6	1.8	0.6	5.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	6.8	7.4	10.6	3.4	37.0	26.4
LnGrp LOS	A	A	B	A	D	C
Approach Vol, veh/h		706	294		423	
Approach Delay, s/veh		7.3	8.6		32.9	
Approach LOS		A	A		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		59.7		21.7	9.7	50.0
Change Period (Y+Rc), s		6.3		6.3	4.5	6.3
Max Green Setting (Gmax), s		93.7		43.7	45.5	43.7
Max Q Clear Time (g_c+I1), s		15.3		14.1	5.0	7.5
Green Ext Time (p_c), s		3.7		1.3	0.4	1.4

Intersection Summary	
HCM 7th Control Delay, s/veh	15.2
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	480	134	88	274	0	28	0	98	0	0	0
Future Vol, veh/h	0	480	134	88	274	0	28	0	98	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	200	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	93	93	93	66	66	66	100	100	100
Heavy Vehicles, %	0	1	4	8	3	0	11	0	9	0	0	0
Mvmt Flow	0	640	179	95	295	0	42	0	148	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	295	0	0	819	0	0	1213	1213	729	1124	1303	295
Stage 1	-	-	-	-	-	-	729	729	-	484	484	-
Stage 2	-	-	-	-	-	-	484	484	-	640	819	-
Critical Hdwy	4.1	-	-	4.18	-	-	7.21	6.5	6.29	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.21	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.21	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.272	-	-	3.599	4	3.381	3.5	4	3.3
Pot Cap-1 Maneuver	1278	-	-	784	-	-	152	183	411	184	162	749
Stage 1	-	-	-	-	-	-	400	431	-	568	556	-
Stage 2	-	-	-	-	-	-	548	556	-	467	392	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1278	-	-	784	-	-	134	161	411	104	143	749
Mov Cap-2 Maneuver	-	-	-	-	-	-	134	161	-	104	143	-
Stage 1	-	-	-	-	-	-	400	431	-	499	489	-
Stage 2	-	-	-	-	-	-	482	489	-	298	392	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	2.48	24.25	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	134	411	1278	-	-	784	-	-	-
HCM Lane V/C Ratio	0.317	0.361	-	-	-	0.121	-	-	-
HCM Ctrl Dly (s/v)	44	18.6	0	-	-	10.2	-	-	0
HCM Lane LOS	E	C	A	-	-	B	-	-	A
HCM 95th %tile Q(veh)	1.3	1.6	0	-	-	0.4	-	-	-

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	698	599	35	91	40
v/c Ratio	0.56	0.62	0.26	0.37	0.26
Control Delay (s/veh)	7.3	9.3	30.6	11.4	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.3	9.3	30.6	11.4	29.9
Queue Length 50th (ft)	113	107	13	0	14
Queue Length 95th (ft)	224	94	36	35	15
Internal Link Dist (ft)	3521	424	5188		424
Turn Bay Length (ft)				120	
Base Capacity (vph)	1242	966	816	1049	938
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.56	0.62	0.04	0.09	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	574	103	66	237	38	26	9	91	9	5	0
Future Volume (veh/h)	21	574	103	66	237	38	26	9	91	9	5	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1736	1723	1695	1750	1545	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	21	574	103	116	416	67	26	9	91	26	14	0
Peak Hour Factor	1.00	1.00	1.00	0.57	0.57	0.57	1.00	1.00	1.00	0.35	0.35	0.35
Percent Heavy Veh, %	0	1	1	2	4	0	15	0	0	0	0	0
Cap, veh/h	74	991	174	222	743	113	195	52	139	166	67	0
Arrive On Green	0.70	0.70	0.70	0.70	0.70	0.70	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	20	1406	247	216	1054	160	1000	552	1483	748	713	0
Grp Volume(v), veh/h	698	0	0	599	0	0	35	0	91	40	0	0
Grp Sat Flow(s),veh/h/ln	1674	0	0	1430	0	0	1552	0	1483	1461	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.4	0.0	0.0
Cycle Q Clear(g_c), s	12.8	0.0	0.0	10.4	0.0	0.0	1.2	0.0	3.7	1.5	0.0	0.0
Prop In Lane	0.03		0.15	0.19		0.11	0.74		1.00	0.65		0.00
Lane Grp Cap(c), veh/h	1239	0	0	1077	0	0	246	0	139	233	0	0
V/C Ratio(X)	0.56	0.00	0.00	0.56	0.00	0.00	0.14	0.00	0.66	0.17	0.00	0.00
Avail Cap(c_a), veh/h	1239	0	0	1077	0	0	1167	0	1052	1120	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.6	0.0	0.0	4.2	0.0	0.0	26.0	0.0	27.1	26.1	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	0.0	2.1	0.0	0.0	0.3	0.0	5.2	0.3	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	3.0	0.0	0.0	2.5	0.0	0.0	0.5	0.0	1.4	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.5	0.0	0.0	6.3	0.0	0.0	26.2	0.0	32.3	26.4	0.0	0.0
LnGrp LOS	A			A			C		C	C		
Approach Vol, veh/h		698			599			126			40	
Approach Delay, s/veh		6.5			6.3			30.6			26.4	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.9		50.0		11.9		50.0				
Change Period (Y+Rc), s		6.1		6.4		6.1		6.4				
Max Green Setting (Gmax), s		43.9		43.6		43.9		43.6				
Max Q Clear Time (g_c+I1), s		5.7		14.8		3.5		12.4				
Green Ext Time (p_c), s		0.5		5.4		0.2		5.2				

Intersection Summary												
HCM 7th Control Delay, s/veh			9.0									
HCM 7th LOS			A									

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	128	48	91	44	30	76
Future Vol, veh/h	128	48	91	44	30	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	100	100	82	82
Heavy Vehicles, %	2	0	2	7	10	0
Mvmt Flow	142	53	91	44	37	93

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	196	0	395	169
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	226	-
Critical Hdwy	-	-	4.12	-	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	-	-	2.218	-	3.59	3.3
Pot Cap-1 Maneuver	-	-	1377	-	595	880
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	793	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1377	-	554	880
Mov Cap-2 Maneuver	-	-	-	-	554	-
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	739	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	5.26	10.75
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	755	-	-	1213	-
HCM Lane V/C Ratio	0.171	-	-	0.066	-
HCM Ctrl Dly (s/v)	10.8	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	200	37	14	94	11	8	39	49	70	70	12
Future Vol, veh/h	11	200	37	14	94	11	8	39	49	70	70	12
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.83	0.83	0.83	1.00	1.00	1.00
Heavy Vehicles, %	0	1	3	0	3	18	13	5	2	0	0	0
Mvmt Flow	12	215	40	15	99	12	10	47	59	70	70	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	10.1	8.9	9	9.5
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	4%	12%	46%
Vol Thru, %	41%	81%	79%	46%
Vol Right, %	51%	15%	9%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	248	119	152
LT Vol	8	11	14	70
Through Vol	39	200	94	70
RT Vol	49	37	11	12
Lane Flow Rate	116	267	125	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0.159	0.344	0.169	0.212
Departure Headway (Hd)	4.959	4.64	4.859	5.019
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	717	771	733	710
Service Time	3.032	2.696	2.925	3.087
HCM Lane V/C Ratio	0.162	0.346	0.171	0.214
HCM Control Delay, s/veh	9	10.1	8.9	9.5
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.6	1.5	0.6	0.8

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	14	97	31	42	98
Future Vol, veh/h	30	14	97	31	42	98
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	82	82	87	87
Heavy Vehicles, %	3	7	1	0	2	4
Mvmt Flow	35	16	118	38	48	113

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	346	137	0	0	156	0
Stage 1	137	-	-	-	-	-
Stage 2	209	-	-	-	-	-
Critical Hdwy	6.43	6.27	-	-	4.12	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.363	-	-	2.218	-
Pot Cap-1 Maneuver	648	898	-	-	1424	-
Stage 1	887	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	625	898	-	-	1424	-
Mov Cap-2 Maneuver	625	-	-	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	794	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	10.62	0	2.29
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	692	540	-
HCM Lane V/C Ratio	-	-	0.075	0.034	-
HCM Ctrl Dly (s/v)	-	-	10.6	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	304	1	9	208	16	3	43	17	49	58	15
Future Vol, veh/h	39	304	1	9	208	16	3	43	17	49	58	15
Peak Hour Factor	0.84	0.84	0.84	0.85	0.85	0.85	1.00	1.00	1.00	0.69	0.69	0.69
Heavy Vehicles, %	3	11	0	0	11	6	33	5	0	0	2	0
Mvmt Flow	46	362	1	11	245	19	3	43	17	71	84	22
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	15	11.6	10.3	11.1
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	11%	4%	40%
Vol Thru, %	68%	88%	89%	48%
Vol Right, %	27%	0%	7%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	344	233	122
LT Vol	3	39	9	49
Through Vol	43	304	208	58
RT Vol	17	1	16	15
Lane Flow Rate	63	410	274	177
Geometry Grp	1	1	1	1
Degree of Util (X)	0.113	0.581	0.395	0.284
Departure Headway (Hd)	6.439	5.106	5.187	5.784
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	556	708	694	621
Service Time	4.491	3.138	3.224	3.828
HCM Lane V/C Ratio	0.113	0.579	0.395	0.285
HCM Control Delay, s/veh	10.3	15	11.6	11.1
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	0.4	3.8	1.9	1.2

Intersection	
Intersection Delay, s/veh	18.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	76	287	54	55	158	27	8	51	87	7	24	70
Future Vol, veh/h	76	287	54	55	158	27	8	51	87	7	24	70
Peak Hour Factor	0.86	0.86	0.86	0.68	0.68	0.68	0.72	0.72	0.72	0.87	0.87	0.87
Heavy Vehicles, %	7	4	7	4	2	0	0	4	1	14	0	0
Mvmt Flow	88	334	63	81	232	40	11	71	121	8	28	80
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	24.8	16.5	12.6	11.5
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	18%	23%	7%
Vol Thru, %	35%	69%	66%	24%
Vol Right, %	60%	13%	11%	69%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	417	240	101
LT Vol	8	76	55	7
Through Vol	51	287	158	24
RT Vol	87	54	27	70
Lane Flow Rate	203	485	353	116
Geometry Grp	1	1	1	1
Degree of Util (X)	0.35	0.765	0.575	0.214
Departure Headway (Hd)	6.21	5.682	5.865	6.64
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	578	640	618	539
Service Time	4.261	3.694	3.881	4.698
HCM Lane V/C Ratio	0.351	0.758	0.571	0.215
HCM Control Delay, s/veh	12.6	24.8	16.5	11.5
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	1.6	7.1	3.6	0.8

Intersection	
Int Delay, s/veh	15.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	29	138	20	16	68	23	29	63	27	75	73	21
Future Vol, veh/h	29	138	20	16	68	23	29	63	27	75	73	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	64	64	64	93	93	93	81	81	81
Heavy Vehicles, %	0	7	0	13	4	17	3	2	7	0	7	0
Mvmt Flow	48	230	33	25	106	36	31	68	29	93	90	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	472	447	103	535	446	82	116	0	0	97	0	0
Stage 1	288	288	-	145	145	-	-	-	-	-	-	-
Stage 2	183	159	-	390	301	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.57	6.2	7.23	6.54	6.37	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.57	-	6.23	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.57	-	6.23	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.063	3.3	3.617	4.036	3.453	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	506	499	957	439	504	937	1466	-	-	1509	-	-
Stage 1	724	664	-	833	773	-	-	-	-	-	-	-
Stage 2	823	757	-	612	661	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	349	455	957	200	460	937	1466	-	-	1509	-	-
Mov Cap-2 Maneuver	349	455	-	200	460	-	-	-	-	-	-	-
Stage 1	676	621	-	814	756	-	-	-	-	-	-	-
Stage 2	665	740	-	348	618	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	27.82	18.88	1.83	3.35
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	414	-	-	459	425	765	-	-
HCM Lane V/C Ratio	0.021	-	-	0.678	0.394	0.061	-	-
HCM Ctrl Dly (s/v)	7.5	0	-	27.8	18.9	7.5	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	5	1.8	0.2	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	239	5	8	83	17	5	28	13	65	28	12
Future Vol, veh/h	17	239	5	8	83	17	5	28	13	65	28	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	82	82	82	100	100	100	71	71	71
Heavy Vehicles, %	6	5	0	0	10	6	20	4	8	2	4	8
Mvmt Flow	18	260	5	10	101	21	5	28	13	92	39	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	122	0	0	265	0	0	440	441	263	442	433	112
Stage 1	-	-	-	-	-	-	299	299	-	131	131	-
Stage 2	-	-	-	-	-	-	140	141	-	311	302	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.3	6.54	6.28	7.12	6.54	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.54	-	6.12	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.54	-	6.12	5.54	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.68	4.036	3.372	3.518	4.036	3.372
Pot Cap-1 Maneuver	1441	-	-	1310	-	-	498	507	762	526	513	925
Stage 1	-	-	-	-	-	-	672	662	-	872	784	-
Stage 2	-	-	-	-	-	-	821	776	-	700	661	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1441	-	-	1310	-	-	441	496	762	477	501	925
Mov Cap-2 Maneuver	-	-	-	-	-	-	441	496	-	477	501	-
Stage 1	-	-	-	-	-	-	662	652	-	865	778	-
Stage 2	-	-	-	-	-	-	759	770	-	648	651	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.49	0.58	12.26	14.86
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	542	117	-	-	129	-	-	512
HCM Lane V/C Ratio	0.085	0.013	-	-	0.007	-	-	0.289
HCM Ctrl Dly (s/v)	12.3	7.5	0	-	7.8	0	-	14.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	1.2

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	102	10	20	65	13	7	38	35	20	41	16
Future Vol, veh/h	10	102	10	20	65	13	7	38	35	20	41	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	94	94	94	85	85	85	73	73	73
Heavy Vehicles, %	0	11	0	6	15	23	29	18	34	5	32	6
Mvmt Flow	11	111	11	21	69	14	8	45	41	27	56	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	218	224	67	248	215	65	78	0	0	86	0	0
Stage 1	122	122	-	82	82	-	-	-	-	-	-	-
Stage 2	96	102	-	166	133	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.61	6.2	7.16	6.65	6.43	4.39	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.61	-	6.16	5.65	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.61	-	6.16	5.65	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.099	3.3	3.554	4.135	3.507	2.461	-	-	2.245	-	-
Pot Cap-1 Maneuver	743	659	1002	697	661	943	1366	-	-	1492	-	-
Stage 1	887	778	-	917	802	-	-	-	-	-	-	-
Stage 2	916	793	-	826	762	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	639	642	1002	559	644	943	1366	-	-	1492	-	-
Mov Cap-2 Maneuver	639	642	-	559	644	-	-	-	-	-	-	-
Stage 1	870	763	-	911	797	-	-	-	-	-	-	-
Stage 2	819	788	-	685	747	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	11.8	11.58	0.67	1.94
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	144	-	-	662	651	443	-	-
HCM Lane V/C Ratio	0.006	-	-	0.2	0.16	0.018	-	-
HCM Ctrl Dly (s/v)	7.7	0	-	11.8	11.6	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	196	0	18	124	18	0	12	40	22	8	9
Future Vol, veh/h	10	196	0	18	124	18	0	12	40	22	8	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	99	99	99	84	84	84	98	98	98
Heavy Vehicles, %	0	12	0	0	20	6	0	0	5	5	13	0
Mvmt Flow	13	261	0	18	125	18	0	14	48	22	8	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	143	0	0	261	0	0	454	468	261	466	459	134
Stage 1	-	-	-	-	-	-	288	288	-	171	171	-
Stage 2	-	-	-	-	-	-	166	180	-	295	288	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.25	7.15	6.63	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.63	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.63	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.345	3.545	4.117	3.3
Pot Cap-1 Maneuver	1452	-	-	1315	-	-	520	496	770	502	483	920
Stage 1	-	-	-	-	-	-	724	677	-	824	737	-
Stage 2	-	-	-	-	-	-	841	754	-	707	654	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1452	-	-	1315	-	-	493	483	770	446	470	920
Mov Cap-2 Maneuver	-	-	-	-	-	-	493	483	-	446	470	-
Stage 1	-	-	-	-	-	-	716	670	-	812	726	-
Stage 2	-	-	-	-	-	-	811	743	-	642	647	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.36	0.87	10.85	12.62
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	677	87	-	-	197	-	-	512
HCM Lane V/C Ratio	0.091	0.009	-	-	0.014	-	-	0.078
HCM Ctrl Dly (s/v)	10.8	7.5	0	-	7.8	0	-	12.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	158	91	33	162	51
Future Vol, veh/h	31	158	91	33	162	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	88	88	74	74
Heavy Vehicles, %	0	1	7	12	1	0
Mvmt Flow	36	186	103	38	219	69

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	141	0	-	0	381	122
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	4.1	-	-	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.3
Pot Cap-1 Maneuver	1455	-	-	-	623	934
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	787	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1455	-	-	-	606	934
Mov Cap-2 Maneuver	-	-	-	-	606	-
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	787	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	1.24	0	14.57
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	295	-	-	-	662
HCM Lane V/C Ratio	0.025	-	-	-	0.435
HCM Ctrl Dly (s/v)	7.5	0	-	-	14.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2.2

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	4	15	6	21	28
Future Vol, veh/h	13	4	15	6	21	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	47	47	100	100	68	68
Heavy Vehicles, %	0	25	0	0	0	0
Mvmt Flow	28	9	15	6	31	41

Major/Minor	Major1		Minor2	
Conflicting Flow All	0	0	15	21
Stage 1	-	-	0	0
Stage 2	-	-	15	21
Critical Hdwy	-	-	6.4	6.5
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.4	5.5
Follow-up Hdwy	-	-	3.5	4
Pot Cap-1 Maneuver	-	-	1009	877
Stage 1	-	-	-	-
Stage 2	-	-	1013	882
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	1009	0
Mov Cap-2 Maneuver	-	-	1009	0
Stage 1	-	-	-	0
Stage 2	-	-	1013	0

Approach	NB	SB
HCM Ctrl Dly, s/v	0	
HCM LOS		-

Minor Lane/Major Mvmt	NBT	NBR	SBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Ctrl Dly (s/v)	-	-	-
HCM Lane LOS	-	-	-
HCM 95th %tile Q(veh)	-	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	725	37	20	250	8	40
Future Vol, veh/h	725	37	20	250	8	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	100	100	98	98
Heavy Vehicles, %	2	3	0	3	0	3
Mvmt Flow	824	42	20	250	8	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	866	0	1135	845
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	290	-
Critical Hdwy	-	-	4.1	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.327
Pot Cap-1 Maneuver	-	-	786	-	226	361
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	764	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	786	-	220	361
Mov Cap-2 Maneuver	-	-	-	-	335	-
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	745	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.72	16.69
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	357	-	-	786	-
HCM Lane V/C Ratio	0.137	-	-	0.025	-
HCM Ctrl Dly (s/v)	16.7	-	-	9.7	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.5

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	67	151	210	86	80	105
Future Vol, veh/h	67	151	210	86	80	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	80	80	100	100
Heavy Vehicles, %	13	1	10	5	3	19
Mvmt Flow	76	172	263	108	80	105

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	581	316	0	0	370	0
Stage 1	316	-	-	-	-	-
Stage 2	265	-	-	-	-	-
Critical Hdwy	6.53	6.21	-	-	4.13	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.309	-	-	2.227	-
Pot Cap-1 Maneuver	458	727	-	-	1183	-
Stage 1	715	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	425	727	-	-	1183	-
Mov Cap-2 Maneuver	425	-	-	-	-	-
Stage 1	715	-	-	-	-	-
Stage 2	700	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	15.26	0	3.57
HCM LOS	C		

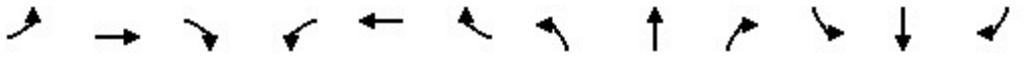
Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	596	778	-
HCM Lane V/C Ratio	-	-	0.415	0.068	-
HCM Ctrl Dly (s/v)	-	-	15.3	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2	0.2	-

Existing PM Capacity:

Queues
2: 54th Street West & Rimrock Road 10/19/2025

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	192	145	384	83	82	163	59	33
v/c Ratio	0.00	0.21	0.19	0.32	0.08	0.49	0.55	0.46	0.15
Control Delay (s/veh)	5.0	11.0	4.9	7.7	1.4	43.3	18.4	44.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	5.0	11.0	4.9	7.7	1.4	43.3	18.4	44.6	29.7
Queue Length 50th (ft)	0	46	19	60	0	39	21	29	13
Queue Length 95th (ft)	2	94	45	184	13	81	73	67	39
Internal Link Dist (ft)		4323		924			5202		920
Turn Bay Length (ft)	250		250		250	200		150	
Base Capacity (vph)	676	929	762	1194	1049	453	613	350	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.21	0.19	0.32	0.08	0.18	0.27	0.17	0.05

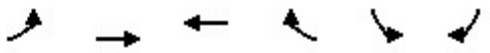
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	173	19	136	361	78	72	40	104	59	29	4
Future Volume (veh/h)	2	173	19	136	361	78	72	40	104	59	29	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1750
Adj Flow Rate, veh/h	2	173	19	145	384	83	82	45	118	59	29	4
Peak Hour Factor	1.00	1.00	1.00	0.94	0.94	0.94	0.88	0.88	0.88	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	3	3	0	0
Cap, veh/h	536	820	90	759	1029	872	305	74	193	178	259	36
Arrive On Green	0.00	0.53	0.53	0.06	0.59	0.59	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1667	1549	170	1667	1750	1483	1398	427	1121	1213	1505	208
Grp Volume(v), veh/h	2	0	192	145	384	83	82	0	163	59	0	33
Grp Sat Flow(s),veh/h/ln	1667	0	1719	1667	1750	1483	1398	0	1548	1213	0	1713
Q Serve(g_s), s	0.0	0.0	4.9	3.2	9.5	2.0	4.3	0.0	8.0	3.9	0.0	1.3
Cycle Q Clear(g_c), s	0.0	0.0	4.9	3.2	9.5	2.0	5.7	0.0	8.0	11.9	0.0	1.3
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.72	1.00		0.12
Lane Grp Cap(c), veh/h	536	0	910	759	1029	872	305	0	266	178	0	295
V/C Ratio(X)	0.00	0.00	0.21	0.19	0.37	0.10	0.27	0.00	0.61	0.33	0.00	0.11
Avail Cap(c_a), veh/h	704	0	910	828	1029	872	549	0	537	390	0	594
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.2	0.0	10.3	7.6	8.9	7.4	31.1	0.0	31.5	37.0	0.0	28.7
Incr Delay (d2), s/veh	0.0	0.0	0.5	0.1	1.0	0.2	0.5	0.0	2.3	1.1	0.0	0.2
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	0.0	0.0	1.6	0.9	3.2	0.6	1.4	0.0	3.0	1.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	9.2	0.0	10.8	7.7	10.0	7.6	31.6	0.0	33.8	38.1	0.0	28.9
LnGrp LOS	A		B	A	A	A	C		C	D		C
Approach Vol, veh/h		194			612			245			92	
Approach Delay, s/veh		10.8			9.1			33.0			34.8	
Approach LOS		B			A			C			C	

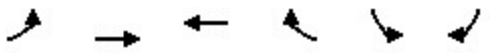
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.6	50.0		20.6	6.7	54.9		20.6				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	8.5	43.5		28.5	8.5	43.5		28.5				
Max Q Clear Time (g_c+I1), s	5.2	6.9		13.9	2.0	11.5		10.0				
Green Ext Time (p_c), s	0.1	0.9		0.2	0.0	2.5		1.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			16.6									
HCM 7th LOS			B									



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	122	210	436	200	124	90
v/c Ratio	0.19	0.17	0.48	0.18	0.55	0.16
Control Delay (s/veh)	4.3	4.6	16.1	1.0	44.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	4.3	4.6	16.1	1.0	44.3	4.8
Queue Length 50th (ft)	15	30	137	0	62	0
Queue Length 95th (ft)	35	61	223	12	122	28
Internal Link Dist (ft)		1579	3521		5202	
Turn Bay Length (ft)	400			400		250
Base Capacity (vph)	1015	1750	915	1473	860	1146
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.12	0.48	0.14	0.14	0.08

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	113	195	353	162	124	90
Future Volume (veh/h)	113	195	353	162	124	90
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1723	1750	1750	1736	1736	1750
Adj Flow Rate, veh/h	122	210	436	200	124	90
Peak Hour Factor	0.93	0.93	0.81	0.81	1.00	1.00
Percent Heavy Veh, %	2	0	0	1	1	0
Cap, veh/h	568	1262	1045	1036	177	251
Arrive On Green	0.06	0.72	0.60	0.60	0.11	0.11
Sat Flow, veh/h	1641	1750	1750	1471	1654	1483
Grp Volume(v), veh/h	122	210	436	200	124	90
Grp Sat Flow(s),veh/h/ln	1641	1750	1750	1471	1654	1483
Q Serve(g_s), s	1.8	2.8	9.8	3.4	5.3	3.9
Cycle Q Clear(g_c), s	1.8	2.8	9.8	3.4	5.3	3.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	568	1262	1045	1036	177	251
V/C Ratio(X)	0.21	0.17	0.42	0.19	0.70	0.36
Avail Cap(c_a), veh/h	1485	2240	1045	1036	987	978
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	5.0	3.2	7.9	3.7	31.6	26.9
Incr Delay (d2), s/veh	0.2	0.1	1.2	0.4	5.0	0.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.5	3.0	1.2	2.2	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	5.2	3.3	9.1	4.1	36.6	27.7
LnGrp LOS	A	A	A	A	D	C
Approach Vol, veh/h		332	636		214	
Approach Delay, s/veh		4.0	7.6		32.9	
Approach LOS		A	A		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		59.1		14.1	9.1	50.0
Change Period (Y+Rc), s		6.3		6.3	4.5	6.3
Max Green Setting (Gmax), s		93.7		43.7	45.5	43.7
Max Q Clear Time (g_c+I1), s		4.8		7.3	3.8	11.8
Green Ext Time (p_c), s		1.2		0.6	0.3	3.3

Intersection Summary	
HCM 7th Control Delay, s/veh	11.1
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	300	61	107	341	0	76	0	174	0	0	0
Future Vol, veh/h	0	300	61	107	341	0	76	0	174	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	200	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	87	87	87	100	100	100	100	100	100
Heavy Vehicles, %	0	1	2	2	0	0	1	0	3	0	0	0
Mvmt Flow	0	341	69	123	392	0	76	0	174	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	392	0	0	410	0	0	1013	1013	376	979	1048	392
Stage 1	-	-	-	-	-	-	376	376	-	638	638	-
Stage 2	-	-	-	-	-	-	638	638	-	341	410	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.11	6.5	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.509	4	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1178	-	-	1149	-	-	218	241	669	231	230	661
Stage 1	-	-	-	-	-	-	648	620	-	468	474	-
Stage 2	-	-	-	-	-	-	467	474	-	678	599	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1178	-	-	1149	-	-	195	215	669	153	205	661
Mov Cap-2 Maneuver	-	-	-	-	-	-	195	215	-	153	205	-
Stage 1	-	-	-	-	-	-	648	620	-	418	423	-
Stage 2	-	-	-	-	-	-	417	423	-	502	599	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	2.03	19.13	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	195	669	1178	-	-	1149	-	-	-
HCM Lane V/C Ratio	0.39	0.26	-	-	-	0.107	-	-	-
HCM Ctrl Dly (s/v)	34.8	12.3	0	-	-	8.5	-	-	0
HCM Lane LOS	D	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	1.7	1	0	-	-	0.4	-	-	-

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	370	863	85	59	4
v/c Ratio	0.30	0.79	0.45	0.22	0.02
Control Delay (s/veh)	5.5	16.6	33.4	9.8	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	5.5	16.6	33.4	9.8	23.5
Queue Length 50th (ft)	51	223	32	0	1
Queue Length 95th (ft)	107	#368	70	28	9
Internal Link Dist (ft)	3521	424	5188		424
Turn Bay Length (ft)				120	
Base Capacity (vph)	1232	1096	867	1006	884
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.30	0.79	0.10	0.06	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	295	56	112	565	5	85	0	59	3	1	0
Future Volume (veh/h)	0	295	56	112	565	5	85	0	59	3	1	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1750	1750	1750	1750	1736	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	0	311	59	142	715	6	85	0	59	3	1	0
Peak Hour Factor	0.95	0.95	0.95	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	1	0	0	0	0	1	0	0	0	0	0
Cap, veh/h	0	1009	191	219	979	8	251	0	126	141	31	0
Arrive On Green	0.00	0.71	0.71	0.71	0.71	0.71	0.08	0.00	0.08	0.08	0.08	0.00
Sat Flow, veh/h	0	1419	269	212	1376	11	1571	0	1483	456	370	0
Grp Volume(v), veh/h	0	0	370	863	0	0	85	0	59	4	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1688	1599	0	0	1571	0	1483	826	0	0
Q Serve(g_s), s	0.0	0.0	5.0	12.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	5.0	19.7	0.0	0.0	3.0	0.0	2.3	3.0	0.0	0.0
Prop In Lane	0.00		0.16	0.16		0.01	1.00		1.00	0.75		0.00
Lane Grp Cap(c), veh/h	0	0	1200	1206	0	0	251	0	126	173	0	0
V/C Ratio(X)	0.00	0.00	0.31	0.72	0.00	0.00	0.34	0.00	0.47	0.02	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1200	1206	0	0	1159	0	1062	1085	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)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	3.3	5.2	0.0	0.0	27.0	0.0	26.7	25.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.7	3.7	0.0	0.0	0.8	0.0	2.7	0.1	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	0.0	0.0	1.1	4.3	0.0	0.0	1.2	0.0	0.9	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	3.9	8.9	0.0	0.0	27.8	0.0	29.4	25.8	0.0	0.0
LnGrp LOS			A	A			C		C	C		
Approach Vol, veh/h		370			863			144			4	
Approach Delay, s/veh		3.9			8.9			28.5			25.8	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	11.3	50.0	11.3	50.0
Change Period (Y+Rc), s	6.1	6.4	6.1	6.4
Max Green Setting (Gmax), s	43.9	43.6	43.9	43.6
Max Q Clear Time (g_c+I1), s	5.0	7.0	5.0	21.7
Green Ext Time (p_c), s	0.6	2.4	0.0	7.0

Intersection Summary	
HCM 7th Control Delay, s/veh	9.7
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	85	23	98	132	49	111
Future Vol, veh/h	85	23	98	132	49	111
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	100	100	100	100
Heavy Vehicles, %	0	2	0	0	2	0
Mvmt Flow	101	27	98	132	49	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	129	0	443	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	328	-
Critical Hdwy	-	-	4.1	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.3
Pot Cap-1 Maneuver	-	-	1470	-	572	943
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	730	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1470	-	531	943
Mov Cap-2 Maneuver	-	-	-	-	531	-
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	677	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	3.25	10.98
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	762	-	-	767	-
HCM Lane V/C Ratio	0.21	-	-	0.067	-
HCM Ctrl Dly (s/v)	11	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.2	-

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	142	19	28	252	53	46	84	24	36	73	10
Future Vol, veh/h	15	142	19	28	252	53	46	84	24	36	73	10
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.72	0.72	0.72	0.88	0.88	0.88
Heavy Vehicles, %	0	3	5	0	0	4	0	0	0	0	1	0
Mvmt Flow	16	148	20	29	265	56	64	117	33	41	83	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	10.5	13.1	11.3	10.3
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	9%	8%	30%
Vol Thru, %	55%	81%	76%	61%
Vol Right, %	16%	11%	16%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	154	176	333	119
LT Vol	46	15	28	36
Through Vol	84	142	252	73
RT Vol	24	19	53	10
Lane Flow Rate	214	183	351	135
Geometry Grp	1	1	1	1
Degree of Util (X)	0.328	0.274	0.497	0.214
Departure Headway (Hd)	5.518	5.385	5.108	5.705
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	650	666	705	627
Service Time	3.561	3.43	3.146	3.754
HCM Lane V/C Ratio	0.329	0.275	0.498	0.215
HCM Control Delay, s/veh	11.3	10.5	13.1	10.3
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	1.4	1.1	2.8	0.8

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	35	148	35	11	107
Future Vol, veh/h	55	35	148	35	11	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	79	79	81	81
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	55	35	187	44	14	132

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	369	209	0	0	232	0
Stage 1	209	-	-	-	-	-
Stage 2	159	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	635	836	-	-	1348	-
Stage 1	830	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	629	836	-	-	1348	-
Mov Cap-2 Maneuver	629	-	-	-	-	-
Stage 1	830	-	-	-	-	-
Stage 2	865	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	10.94	0	0.72
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	696	168	-
HCM Lane V/C Ratio	-	-	0.129	0.01	-
HCM Ctrl Dly (s/v)	-	-	10.9	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Intersection Delay, s/veh	18.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	291	8	29	375	65	3	59	20	42	60	17
Future Vol, veh/h	30	291	8	29	375	65	3	59	20	42	60	17
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.68	0.68	0.68	0.99	0.99	0.99
Heavy Vehicles, %	0	1	0	0	0	0	0	0	0	0	3	0
Mvmt Flow	34	331	9	33	426	74	4	87	29	42	61	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	15.6	23.4	11.2	11.4
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	9%	6%	35%
Vol Thru, %	72%	88%	80%	50%
Vol Right, %	24%	2%	14%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	329	469	119
LT Vol	3	30	29	42
Through Vol	59	291	375	60
RT Vol	20	8	65	17
Lane Flow Rate	121	374	533	120
Geometry Grp	1	1	1	1
Degree of Util (X)	0.214	0.568	0.768	0.217
Departure Headway (Hd)	6.382	5.468	5.187	6.503
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	558	654	693	548
Service Time	4.473	3.535	3.246	4.594
HCM Lane V/C Ratio	0.217	0.572	0.769	0.219
HCM Control Delay, s/veh	11.2	15.6	23.4	11.4
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	0.8	3.6	7.3	0.8

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	204	6	27	271	25	2	47	29	14	38	96
Future Vol, veh/h	77	204	6	27	271	25	2	47	29	14	38	96
Peak Hour Factor	0.81	0.81	0.81	0.99	0.99	0.99	0.89	0.89	0.89	0.79	0.79	0.79
Heavy Vehicles, %	0	2	0	0	1	0	0	0	3	0	0	0
Mvmt Flow	95	252	7	27	274	25	2	53	33	18	48	122
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	13.6	12.7	9.8	10.6
HCM LOS	B	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	27%	8%	9%
Vol Thru, %	60%	71%	84%	26%
Vol Right, %	37%	2%	8%	65%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	78	287	323	148
LT Vol	2	77	27	14
Through Vol	47	204	271	38
RT Vol	29	6	25	96
Lane Flow Rate	88	354	326	187
Geometry Grp	1	1	1	1
Degree of Util (X)	0.141	0.512	0.469	0.283
Departure Headway (Hd)	5.798	5.202	5.175	5.441
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	616	691	695	659
Service Time	3.857	3.24	3.214	3.49
HCM Lane V/C Ratio	0.143	0.512	0.469	0.284
HCM Control Delay, s/veh	9.8	13.6	12.7	10.6
HCM Lane LOS	A	B	B	B
HCM 95th-tile Q	0.5	2.9	2.5	1.2

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	67	11	22	121	60	5	107	22	26	49	13
Future Vol, veh/h	15	67	11	22	121	60	5	107	22	26	49	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	79	79	79	66	66	66	85	85	85
Heavy Vehicles, %	0	3	9	0	0	0	0	0	0	0	2	0
Mvmt Flow	21	96	16	28	153	76	8	162	33	31	58	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	380	337	65	361	328	179	73	0	0	195	0	0
Stage 1	126	126	-	194	194	-	-	-	-	-	-	-
Stage 2	254	211	-	167	134	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.53	6.29	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.027	3.381	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	581	582	979	599	594	869	1540	-	-	1390	-	-
Stage 1	882	789	-	812	744	-	-	-	-	-	-	-
Stage 2	755	726	-	840	789	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	381	566	979	478	577	869	1540	-	-	1390	-	-
Mov Cap-2 Maneuver	381	566	-	478	577	-	-	-	-	-	-	-
Stage 1	862	771	-	808	740	-	-	-	-	-	-	-
Stage 2	543	722	-	707	771	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	13.61	14.72	0.27	2.26
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	65	-	-	550	625	510	-	-
HCM Lane V/C Ratio	0.005	-	-	0.241	0.411	0.022	-	-
HCM Ctrl Dly (s/v)	7.3	0	-	13.6	14.7	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.9	2	0.1	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	156	1	25	293	42	2	41	19	19	27	9
Future Vol, veh/h	8	156	1	25	293	42	2	41	19	19	27	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	89	89	89	100	100	100	67	67	67
Heavy Vehicles, %	13	2	0	0	1	0	0	0	0	5	0	0
Mvmt Flow	10	193	1	28	329	47	2	41	19	28	40	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	376	0	0	194	0	0	619	646	193	642	623	353
Stage 1	-	-	-	-	-	-	213	213	-	409	409	-
Stage 2	-	-	-	-	-	-	406	433	-	233	214	-
Critical Hdwy	4.23	-	-	4.1	-	-	7.1	6.5	6.2	7.15	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.5	-
Follow-up Hdwy	2.317	-	-	2.2	-	-	3.5	4	3.3	3.545	4	3.3
Pot Cap-1 Maneuver	1124	-	-	1391	-	-	404	393	853	383	405	695
Stage 1	-	-	-	-	-	-	794	730	-	613	600	-
Stage 2	-	-	-	-	-	-	626	585	-	763	730	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1124	-	-	1391	-	-	344	379	853	323	391	695
Mov Cap-2 Maneuver	-	-	-	-	-	-	344	379	-	323	391	-
Stage 1	-	-	-	-	-	-	786	723	-	598	584	-
Stage 2	-	-	-	-	-	-	557	570	-	697	722	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.4	0.53	14.15	16.65
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	455	87	-	-	122	-	-	391
HCM Lane V/C Ratio	0.136	0.009	-	-	0.02	-	-	0.21
HCM Ctrl Dly (s/v)	14.2	8.2	0	-	7.6	0	-	16.6
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.8

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	47	2	15	106	27	4	46	16	10	25	20
Future Vol, veh/h	15	47	2	15	106	27	4	46	16	10	25	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	74	74	74	100	100	100	60	86	86
Heavy Vehicles, %	0	4	0	0	0	4	0	4	19	0	0	5
Mvmt Flow	15	47	2	20	143	36	4	46	16	17	29	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	200	144	41	148	148	54	52	0	0	62	0	0
Stage 1	74	74	-	62	62	-	-	-	-	-	-	-
Stage 2	126	70	-	86	86	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.54	6.2	7.1	6.5	6.24	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.54	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.54	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.036	3.3	3.5	4	3.336	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	763	744	1036	825	747	1008	1566	-	-	1554	-	-
Stage 1	940	829	-	954	847	-	-	-	-	-	-	-
Stage 2	883	833	-	927	828	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	586	733	1036	761	737	1008	1566	-	-	1554	-	-
Mov Cap-2 Maneuver	586	733	-	761	737	-	-	-	-	-	-	-
Stage 1	930	820	-	952	845	-	-	-	-	-	-	-
Stage 2	705	831	-	862	819	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	10.67	11.22	0.44	1.77
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	104	-	-	699	778	399	-	-
HCM Lane V/C Ratio	0.003	-	-	0.092	0.257	0.011	-	-
HCM Ctrl Dly (s/v)	7.3	0	-	10.7	11.2	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	1	0	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	112	1	38	185	17	0	17	40	10	16	17
Future Vol, veh/h	4	112	1	38	185	17	0	17	40	10	16	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	80	80	80	100	100	100	72	72	72
Heavy Vehicles, %	0	6	0	3	1	0	0	0	5	0	0	0
Mvmt Flow	4	112	1	48	231	21	0	17	40	14	22	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	253	0	0	113	0	0	458	468	113	465	458	242
Stage 1	-	-	-	-	-	-	121	121	-	337	337	-
Stage 2	-	-	-	-	-	-	337	348	-	129	121	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.25	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.345	3.5	4	3.3
Pot Cap-1 Maneuver	1325	-	-	1470	-	-	517	496	932	511	502	802
Stage 1	-	-	-	-	-	-	889	800	-	682	645	-
Stage 2	-	-	-	-	-	-	681	638	-	880	800	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1325	-	-	1470	-	-	460	476	932	453	482	802
Mov Cap-2 Maneuver	-	-	-	-	-	-	460	476	-	453	482	-
Stage 1	-	-	-	-	-	-	886	797	-	656	621	-
Stage 2	-	-	-	-	-	-	613	614	-	822	797	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.26	1.19	10.39	12.16
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	725	61	-	-	280	-	-	562
HCM Lane V/C Ratio	0.079	0.003	-	-	0.032	-	-	0.106
HCM Ctrl Dly (s/v)	10.4	7.7	0	-	7.5	0	-	12.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	146	190	117	47	41
Future Vol, veh/h	55	146	190	117	47	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	79	79	69	69
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	57	151	241	148	68	59

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	389	0	-	0	578	315
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	264	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1181	-	-	-	481	731
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	785	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1181	-	-	-	456	731
Mov Cap-2 Maneuver	-	-	-	-	456	-
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	2.24	0	13.46
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	493	-	-	-	553
HCM Lane V/C Ratio	0.048	-	-	-	0.231
HCM Ctrl Dly (s/v)	8.2	0	-	-	13.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	18	38	11	13	9
Future Vol, veh/h	12	18	38	11	13	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	71	71	79	79
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	24	36	54	15	16	11

Major/Minor	Major1		Minor2	
Conflicting Flow All	0	0	54	69
Stage 1	-	-	0	0
Stage 2	-	-	54	69
Critical Hdwy	-	-	6.4	6.5
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.4	5.5
Follow-up Hdwy	-	-	3.5	4
Pot Cap-1 Maneuver	-	-	960	825
Stage 1	-	-	-	-
Stage 2	-	-	974	841
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	960	0
Mov Cap-2 Maneuver	-	-	960	0
Stage 1	-	-	-	0
Stage 2	-	-	974	0

Approach	NB	SB
HCM Ctrl Dly, s/v	0	
HCM LOS		-

Minor Lane/Major Mvmt	NBT	NBR	SBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Ctrl Dly (s/v)	-	-	-
HCM Lane LOS	-	-	-
HCM 95th %tile Q(veh)	-	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	325	16	47	608	14	19
Future Vol, veh/h	325	16	47	608	14	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	86	86	100	100
Heavy Vehicles, %	2	0	0	0	0	5
Mvmt Flow	339	17	55	707	14	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	355	0	1163	347
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	816	-
Critical Hdwy	-	-	4.1	-	6.4	6.25
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.345
Pot Cap-1 Maneuver	-	-	1215	-	217	689
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	438	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1215	-	207	689
Mov Cap-2 Maneuver	-	-	-	-	326	-
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	418	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.58	13.28
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	468	-	-	1215	-
HCM Lane V/C Ratio	0.071	-	-	0.045	-
HCM Ctrl Dly (s/v)	13.3	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	17.3

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	59	371	129	48	146	208
Future Vol, veh/h	59	371	129	48	146	208
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	83	83	100	100
Heavy Vehicles, %	2	2	5	0	0	1
Mvmt Flow	84	530	155	58	146	208

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	684	184	0	0	213	0
Stage 1	184	-	-	-	-	-
Stage 2	500	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.2	-
Pot Cap-1 Maneuver	414	858	-	-	1369	-
Stage 1	847	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	364	858	-	-	1369	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	536	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	31.3	0	3.28
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	723	742	-
HCM Lane V/C Ratio	-	-	0.849	0.107	-
HCM Ctrl Dly (s/v)	-	-	31.3	7.9	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	9.8	0.4	-

MOVEMENT SUMMARY

Site: [101] King Ave & 56th St AM (Existing)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	84	3.0	84	3.0	0.306	6.8	LOS A	1.6	39.7	0.50	0.33	0.50	37.2
4	T1	All MCs	165	0.8	165	0.8	0.306	6.5	LOS A	1.6	39.7	0.50	0.33	0.50	36.5
14	R2	All MCs	63	0.0	63	0.0	0.306	6.5	LOS A	1.6	39.7	0.50	0.33	0.50	37.7
Approach			311	1.2	311	1.2	0.306	6.6	LOS A	1.6	39.7	0.50	0.33	0.50	36.9
West: King Avenue															
5	L2	All MCs	76	6.2	76	6.2	0.455	9.1	LOS A	2.7	69.1	0.58	0.37	0.58	35.5
2	T1	All MCs	360	1.3	360	1.3	0.455	8.5	LOS A	2.7	69.1	0.58	0.37	0.58	38.3
12	R2	All MCs	24	10.0	24	10.0	0.455	9.5	LOS A	2.7	69.1	0.58	0.37	0.58	35.4
Approach			460	2.6	460	2.6	0.455	8.7	LOS A	2.7	69.1	0.58	0.37	0.58	37.6
South: 56th Street West															
3	L2	All MCs	22	0.0	22	0.0	0.195	6.3	LOS A	0.8	20.7	0.58	0.47	0.58	37.8
8	T1	All MCs	96	3.9	96	3.9	0.195	6.9	LOS A	0.8	20.7	0.58	0.47	0.58	36.2
18	R2	All MCs	30	4.2	30	4.2	0.195	6.9	LOS A	0.8	20.7	0.58	0.47	0.58	37.3
Approach			149	3.4	149	3.4	0.195	6.8	LOS A	0.8	20.7	0.58	0.47	0.58	36.7
East: King Avenue															
1	L2	All MCs	22	5.9	22	5.9	0.256	5.9	LOS A	1.3	32.5	0.41	0.24	0.41	37.4
6	T1	All MCs	233	2.7	233	2.7	0.256	5.6	LOS A	1.3	32.5	0.41	0.24	0.41	40.3
16	R2	All MCs	19	20.0	19	20.0	0.256	7.2	LOS A	1.3	32.5	0.41	0.24	0.41	35.8
Approach			274	4.2	274	4.2	0.256	5.7	LOS A	1.3	32.5	0.41	0.24	0.41	39.7
All Vehicles			1195	2.7	1195	2.7	0.455	7.2	LOS A	2.7	69.1	0.52	0.34	0.52	37.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [102] King Ave & 56th St PM (Existing)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	43	0.0	43	0.0	0.192	5.4	LOS A	0.9	22.3	0.47	0.32	0.47	38.6
4	T1	All MCs	73	0.0	73	0.0	0.192	5.4	LOS A	0.9	22.3	0.47	0.32	0.47	37.5
14	R2	All MCs	76	0.0	76	0.0	0.192	5.4	LOS A	0.9	22.3	0.47	0.32	0.47	38.8
Approach			192	0.0	192	0.0	0.192	5.4	LOS A	0.9	22.3	0.47	0.32	0.47	38.3
West: King Avenue															
5	L2	All MCs	48	0.0	48	0.0	0.246	5.1	LOS A	1.3	32.0	0.33	0.16	0.33	38.6
2	T1	All MCs	235	1.5	235	1.5	0.246	5.2	LOS A	1.3	32.0	0.33	0.16	0.33	40.6
12	R2	All MCs	8	14.3	8	14.3	0.246	6.2	LOS A	1.3	32.0	0.33	0.16	0.33	36.7
Approach			290	1.6	290	1.6	0.246	5.2	LOS A	1.3	32.0	0.33	0.16	0.33	40.2
South: 56th Street West															
3	L2	All MCs	32	0.0	32	0.0	0.234	5.9	LOS A	1.1	27.9	0.50	0.34	0.50	39.7
8	T1	All MCs	172	0.0	172	0.0	0.234	5.9	LOS A	1.1	27.9	0.50	0.34	0.50	38.5
18	R2	All MCs	25	5.0	25	5.0	0.234	6.4	LOS A	1.1	27.9	0.50	0.34	0.50	39.0
Approach			229	0.6	229	0.6	0.234	5.9	LOS A	1.1	27.9	0.50	0.34	0.50	38.8
East: King Avenue															
1	L2	All MCs	18	0.0	18	0.0	0.329	6.6	LOS A	1.8	44.5	0.48	0.30	0.48	38.0
6	T1	All MCs	263	1.2	263	1.2	0.329	6.7	LOS A	1.8	44.5	0.48	0.30	0.48	40.0
16	R2	All MCs	66	0.0	66	0.0	0.329	6.6	LOS A	1.8	44.5	0.48	0.30	0.48	38.4
Approach			348	0.9	348	0.9	0.329	6.7	LOS A	1.8	44.5	0.48	0.30	0.48	39.6
All Vehicles			1059	0.9	1059	0.9	0.329	5.9	LOS A	1.8	44.5	0.44	0.28	0.44	39.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [103] Central Ave & 56th St AM (Existing)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	131	2.2	131	2.2	0.316	6.1	LOS A	1.7	43.8	0.39	0.21	0.39	35.6
4	T1	All MCs	228	1.9	228	1.9	0.316	6.1	LOS A	1.7	43.8	0.39	0.21	0.39	36.3
14	R2	All MCs	1	0.0	1	0.0	0.316	5.9	LOS A	1.7	43.8	0.39	0.21	0.39	36.3
Approach			361	2.0	361	2.0	0.316	6.1	LOS A	1.7	43.8	0.39	0.21	0.39	36.1
West: Central Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.095	5.0	LOS A	0.4	9.9	0.51	0.39	0.51	37.5
2	T1	All MCs	68	0.0	68	0.0	0.095	5.0	LOS A	0.4	9.9	0.51	0.39	0.51	38.3
12	R2	All MCs	14	0.0	14	0.0	0.095	5.0	LOS A	0.4	9.9	0.51	0.39	0.51	37.9
Approach			83	0.0	83	0.0	0.095	5.0	LOS A	0.4	9.9	0.51	0.39	0.51	38.2
South: 56th Street West															
3	L2	All MCs	4	75.0	4	75.0	0.154	12.3	LOS B	0.7	17.7	0.37	0.21	0.37	27.9
8	T1	All MCs	73	6.1	73	6.1	0.154	4.8	LOS A	0.7	17.7	0.37	0.21	0.37	37.6
18	R2	All MCs	87	0.0	87	0.0	0.154	4.4	LOS A	0.7	17.7	0.37	0.21	0.37	38.2
Approach			164	4.7	164	4.7	0.154	4.7	LOS A	0.7	17.7	0.37	0.21	0.37	37.6
East: Central Avenue															
1	L2	All MCs	80	2.1	80	2.1	0.211	4.5	LOS A	1.0	26.8	0.25	0.10	0.25	36.5
6	T1	All MCs	72	4.7	72	4.7	0.211	4.7	LOS A	1.0	26.8	0.25	0.10	0.25	36.9
16	R2	All MCs	100	10.0	100	10.0	0.211	5.1	LOS A	1.0	26.8	0.25	0.10	0.25	35.7
Approach			252	6.0	252	6.0	0.211	4.8	LOS A	1.0	26.8	0.25	0.10	0.25	36.3
All Vehicles			860	3.5	860	3.5	0.316	5.4	LOS A	1.7	43.8	0.36	0.20	0.36	36.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [104] Central Ave & 56th St PM (Existing)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	32	0.0	32	0.0	0.174	4.6	LOS A	0.8	20.8	0.35	0.19	0.35	37.3
4	T1	All MCs	156	0.9	156	0.9	0.174	4.6	LOS A	0.8	20.8	0.35	0.19	0.35	37.9
14	R2	All MCs	12	0.0	12	0.0	0.174	4.6	LOS A	0.8	20.8	0.35	0.19	0.35	37.7
Approach			200	0.7	200	0.7	0.174	4.6	LOS A	0.8	20.8	0.35	0.19	0.35	37.8
West: Central Avenue															
5	L2	All MCs	2	0.0	2	0.0	0.091	4.2	LOS A	0.4	9.8	0.39	0.25	0.39	38.0
2	T1	All MCs	85	0.0	85	0.0	0.091	4.2	LOS A	0.4	9.8	0.39	0.25	0.39	38.8
12	R2	All MCs	10	0.0	10	0.0	0.091	4.2	LOS A	0.4	9.8	0.39	0.25	0.39	38.4
Approach			96	0.0	96	0.0	0.091	4.2	LOS A	0.4	9.8	0.39	0.25	0.39	38.7
South: 56th Street West															
3	L2	All MCs	11	0.0	11	0.0	0.203	4.7	LOS A	1.0	25.6	0.29	0.14	0.29	37.7
8	T1	All MCs	186	0.0	186	0.0	0.203	4.7	LOS A	1.0	25.6	0.29	0.14	0.29	38.4
18	R2	All MCs	52	0.0	52	0.0	0.203	4.7	LOS A	1.0	25.6	0.29	0.14	0.29	38.1
Approach			249	0.0	249	0.0	0.203	4.7	LOS A	1.0	25.6	0.29	0.14	0.29	38.3
East: Central Avenue															
1	L2	All MCs	69	0.0	69	0.0	0.211	5.1	LOS A	1.0	25.9	0.39	0.22	0.39	36.8
6	T1	All MCs	94	0.0	94	0.0	0.211	5.1	LOS A	1.0	25.9	0.39	0.22	0.39	37.5
16	R2	All MCs	75	0.0	75	0.0	0.211	5.1	LOS A	1.0	25.9	0.39	0.22	0.39	37.2
Approach			238	0.0	238	0.0	0.211	5.1	LOS A	1.0	25.9	0.39	0.22	0.39	37.2
All Vehicles			783	0.2	783	0.2	0.211	4.7	LOS A	1.0	25.9	0.35	0.19	0.35	37.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [103 (2)] Rimrock Rd & 62nd St AM (Existing)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV %]	Arrival Flows [Total veh/h	HV %]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 62nd Street West															
7	L2	All MCs	527	0.0	527	0.0	0.565	9.2	LOS A	4.6	115.9	0.49	0.24	0.49	33.2
4	T1	All MCs	156	1.0	156	1.0	0.565	9.3	LOS A	4.6	115.9	0.49	0.24	0.49	32.0
14	R2	All MCs	3	0.0	3	0.0	0.565	9.2	LOS A	4.6	115.9	0.49	0.24	0.49	33.4
Approach			686	0.2	686	0.2	0.565	9.2	LOS A	4.6	115.9	0.49	0.24	0.49	32.9
West: Rimrock Road															
5	L2	All MCs	2	0.0	2	0.0	0.356	10.0	LOS A	1.7	42.7	0.70	0.65	0.80	34.2
2	T1	All MCs	136	3.0	136	3.0	0.356	10.6	LOS B	1.7	42.7	0.70	0.65	0.80	36.3
12	R2	All MCs	89	1.0	89	1.0	0.356	10.2	LOS B	1.7	42.7	0.70	0.65	0.80	34.4
Approach			227	2.2	227	2.2	0.356	10.5	LOS B	1.7	42.7	0.70	0.65	0.80	35.5
South: 62nd Street West															
3	L2	All MCs	22	12.0	22	12.0	0.143	8.0	LOS A	0.5	13.4	0.61	0.53	0.61	33.5
8	T1	All MCs	31	17.0	31	17.0	0.143	9.0	LOS A	0.5	13.4	0.61	0.53	0.61	31.9
18	R2	All MCs	31	4.0	31	4.0	0.143	6.6	LOS A	0.5	13.4	0.61	0.53	0.61	34.8
Approach			84	10.9	84	10.9	0.143	7.8	LOS A	0.5	13.4	0.61	0.53	0.61	33.3
East: Rimrock Road															
1	L2	All MCs	35	4.0	35	4.0	0.164	4.2	LOS A	0.8	19.9	0.20	0.07	0.20	36.7
6	T1	All MCs	53	17.0	53	17.0	0.164	5.0	LOS A	0.8	19.9	0.20	0.07	0.20	37.8
16	R2	All MCs	113	0.0	113	0.0	0.164	3.9	LOS A	0.8	19.9	0.20	0.07	0.20	37.8
Approach			201	5.2	201	5.2	0.164	4.2	LOS A	0.8	19.9	0.20	0.07	0.20	37.6
All Vehicles			1199	2.2	1199	2.2	0.565	8.5	LOS A	4.6	115.9	0.49	0.31	0.51	34.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: SANBELL | Licence: PLUS / 1PC | Processed: Monday, October 20, 2025 10:05:47 AM
Project: P:\23379_Yellowstone_County_West_Billings_Neighborhood_Plan\TRAFFIC\Capacity Calcs\Existing\Roundabouts\West Billings RABs Existing.sipx

MOVEMENT SUMMARY

Site: [103 (3)] Rimrock Rd & 62nd St PM (Existing)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 62nd Street West															
7	L2	All MCs	141	0.0	141	0.0	0.182	4.9	LOS A	0.9	21.6	0.40	0.24	0.40	35.6
4	T1	All MCs	53	0.0	53	0.0	0.182	4.9	LOS A	0.9	21.6	0.40	0.24	0.40	34.4
14	R2	All MCs	6	0.0	6	0.0	0.182	4.9	LOS A	0.9	21.6	0.40	0.24	0.40	35.8
Approach			200	0.0	200	0.0	0.182	4.9	LOS A	0.9	21.6	0.40	0.24	0.40	35.3
West: Rimrock Road															
5	L2	All MCs	2	0.0	2	0.0	0.111	4.2	LOS A	0.5	12.3	0.37	0.22	0.37	37.7
2	T1	All MCs	77	2.0	77	2.0	0.111	4.3	LOS A	0.5	12.3	0.37	0.22	0.37	40.4
12	R2	All MCs	40	0.0	40	0.0	0.111	4.2	LOS A	0.5	12.3	0.37	0.22	0.37	38.2
Approach			120	1.3	120	1.3	0.111	4.3	LOS A	0.5	12.3	0.37	0.22	0.37	39.6
South: 62nd Street West															
3	L2	All MCs	99	0.0	99	0.0	0.186	4.9	LOS A	0.9	22.2	0.40	0.24	0.40	36.1
8	T1	All MCs	88	0.0	88	0.0	0.186	4.9	LOS A	0.9	22.2	0.40	0.24	0.40	34.9
18	R2	All MCs	18	0.0	18	0.0	0.186	4.9	LOS A	0.9	22.2	0.40	0.24	0.40	36.4
Approach			205	0.0	205	0.0	0.186	4.9	LOS A	0.9	22.2	0.40	0.24	0.40	35.6
East: Rimrock Road															
1	L2	All MCs	30	0.0	30	0.0	0.347	6.5	LOS A	2.0	49.6	0.44	0.25	0.44	36.3
6	T1	All MCs	94	0.0	94	0.0	0.347	6.5	LOS A	2.0	49.6	0.44	0.25	0.44	39.1
16	R2	All MCs	271	0.0	271	0.0	0.347	6.5	LOS A	2.0	49.6	0.44	0.25	0.44	36.7
Approach			395	0.0	395	0.0	0.347	6.5	LOS A	2.0	49.6	0.44	0.25	0.44	37.2
All Vehicles			920	0.2	920	0.2	0.347	5.5	LOS A	2.0	49.6	0.41	0.24	0.41	36.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: P:\23379_Yellowstone_County_West_Billings_Neighborhood_Plan\TRAFFIC\Capacity Calcs\Existing\Roundabouts\West Billings RABs Existing.sipx

APPENDIX E

TRAFFIC GENERATION ASSUMPTIONS & WORKFLOW DIAGRAM

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FLUM ASSUMPTIONS & WORKFLOW DIAGRAM 366

TRAFFIC GENERATIONASSUMPTIONS & WORKFLOW DIAGRAM

Flowchart:

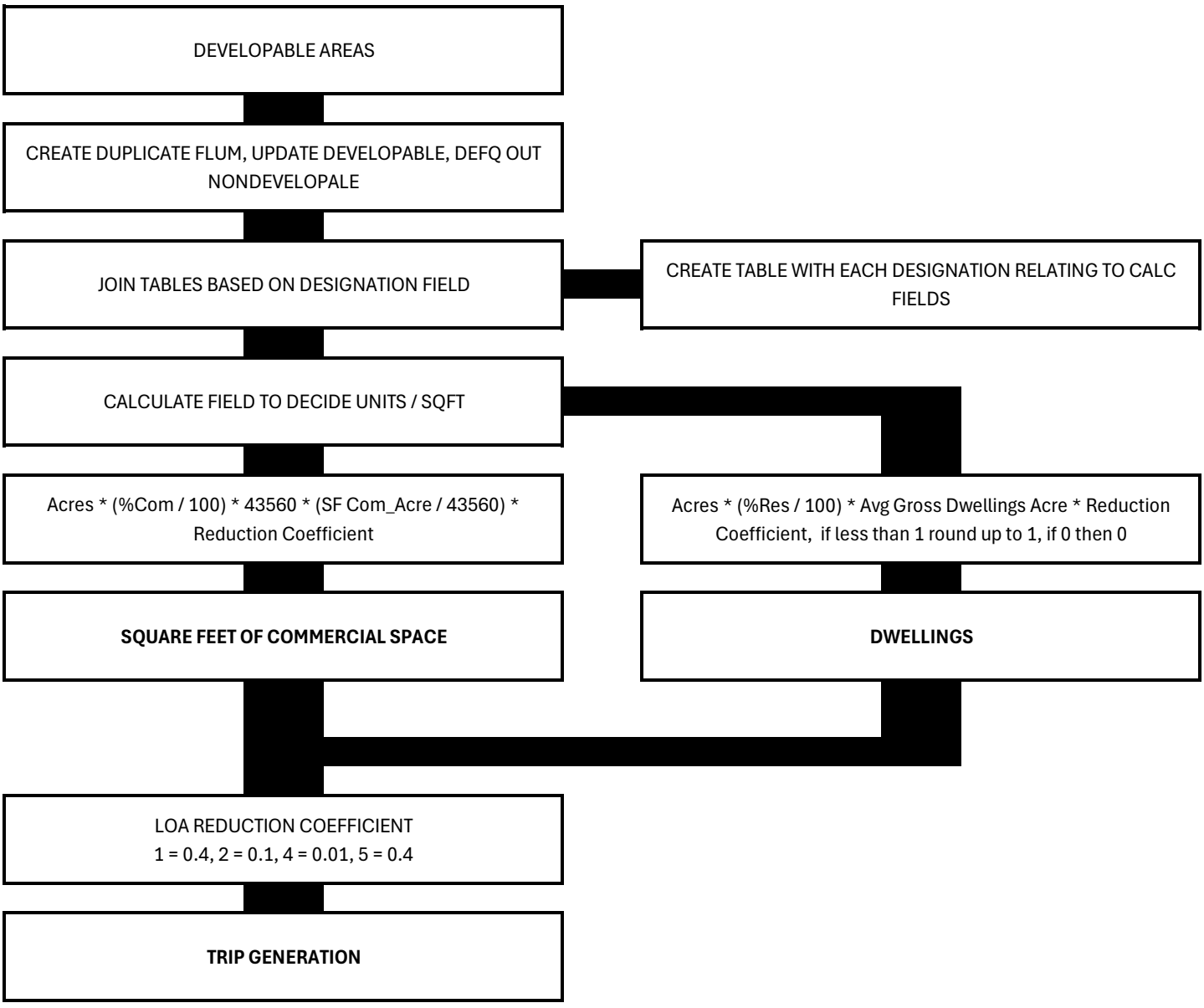

Figure E.1 Data Workflow

Category	% Com	% Res	Avg Gross Dwellings/ Acre	SF Com/ Acre
RRA	0.00	100%	0.25	-
CN	0	100%	0.35	-
URL	0.0	100%	3.40	-
UR	10%	90%	6.00	26,136
URM	20%	80%	7.00	21,780
UN	33%	67%	16.00	17,424
CM	80%	20%	6.00	14,375
DU	n/a	n/a	n/a	n/a
EI	100%	0%	n/a	14,375
OS	n/a	n/a	n/a	n/a
PI	n/a	n/a	n/a	10,890

Figure E.2 Trip Generation Assumptions

TRIP GENERATION SUMMARY

Figure E.3 Trip Generation Summary

(1)	Manufacturing - Land Use 140*	Units = 1000 SF GFA	
	Average Weekday:	Average Rate = 4.75	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 0.68	(76% entering/24% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 0.74	(31% entering/69% exiting)
(2)	Warehousing - Land Use 150*	Units = 1000 SF GFA	
	Average Weekday:	Average Rate = 1.71	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 0.17	(77% entering/23% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 0.18	(28% entering/72% exiting)
(3)	Single-Family Detached Housing - Land Use 210*	Units = Dwelling Units	
	Average Weekday:	Average Rate = 9.43	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 0.70	(25% entering/75% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 0.94	(63% entering/37% exiting)
(4)	Single-Family Attached Housing - Land Use 215*	Units = Dwelling Units	
	Average Weekday:	Average Rate = 7.20	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 0.48	(25% entering/75% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 0.57	(59% entering/41% exiting)
(5)	Multifamily Housing (Low-Rise) - Land Use 220*	Units = Dwelling Units	
	Average Weekday:	Average Rate = 6.74	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 0.40	(24% entering/76% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 0.51	(63% entering/37% exiting)
(6)	Low-Rise Residential with Ground-Floor Commercial - Land Use 230*	Units = Dwelling Units	
	Average Weekday:	Average Rate = 3.44	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 0.44	(23% entering/77% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 0.36	(71% entering/29% exiting)
(7)	High School - Land Use 525*	Units = Students	
	Average Weekday:	Average Rate = 1.94	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 0.52	(68% entering/32% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 0.14	(48% entering/52% exiting)
(8)	Clinic - Land Use 630*	Units = 1000 SF GFA	
	Average Weekday:	Average Rate = 37.6	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 2.75	(81% entering/19% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 3.69	(30% entering/70% exiting)
(9)	General Office Building - Land Use 710*	Units = 1000 SF GFA	
	Average Weekday:	Average Rate = 10.84	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 1.52	(88% entering/12% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 1.44	(17% entering/83% exiting)
(10)	Shopping Center (>150K) - Land Use 820*	Units = 1000 SF GFA	
	Average Weekday:	Average Rate = 37.01	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 0.84	(62% entering/38% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 3.40	(48% entering/52% exiting)
(11)	Strip Retail Plaza (<40K) - Land Use 822*	Units = 1000 SF GFA	
	Average Weekday:	Average Rate = 54.45	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 2.36	(60% entering/40% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 6.59	(50% entering/50% exiting)
(12)	Supermatket - Land Use 850*	Units = 1000 SF GFA	
	Average Weekday:	Average Rate = 93.84	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 2.86	(59% entering/41% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 8.95	(50% entering/50% exiting)
(13)	Drive-in Bank - Land Use 912*	Units = 1000 SF GFA	
	Average Weekday:	Average Rate = 100.35	(50% entering/50% exiting)
	Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:	Average Rate = 9.95	(58% entering/42% exiting)
	Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:	Average Rate = 21.01	(50% entering/50% exiting)

**Trip Generation, 11th Edition*, Institute of Transportation Engineers, 2021

***Trip Generation Handbook, 3rd Edition*, Institute of Transportation Engineers, 2017

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APPENDIX F

FUTURE (2044) CAPACITY CALCULATIONS

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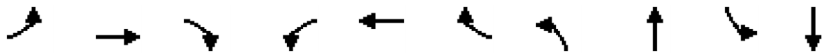
Future (2044) Capacity Calculations 372

Future (2044) Capacity Calculations

Future AM Capacity:

Queues
2: 54th Street West & Rimrock Road 10/07/2025



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	959	122	214	221	57	36	334	184	119
v/c Ratio	0.01	1.29	0.17	1.08	0.23	0.07	0.11	0.57	1.11	0.24
Control Delay (s/veh)	9.0	166.0	4.9	112.2	13.0	0.5	27.7	14.2	138.1	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.0	166.0	4.9	112.2	13.0	0.5	27.7	14.2	138.1	28.3
Queue Length 50th (ft)	1	~781	5	~109	63	0	17	53	~134	57
Queue Length 95th (ft)	4	#1022	37	#263	138	3	42	142	#271	103
Internal Link Dist (ft)		4323			924			5202		920
Turn Bay Length (ft)	250			250		250	200		150	
Base Capacity (vph)	306	746	708	199	942	798	320	588	166	496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	1.29	0.17	1.08	0.23	0.07	0.11	0.57	1.11	0.24

Intersection Summary

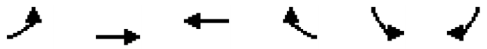
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	882	112	197	203	52	33	29	278	169	103	6
Future Volume (veh/h)	2	882	112	197	203	52	33	29	278	169	103	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	385	1723	1750	1723	1695	1600	1668	1750	1736	1709	1750	1750
Adj Flow Rate, veh/h	2	959	122	214	221	57	36	32	302	184	112	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	100	2	0	2	4	11	6	0	1	3	0	0
Cap, veh/h	180	749	645	211	877	701	358	41	388	156	464	29
Arrive On Green	0.00	0.44	0.44	0.09	0.52	0.52	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	367	1723	1483	1641	1695	1356	1232	144	1361	1038	1630	102
Grp Volume(v), veh/h	2	959	122	214	221	57	36	0	334	184	0	119
Grp Sat Flow(s),veh/h/ln	367	1723	1483	1641	1695	1356	1232	0	1505	1038	0	1732
Q Serve(g_s), s	0.3	43.5	5.1	8.5	7.2	2.1	2.3	0.0	20.4	8.1	0.0	5.3
Cycle Q Clear(g_c), s	0.3	43.5	5.1	8.5	7.2	2.1	7.6	0.0	20.4	28.5	0.0	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		0.06
Lane Grp Cap(c), veh/h	180	749	645	211	877	701	358	0	429	156	0	494
V/C Ratio(X)	0.01	1.28	0.19	1.01	0.25	0.08	0.10	0.00	0.78	1.18	0.00	0.24
Avail Cap(c_a), veh/h	210	749	645	211	877	701	358	0	429	156	0	494
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	15.9	28.3	17.4	28.6	13.4	12.2	30.4	0.0	32.9	47.8	0.0	27.4
Incr Delay (d2), s/veh	0.0	136.0	0.6	65.0	0.7	0.2	0.1	0.0	8.9	128.0	0.0	0.3
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	0.0	43.8	1.7	6.0	2.7	0.6	0.7	0.0	8.0	9.5	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.9	164.3	18.0	93.7	14.1	12.4	30.5	0.0	41.7	175.8	0.0	27.7
LnGrp LOS	B	F	B	F	B	B	C		D	F		C
Approach Vol, veh/h		1083			492			370			303	
Approach Delay, s/veh		147.5			48.5			40.6			117.7	
Approach LOS		F			D			D			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	50.0		35.0	6.8	58.2		35.0				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	8.5	43.5		28.5	8.5	43.5		28.5				
Max Q Clear Time (g_c+I1), s	10.5	45.5		30.5	2.3	9.2		22.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	1.4		1.1				

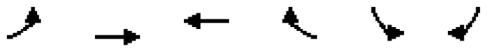
Intersection Summary		
HCM 7th Control Delay, s/veh		104.2
HCM 7th LOS		F



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	204	771	360	140	442	286
v/c Ratio	0.40	0.78	0.54	0.12	0.84	0.34
Control Delay (s/veh)	14.5	27.0	30.5	0.7	52.1	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	14.5	27.0	30.5	0.7	52.1	5.7
Queue Length 50th (ft)	70	432	203	0	289	25
Queue Length 95th (ft)	120	664	328	12	#533	87
Internal Link Dist (ft)		1579	3521		5202	
Turn Bay Length (ft)	400			400		250
Base Capacity (vph)	784	1437	671	1247	636	1194
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.54	0.54	0.11	0.69	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	188	709	331	129	407	263
Future Volume (veh/h)	188	709	331	129	407	263
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1736	1736	1668	1709	1736	1736
Adj Flow Rate, veh/h	204	771	360	140	442	286
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	6	3	1	1
Cap, veh/h	479	998	735	1070	493	570
Arrive On Green	0.09	0.57	0.44	0.44	0.30	0.30
Sat Flow, veh/h	1654	1736	1668	1448	1654	1471
Grp Volume(v), veh/h	204	771	360	140	442	286
Grp Sat Flow(s),veh/h/ln	1654	1736	1668	1448	1654	1471
Q Serve(g_s), s	6.3	33.7	15.3	2.8	25.4	14.7
Cycle Q Clear(g_c), s	6.3	33.7	15.3	2.8	25.4	14.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	479	998	735	1070	493	570
V/C Ratio(X)	0.43	0.77	0.49	0.13	0.90	0.50
Avail Cap(c_a), veh/h	1090	1640	735	1070	728	779
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	13.4	16.1	19.8	3.7	33.3	23.1
Incr Delay (d2), s/veh	0.6	1.3	2.3	0.3	10.0	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	11.6	5.9	1.9	10.9	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	14.0	17.4	22.1	4.0	43.3	23.8
LnGrp LOS	B	B	C	A	D	C
Approach Vol, veh/h		975	500		728	
Approach Delay, s/veh		16.7	17.1		35.7	
Approach LOS		B	B		D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		63.3		35.9	13.3	50.0
Change Period (Y+Rc), s		6.3		6.3	4.5	6.3
Max Green Setting (Gmax), s		93.7		43.7	45.5	43.7
Max Q Clear Time (g_c+I1), s		35.7		27.4	8.3	17.3
Green Ext Time (p_c), s		5.9		2.2	0.6	2.5
Intersection Summary						
HCM 7th Control Delay, s/veh			23.1			
HCM 7th LOS			C			

Lane Group	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	1229	176	549	57	196
v/c Ratio	0.90	0.96	0.40	0.51	0.60
Control Delay (s/veh)	18.9	72.7	4.1	64.5	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	18.9	72.7	4.1	64.5	13.0
Queue Length 50th (ft)	460	83	83	40	0
Queue Length 95th (ft)	#1176	#149	161	84	53
Internal Link Dist (ft)	3542		1579		5173
Turn Bay Length (ft)		200		200	
Base Capacity (vph)	1368	184	1389	178	387
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.90	0.96	0.40	0.32	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	884	247	162	505	0	52	0	180	0	0	0
Future Volume (veh/h)	0	884	247	162	505	0	52	0	180	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1695	1641	1709	1750	1600	1750	1627	1750	1750	1750
Adj Flow Rate, veh/h	0	961	268	176	549	0	57	0	196	0	0	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, %	0	1	4	8	3	0	11	0	9	0	0	0
Cap, veh/h	60	1012	282	124	1325	0	276	0	210	0	248	0
Arrive On Green	0.00	0.77	0.77	0.77	0.77	0.00	0.14	0.00	0.14	0.00	0.00	0.00
Sat Flow, veh/h	872	1306	364	432	1709	0	1524	0	1483	0	1750	0
Grp Volume(v), veh/h	0	0	1229	176	549	0	57	0	196	0	0	0
Grp Sat Flow(s),veh/h/ln	872	0	1671	432	1709	0	1524	0	1483	0	1750	0
Q Serve(g_s), s	0.0	0.0	75.1	17.9	12.8	0.0	4.0	0.0	15.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	75.1	93.0	12.8	0.0	4.0	0.0	15.7	0.0	0.0	0.0
Prop In Lane	1.00		0.22	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	60	0	1295	124	1325	0	276	0	210	0	248	0
V/C Ratio(X)	0.00	0.00	0.95	1.42	0.41	0.00	0.21	0.00	0.93	0.00	0.00	0.00
Avail Cap(c_a), veh/h	60	0	1295	124	1325	0	276	0	210	0	248	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)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	11.5	55.4	4.5	0.0	45.9	0.0	50.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	14.6	227.3	0.2	0.0	0.4	0.0	43.6	0.0	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	0.0	0.0	25.6	11.6	3.6	0.0	1.5	0.0	8.3	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	26.1	282.7	4.7	0.0	46.3	0.0	94.5	0.0	0.0	0.0
LnGrp LOS			C	F	A		D		F			
Approach Vol, veh/h		1229			725			253			0	
Approach Delay, s/veh		26.1			72.2			83.7			0.0	
Approach LOS		C			E			F				

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.0	98.0	22.0	98.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	17.0	93.0	17.0	93.0
Max Q Clear Time (g_c+I1), s	17.7	77.1	0.0	95.0
Green Ext Time (p_c), s	0.0	9.9	0.0	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	47.8
HCM 7th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1398	683	70	183	28
v/c Ratio	1.33	1.11	0.33	0.63	0.11
Control Delay (s/veh)	171.7	88.4	28.6	30.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	171.7	88.4	28.6	30.3	23.9
Queue Length 50th (ft)	~783	~335	26	56	10
Queue Length 95th (ft)	#1137	#589	59	116	30
Internal Link Dist (ft)	3521	424	5188		424
Turn Bay Length (ft)				120	
Base Capacity (vph)	1054	615	774	972	897
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.33	1.11	0.09	0.19	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	1057	190	122	436	70	48	17	168	17	9	0
Future Volume (veh/h)	39	1057	190	122	436	70	48	17	168	17	9	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1736	1723	1695	1750	1545	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	42	1149	207	133	474	76	52	18	183	18	10	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, %	0	1	1	2	4	0	15	0	0	0	0	0
Cap, veh/h	73	890	158	135	419	61	266	78	240	198	90	0
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.16	0.16	0.16	0.16	0.16	0.00
Sat Flow, veh/h	27	1367	242	109	643	94	1064	480	1483	676	555	0
Grp Volume(v), veh/h	1398	0	0	683	0	0	70	0	183	28	0	0
Grp Sat Flow(s),veh/h/ln	1636	0	0	846	0	0	1545	0	1483	1231	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	43.6	0.0	0.0	43.6	0.0	0.0	2.4	0.0	7.9	2.4	0.0	0.0
Prop In Lane	0.03		0.15	0.19		0.11	0.74		1.00	0.64		0.00
Lane Grp Cap(c), veh/h	1121	0	0	615	0	0	344	0	240	288	0	0
V/C Ratio(X)	1.25	0.00	0.00	1.11	0.00	0.00	0.20	0.00	0.76	0.10	0.00	0.00
Avail Cap(c_a), veh/h	1121	0	0	615	0	0	1084	0	973	955	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.4	0.0	0.0	10.7	0.0	0.0	24.5	0.0	26.8	23.9	0.0	0.0
Incr Delay (d2), s/veh	118.7	0.0	0.0	70.5	0.0	0.0	0.3	0.0	5.0	0.1	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	48.6	0.0	0.0	15.3	0.0	0.0	0.9	0.0	2.9	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	131.2	0.0	0.0	81.1	0.0	0.0	24.8	0.0	31.8	24.1	0.0	0.0
LnGrp LOS	F			F			C		C	C		
Approach Vol, veh/h		1398			683			253			28	
Approach Delay, s/veh		131.2			81.1			29.9			24.1	
Approach LOS		F			F			C			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	16.9	50.0	16.9	50.0
Change Period (Y+Rc), s	6.1	6.4	6.1	6.4
Max Green Setting (Gmax), s	43.9	43.6	43.9	43.6
Max Q Clear Time (g_c+I1), s	9.9	45.6	4.4	45.6
Green Ext Time (p_c), s	1.0	0.0	0.1	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	104.6
HCM 7th LOS	F

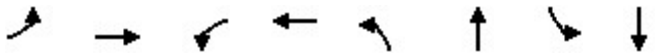
Intersection	
Int Delay, s/veh	6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	236	88	168	81	55	140
Future Vol, veh/h	236	88	168	81	55	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	2	7	10	0
Mvmt Flow	257	96	183	88	60	152

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	352	0	758	304
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	453	-
Critical Hdwy	-	-	4.12	-	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	-	-	2.218	-	3.59	3.3
Pot Cap-1 Maneuver	-	-	1207	-	364	740
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1207	-	306	740
Mov Cap-2 Maneuver	-	-	-	-	306	-
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	524	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	5.74	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	529	-	-	1148	-
HCM Lane V/C Ratio	0.401	-	-	0.151	-
HCM Ctrl Dly (s/v)	16.3	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.9	-	-	0.5	-



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	474	28	210	16	176	140	164
v/c Ratio	0.05	0.67	0.10	0.31	0.05	0.32	0.39	0.30
Control Delay (s/veh)	6.7	13.4	7.4	7.4	8.3	6.1	12.5	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	6.7	13.4	7.4	7.4	8.3	6.1	12.5	8.9
Queue Length 50th (ft)	2	47	2	17	2	9	17	16
Queue Length 95th (ft)	11	#163	14	60	10	38	50	46
Internal Link Dist (ft)		5200		420		5201		5188
Turn Bay Length (ft)	150		150		150		150	
Base Capacity (vph)	601	938	385	911	554	894	619	949
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.51	0.07	0.23	0.03	0.20	0.23	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	368	68	26	173	20	15	72	90	129	129	22
Future Volume (veh/h)	20	368	68	26	173	20	15	72	90	129	129	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1709	1750	1709	1504	1573	1682	1723	1750	1750	1750
Adj Flow Rate, veh/h	22	400	74	28	188	22	16	78	98	140	140	24
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, %	0	1	3	0	3	18	13	5	2	0	0	0
Cap, veh/h	633	545	101	415	575	67	538	206	258	544	442	76
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1190	1425	264	934	1502	176	1115	677	851	1228	1456	250
Grp Volume(v), veh/h	22	0	474	28	0	210	16	0	176	140	0	164
Grp Sat Flow(s),veh/h/ln	1190	0	1689	934	0	1677	1115	0	1529	1228	0	1705
Q Serve(g_s), s	0.3	0.0	6.1	0.7	0.0	2.3	0.3	0.0	2.3	2.6	0.0	1.9
Cycle Q Clear(g_c), s	2.6	0.0	6.1	6.8	0.0	2.3	2.2	0.0	2.3	4.9	0.0	1.9
Prop In Lane	1.00		0.16	1.00		0.10	1.00		0.56	1.00		0.15
Lane Grp Cap(c), veh/h	633	0	646	415	0	642	538	0	464	544	0	518
V/C Ratio(X)	0.03	0.00	0.73	0.07	0.00	0.33	0.03	0.00	0.38	0.26	0.00	0.32
Avail Cap(c_a), veh/h	924	0	1060	644	0	1052	899	0	959	941	0	1070
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.5	0.0	6.8	9.7	0.0	5.6	7.7	0.0	7.0	8.9	0.0	6.8
Incr Delay (d2), s/veh	0.0	0.0	1.6	0.1	0.0	0.3	0.0	0.0	0.5	0.2	0.0	0.3
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	0.0	0.0	0.7	0.1	0.0	0.2	0.0	0.0	0.3	0.4	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.5	0.0	8.4	9.7	0.0	5.8	7.7	0.0	7.5	9.2	0.0	7.2
LnGrp LOS	A		A	A		A	A		A	A		A
Approach Vol, veh/h		496			238			192			304	
Approach Delay, s/veh		8.3			6.3			7.5			8.1	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	11.7	13.8	11.7	13.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	16.0	16.0	16.0
Max Q Clear Time (g_c+I1), s	4.3	8.1	6.9	8.8
Green Ext Time (p_c), s	0.7	1.7	0.8	0.6

Intersection Summary	
HCM 7th Control Delay, s/veh	7.7
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	26	179	57	77	180
Future Vol, veh/h	55	26	179	57	77	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	7	1	0	2	4
Mvmt Flow	60	28	195	62	84	196

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	589	226	0	0	257	0
Stage 1	226	-	-	-	-	-
Stage 2	363	-	-	-	-	-
Critical Hdwy	6.43	6.27	-	-	4.12	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.363	-	-	2.218	-
Pot Cap-1 Maneuver	469	802	-	-	1308	-
Stage 1	810	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	436	802	-	-	1308	-
Mov Cap-2 Maneuver	436	-	-	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	651	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	13.52	0	2.38
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	511	539	-
HCM Lane V/C Ratio	-	-	0.172	0.064	-
HCM Ctrl Dly (s/v)	-	-	13.5	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-

Intersection	
Int Delay, s/veh	12.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	440	9	15	153	31	9	52	24	120	52	22
Future Vol, veh/h	31	440	9	15	153	31	9	52	24	120	52	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	5	0	0	10	6	20	4	8	2	4	8
Mvmt Flow	34	478	10	16	166	34	10	57	26	130	57	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	200	0	0	488	0	0	778	783	483	790	771	183
Stage 1	-	-	-	-	-	-	551	551	-	216	216	-
Stage 2	-	-	-	-	-	-	227	233	-	574	555	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.3	6.54	6.28	7.12	6.54	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.54	-	6.12	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.54	-	6.12	5.54	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.68	4.036	3.372	3.518	4.036	3.372
Pot Cap-1 Maneuver	1349	-	-	1086	-	-	293	323	571	308	328	844
Stage 1	-	-	-	-	-	-	488	512	-	786	720	-
Stage 2	-	-	-	-	-	-	737	708	-	504	510	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1349	-	-	1086	-	-	223	307	571	230	312	844
Mov Cap-2 Maneuver	-	-	-	-	-	-	223	307	-	230	312	-
Stage 1	-	-	-	-	-	-	471	495	-	773	708	-
Stage 2	-	-	-	-	-	-	647	696	-	411	492	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.5	0.63	19.64	52.76
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	337	116	-	-	131	-	-	271
HCM Lane V/C Ratio	0.274	0.025	-	-	0.015	-	-	0.777
HCM Ctrl Dly (s/v)	19.6	7.7	0	-	8.4	0	-	52.8
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0	-	-	5.9

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	188	2	37	120	24	13	70	64	37	76	29
Future Vol, veh/h	18	188	2	37	120	24	13	70	64	37	76	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	11	0	6	15	23	29	18	34	5	32	6
Mvmt Flow	20	204	2	40	130	26	14	76	70	40	83	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	348	353	98	404	334	111	114	0	0	146	0	0
Stage 1	179	179	-	139	139	-	-	-	-	-	-	-
Stage 2	170	174	-	265	195	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.61	6.2	7.16	6.65	6.43	4.39	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.61	-	6.16	5.65	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.61	-	6.16	5.65	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.099	3.3	3.554	4.135	3.507	2.461	-	-	2.245	-	-
Pot Cap-1 Maneuver	610	558	963	550	566	888	1323	-	-	1418	-	-
Stage 1	828	735	-	854	757	-	-	-	-	-	-	-
Stage 2	837	738	-	731	716	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	435	535	963	330	542	888	1323	-	-	1418	-	-
Mov Cap-2 Maneuver	435	535	-	330	542	-	-	-	-	-	-	-
Stage 1	803	712	-	844	748	-	-	-	-	-	-	-
Stage 2	663	730	-	505	694	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	16.88	16.71	0.69	1.98
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	145	-	-	527	502	444	-	-
HCM Lane V/C Ratio	0.011	-	-	0.429	0.392	0.028	-	-
HCM Ctrl Dly (s/v)	7.8	0	-	16.9	16.7	7.6	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.1	1.8	0.1	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	361	0	33	228	33	0	22	74	41	15	17
Future Vol, veh/h	18	361	0	33	228	33	0	22	74	41	15	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	12	0	0	20	6	0	0	5	5	13	0
Mvmt Flow	20	392	0	36	248	36	0	24	80	45	16	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	284	0	0	392	0	0	759	787	392	781	769	266
Stage 1	-	-	-	-	-	-	432	432	-	337	337	-
Stage 2	-	-	-	-	-	-	328	355	-	443	432	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.25	7.15	6.63	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.63	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.63	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.345	3.545	4.117	3.3
Pot Cap-1 Maneuver	1290	-	-	1177	-	-	325	326	650	309	319	778
Stage 1	-	-	-	-	-	-	606	586	-	671	622	-
Stage 2	-	-	-	-	-	-	689	633	-	588	564	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1290	-	-	1177	-	-	285	308	650	237	301	778
Mov Cap-2 Maneuver	-	-	-	-	-	-	285	308	-	237	301	-
Stage 1	-	-	-	-	-	-	594	575	-	646	599	-
Stage 2	-	-	-	-	-	-	631	610	-	484	553	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.37	0.92	13.69	21.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	518	85	-	-	197	-	-	298
HCM Lane V/C Ratio	0.201	0.015	-	-	0.03	-	-	0.266
HCM Ctrl Dly (s/v)	13.7	7.8	0	-	8.2	0	-	21.4
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	1

Intersection	
Int Delay, s/veh	22.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	57	291	168	61	298	94
Future Vol, veh/h	57	291	168	61	298	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	7	12	1	0
Mvmt Flow	62	316	183	66	324	102

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	249	0	-	0	656	216
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	440	-
Critical Hdwy	4.1	-	-	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.3
Pot Cap-1 Maneuver	1329	-	-	-	432	829
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1329	-	-	-	407	829
Mov Cap-2 Maneuver	-	-	-	-	407	-
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	1.28	0	53.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	295	-	-	-	464
HCM Lane V/C Ratio	0.047	-	-	-	0.918
HCM Ctrl Dly (s/v)	7.8	0	-	-	53.9
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	10.5

Intersection	
Int Delay, s/veh	6.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	7	28	11	39	52
Future Vol, veh/h	24	7	28	11	39	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	25	0	0	0	0
Mvmt Flow	26	8	30	12	42	57

Major/Minor	Major1		Minor2	
Conflicting Flow All	0	0	30	42
Stage 1	-	-	0	0
Stage 2	-	-	30	42
Critical Hdwy	-	-	6.4	6.5
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.4	5.5
Follow-up Hdwy	-	-	3.5	4
Pot Cap-1 Maneuver	-	-	989	853
Stage 1	-	-	-	-
Stage 2	-	-	997	864
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	989	0
Mov Cap-2 Maneuver	-	-	989	0
Stage 1	-	-	-	0
Stage 2	-	-	997	0

Approach	NB	SB
HCM Ctrl Dly, s/v	0	9.04
HCM LOS		A

Minor Lane/Major Mvmt	NBT	NBR	SBLn1
Capacity (veh/h)	-	-	989
HCM Lane V/C Ratio	-	-	0.1
HCM Ctrl Dly (s/v)	-	-	9
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.3

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1335	68	37	460	15	74
Future Vol, veh/h	1335	68	37	460	15	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	3	0	3	0	3
Mvmt Flow	1451	74	40	500	16	80

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1525	0	2068	1488
Stage 1	-	-	-	-	1488	-
Stage 2	-	-	-	-	580	-
Critical Hdwy	-	-	4.1	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.327
Pot Cap-1 Maneuver	-	-	443	-	60	152
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	564	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	443	-	55	152
Mov Cap-2 Maneuver	-	-	-	-	155	-
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	512	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	1.04	62.77
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	152	-	-	443	-
HCM Lane V/C Ratio	0.635	-	-	0.091	-
HCM Ctrl Dly (s/v)	62.8	-	-	13.9	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	3.5	-	-	0.3	-

Intersection	
Int Delay, s/veh	46.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	123	278	387	158	147	193
Future Vol, veh/h	123	278	387	158	147	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	13	1	10	5	3	19
Mvmt Flow	134	302	421	172	160	210

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1036	507	0	0	592	0
Stage 1	507	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Critical Hdwy	6.53	6.21	-	-	4.13	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.309	-	-	2.227	-
Pot Cap-1 Maneuver	245	568	-	-	979	-
Stage 1	583	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	199	568	-	-	979	-
Mov Cap-2 Maneuver	199	-	-	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	464	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	146.8	0	4.06
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	362	778	-
HCM Lane V/C Ratio	-	-	1.202	0.163	-
HCM Ctrl Dly (s/v)	-	-	146.8	9.4	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	18.2	0.6	-

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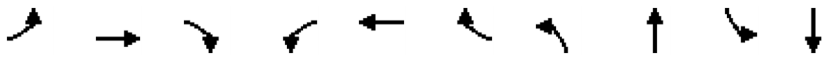
Future PM Capacity:

Queues
2: 54th Street West & Rimrock Road 10/07/2025



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	347	38	272	723	157	145	289	118	66
v/c Ratio	0.01	0.41	0.05	0.47	0.66	0.16	0.56	0.68	1.03	0.18
Control Delay (s/veh)	8.5	18.5	0.1	11.5	18.2	2.9	40.1	25.8	126.8	26.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	8.5	18.5	0.1	11.5	18.2	2.9	40.1	25.8	126.8	26.9
Queue Length 50th (ft)	1	125	0	60	227	1	75	81	68	28
Queue Length 95th (ft)	6	231	0	127	#648	36	134	166	#165	61
Internal Link Dist (ft)		4323			924			5202		920
Turn Bay Length (ft)	250			250		250	200		150	
Base Capacity (vph)	401	845	775	579	1089	983	395	573	176	548
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.41	0.05	0.47	0.66	0.16	0.37	0.50	0.67	0.12

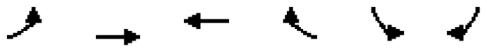
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	319	35	250	665	144	133	74	192	109	53	7
Future Volume (veh/h)	4	319	35	250	665	144	133	74	192	109	53	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1750
Adj Flow Rate, veh/h	4	347	38	272	723	157	145	80	209	118	58	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	3	3	0	0
Cap, veh/h	192	761	645	513	901	763	420	122	319	203	429	59
Arrive On Green	0.01	0.44	0.44	0.09	0.51	0.51	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1667	1750	1483	1667	1750	1483	1357	429	1120	1082	1505	208
Grp Volume(v), veh/h	4	347	38	272	723	157	145	0	289	118	0	66
Grp Sat Flow(s),veh/h/ln	1667	1750	1483	1667	1750	1483	1357	0	1548	1082	0	1713
Q Serve(g_s), s	0.1	14.0	1.5	8.5	34.2	5.7	8.9	0.0	16.4	10.8	0.0	2.9
Cycle Q Clear(g_c), s	0.1	14.0	1.5	8.5	34.2	5.7	11.8	0.0	16.4	27.2	0.0	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.72	1.00		0.12
Lane Grp Cap(c), veh/h	192	761	645	513	901	763	420	0	441	203	0	488
V/C Ratio(X)	0.02	0.46	0.06	0.53	0.80	0.21	0.35	0.00	0.65	0.58	0.00	0.14
Avail Cap(c_a), veh/h	325	761	645	513	901	763	420	0	441	203	0	488
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	19.2	19.9	16.4	14.9	20.1	13.2	31.0	0.0	31.4	43.4	0.0	26.6
Incr Delay (d2), s/veh	0.0	2.0	0.2	1.0	7.5	0.6	0.5	0.0	3.5	4.2	0.0	0.1
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	0.0	5.5	0.5	3.1	14.1	1.9	2.8	0.0	6.2	3.1	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.2	21.9	16.6	16.0	27.6	13.8	31.4	0.0	34.9	47.5	0.0	26.7
LnGrp LOS	B	C	B	B	C	B	C		C	D		C
Approach Vol, veh/h		389			1152			434			184	
Approach Delay, s/veh		21.3			22.9			33.7			40.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	50.0		35.0	7.0	58.0		35.0				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	8.5	43.5		28.5	8.5	43.5		28.5				
Max Q Clear Time (g_c+I1), s	10.5	16.0		29.2	2.1	36.2		18.4				
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	3.0		1.5				

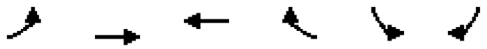
Intersection Summary		
HCM 7th Control Delay, s/veh		26.3
HCM 7th LOS		C



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	226	390	707	324	248	180
v/c Ratio	0.55	0.33	0.92	0.29	0.76	0.26
Control Delay (s/veh)	18.6	8.5	48.6	1.4	54.1	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	18.6	8.5	48.6	1.4	54.1	13.0
Queue Length 50th (ft)	57	92	413	0	150	52
Queue Length 95th (ft)	155	185	#860	29	260	93
Internal Link Dist (ft)		1579	3521		5202	
Turn Bay Length (ft)	400			400		250
Base Capacity (vph)	789	1608	765	1379	720	1080
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.24	0.92	0.23	0.34	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	208	359	650	298	228	166
Future Volume (veh/h)	208	359	650	298	228	166
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1723	1750	1750	1736	1736	1750
Adj Flow Rate, veh/h	226	390	707	324	248	180
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	0	1	1	0
Cap, veh/h	342	1165	915	1039	303	404
Arrive On Green	0.09	0.67	0.52	0.52	0.18	0.18
Sat Flow, veh/h	1641	1750	1750	1471	1654	1483
Grp Volume(v), veh/h	226	390	707	324	248	180
Grp Sat Flow(s),veh/h/ln	1641	1750	1750	1471	1654	1483
Q Serve(g_s), s	4.9	8.0	27.0	6.9	12.0	8.4
Cycle Q Clear(g_c), s	4.9	8.0	27.0	6.9	12.0	8.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	342	1165	915	1039	303	404
V/C Ratio(X)	0.66	0.33	0.77	0.31	0.82	0.45
Avail Cap(c_a), veh/h	1088	1961	915	1039	864	908
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	14.9	6.0	16.0	4.6	32.8	25.2
Incr Delay (d2), s/veh	2.2	0.2	6.3	0.8	5.4	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.2	10.5	3.3	4.9	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	17.1	6.2	22.3	5.4	38.2	25.9
LnGrp LOS	B	A	C	A	D	C
Approach Vol, veh/h		616	1031		428	
Approach Delay, s/veh		10.2	17.0		33.0	
Approach LOS		B	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		62.0		21.6	12.0	50.0
Change Period (Y+Rc), s		6.3		6.3	4.5	6.3
Max Green Setting (Gmax), s		93.7		43.7	45.5	43.7
Max Q Clear Time (g_c+I1), s		10.0		14.0	6.9	29.0
Green Ext Time (p_c), s		2.3		1.3	0.6	4.9

Intersection Summary	
HCM 7th Control Delay, s/veh	18.3
HCM 7th LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	722	214	683	152	348
v/c Ratio	0.70	0.74	0.64	0.52	0.61
Control Delay (s/veh)	13.2	27.9	11.8	36.5	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.2	27.9	11.8	36.5	11.0
Queue Length 50th (ft)	158	50	145	53	11
Queue Length 95th (ft)	383	199	342	161	108
Internal Link Dist (ft)	3542		1579		5173
Turn Bay Length (ft)		200		200	
Base Capacity (vph)	1516	428	1571	772	979
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.43	0.20	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	552	112	197	628	0	140	0	320	0	0	0
Future Volume (veh/h)	0	552	112	197	628	0	140	0	320	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1723	1723	1750	1750	1736	1750	1709	1750	1750	1750
Adj Flow Rate, veh/h	0	600	122	214	683	0	152	0	348	0	0	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, %	0	1	2	2	0	0	1	0	3	0	0	0
Cap, veh/h	74	883	180	332	1103	0	515	0	395	0	467	0
Arrive On Green	0.00	0.63	0.63	0.63	0.63	0.00	0.27	0.00	0.27	0.00	0.00	0.00
Sat Flow, veh/h	770	1400	285	731	1750	0	1654	0	1483	0	1750	0
Grp Volume(v), veh/h	0	0	722	214	683	0	152	0	348	0	0	0
Grp Sat Flow(s),veh/h/ln	770	0	1685	731	1750	0	1654	0	1483	0	1750	0
Q Serve(g_s), s	0.0	0.0	26.9	26.0	23.0	0.0	7.2	0.0	21.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	26.9	52.9	23.0	0.0	7.2	0.0	21.8	0.0	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	74	0	1062	332	1103	0	515	0	395	0	467	0
V/C Ratio(X)	0.00	0.00	0.68	0.64	0.62	0.00	0.30	0.00	0.88	0.00	0.00	0.00
Avail Cap(c_a), veh/h	183	0	1301	436	1351	0	670	0	534	0	631	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)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	11.6	28.7	10.9	0.0	28.8	0.0	34.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.1	2.1	0.6	0.0	0.3	0.0	12.3	0.0	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	0.0	0.0	9.0	4.5	7.9	0.0	2.8	0.0	8.9	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	12.7	30.8	11.5	0.0	29.1	0.0	46.5	0.0	0.0	0.0
LnGrp LOS			B	C	B		C		D			
Approach Vol, veh/h		722			897			500			0	
Approach Delay, s/veh		12.7			16.1			41.2			0.0	
Approach LOS		B			B			D				

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	30.9	66.2	30.9	66.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	35.0	75.0	35.0	75.0
Max Q Clear Time (g_c+I1), s	23.8	28.9	0.0	54.9
Green Ext Time (p_c), s	2.1	6.0	0.0	6.3

Intersection Summary	
HCM 7th Control Delay, s/veh	20.8
HCM 7th LOS	C

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	702	1364	171	118	9
v/c Ratio	0.67	2.17	0.65	0.30	0.03
Control Delay (s/veh)	13.5	548.2	37.5	7.0	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.5	548.2	37.5	7.0	21.6
Queue Length 50th (ft)	169	~968	68	0	3
Queue Length 95th (ft)	359	#1332	127	37	14
Internal Link Dist (ft)	3521	424	5188		424
Turn Bay Length (ft)				120	
Base Capacity (vph)	1055	629	812	972	855
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	2.17	0.21	0.12	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	543	103	206	1040	9	157	0	109	6	2	0
Future Volume (veh/h)	0	543	103	206	1040	9	157	0	109	6	2	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1750	1750	1750	1750	1736	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	0	590	112	224	1130	10	171	0	118	7	2	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, %	0	1	0	0	0	0	1	0	0	0	0	0
Cap, veh/h	0	922	175	157	561	5	341	0	243	148	30	0
Arrive On Green	0.00	0.65	0.65	0.65	0.65	0.65	0.16	0.00	0.16	0.16	0.16	0.00
Sat Flow, veh/h	0	1419	269	145	864	7	1423	0	1483	322	183	0
Grp Volume(v), veh/h	0	0	702	1364	0	0	171	0	118	9	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1688	1017	0	0	1423	0	1483	504	0	0
Q Serve(g_s), s	0.0	0.0	16.7	26.9	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	16.7	43.6	0.0	0.0	7.7	0.0	4.8	7.7	0.0	0.0
Prop In Lane	0.00		0.16	0.16		0.01	1.00		1.00	0.78		0.00
Lane Grp Cap(c), veh/h	0	0	1096	723	0	0	341	0	243	178	0	0
V/C Ratio(X)	0.00	0.00	0.64	1.89	0.00	0.00	0.50	0.00	0.48	0.05	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1096	723	0	0	1045	0	970	851	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)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	7.1	17.9	0.0	0.0	26.7	0.0	25.5	23.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.9	404.3	0.0	0.0	1.1	0.0	1.5	0.1	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	0.0	0.0	5.0	91.3	0.0	0.0	2.5	0.0	1.7	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	9.9	422.2	0.0	0.0	27.8	0.0	27.0	24.1	0.0	0.0
LnGrp LOS			A	F			C		C	C		
Approach Vol, veh/h		702			1364			289			9	
Approach Delay, s/veh		9.9			422.2			27.5			24.1	
Approach LOS		A			F			C			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	17.1	50.0	17.1	50.0
Change Period (Y+Rc), s	6.1	6.4	6.1	6.4
Max Green Setting (Gmax), s	43.9	43.6	43.9	43.6
Max Q Clear Time (g_c+I1), s	9.7	18.7	9.7	45.6
Green Ext Time (p_c), s	1.4	5.2	0.0	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	250.0
HCM 7th LOS	F

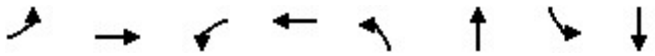
Intersection	
Int Delay, s/veh	8.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	157	42	180	243	90	204
Future Vol, veh/h	157	42	180	243	90	204
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	2	0
Mvmt Flow	171	46	196	264	98	222

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	216	0	849	193
Stage 1	-	-	-	-	193	-
Stage 2	-	-	-	-	655	-
Critical Hdwy	-	-	4.1	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.3
Pot Cap-1 Maneuver	-	-	1365	-	331	853
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	517	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1365	-	276	853
Mov Cap-2 Maneuver	-	-	-	-	276	-
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	430	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	3.44	22.35
HCM LOS			C

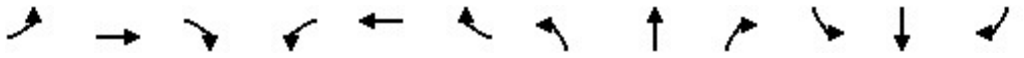
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	520	-	-	766	-
HCM Lane V/C Ratio	0.615	-	-	0.143	-
HCM Ctrl Dly (s/v)	22.3	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	4.1	-	-	0.5	-



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	322	57	611	92	216	72	166
v/c Ratio	0.12	0.41	0.12	0.76	0.29	0.43	0.24	0.34
Control Delay (s/veh)	7.4	7.8	6.6	16.8	11.8	10.6	11.1	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.4	7.8	6.6	16.8	11.8	10.6	11.1	10.4
Queue Length 50th (ft)	2	28	4	65	13	24	10	20
Queue Length 95th (ft)	14	85	20	#246	34	57	28	48
Internal Link Dist (ft)		5200		420		5201		5188
Turn Bay Length (ft)	150		150		150		150	
Base Capacity (vph)	268	864	507	884	585	889	559	884
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.37	0.11	0.69	0.16	0.24	0.13	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	261	35	52	464	98	85	155	44	66	134	18
Future Volume (veh/h)	28	261	35	52	464	98	85	155	44	66	134	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1709	1682	1750	1750	1695	1750	1750	1750	1750	1736	1750
Adj Flow Rate, veh/h	30	284	38	57	504	107	92	168	48	72	146	20
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, %	0	3	5	0	0	4	0	0	0	0	1	0
Cap, veh/h	376	664	89	603	630	134	484	341	98	440	390	53
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	823	1476	197	1075	1399	297	1239	1309	374	1184	1495	205
Grp Volume(v), veh/h	30	0	322	57	0	611	92	0	216	72	0	166
Grp Sat Flow(s),veh/h/ln	823	0	1674	1075	0	1697	1239	0	1683	1184	0	1699
Q Serve(g_s), s	0.9	0.0	3.6	1.1	0.0	8.6	1.8	0.0	3.0	1.5	0.0	2.2
Cycle Q Clear(g_c), s	9.5	0.0	3.6	4.7	0.0	8.6	4.0	0.0	3.0	4.5	0.0	2.2
Prop In Lane	1.00		0.12	1.00		0.18	1.00		0.22	1.00		0.12
Lane Grp Cap(c), veh/h	376	0	753	603	0	763	484	0	439	440	0	443
V/C Ratio(X)	0.08	0.00	0.43	0.09	0.00	0.80	0.19	0.00	0.49	0.16	0.00	0.37
Avail Cap(c_a), veh/h	482	0	968	741	0	981	878	0	973	816	0	983
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.6	0.0	5.2	6.8	0.0	6.5	10.0	0.0	8.7	10.6	0.0	8.4
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.1	0.0	3.7	0.2	0.0	0.9	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	0.1	0.0	0.3	0.1	0.0	1.4	0.3	0.0	0.6	0.2	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	10.7	0.0	5.6	6.8	0.0	10.3	10.2	0.0	9.5	10.8	0.0	8.9
LnGrp LOS	B		A	A		B	B		A	B		A
Approach Vol, veh/h		352			668			308			238	
Approach Delay, s/veh		6.0			10.0			9.7			9.5	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.2		16.4		11.2		16.4				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		16.0		16.0		16.0		16.0				
Max Q Clear Time (g_c+I1), s		6.0		11.5		6.5		10.6				
Green Ext Time (p_c), s		0.9		0.7		0.7		1.9				

Intersection Summary	
HCM 7th Control Delay, s/veh	9.0
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	101	64	273	64	20	197
Future Vol, veh/h	101	64	273	64	20	197
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	110	70	297	70	22	214

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	589	332	0	0	366	0
Stage 1	332	-	-	-	-	-
Stage 2	258	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	474	715	-	-	1203	-
Stage 1	732	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	464	715	-	-	1203	-
Mov Cap-2 Maneuver	464	-	-	-	-	-
Stage 1	732	-	-	-	-	-
Stage 2	774	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	15.02	0	0.74
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	537	166	-
HCM Lane V/C Ratio	-	-	0.334	0.018	-
HCM Ctrl Dly (s/v)	-	-	15	8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.5	0.1	-

Intersection	
Int Delay, s/veh	9.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	287	2	46	540	77	4	76	35	35	50	17
Future Vol, veh/h	15	287	2	46	540	77	4	76	35	35	50	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	2	0	0	1	0	0	0	0	5	0	0
Mvmt Flow	16	312	2	50	587	84	4	83	38	38	54	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	671	0	0	314	0	0	1060	1116	313	1115	1076	629
Stage 1	-	-	-	-	-	-	346	346	-	729	729	-
Stage 2	-	-	-	-	-	-	714	771	-	386	347	-
Critical Hdwy	4.23	-	-	4.1	-	-	7.1	6.5	6.2	7.15	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.5	-
Follow-up Hdwy	2.317	-	-	2.2	-	-	3.5	4	3.3	3.545	4	3.3
Pot Cap-1 Maneuver	870	-	-	1258	-	-	204	209	732	183	221	486
Stage 1	-	-	-	-	-	-	674	639	-	410	431	-
Stage 2	-	-	-	-	-	-	425	413	-	631	638	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	870	-	-	1258	-	-	134	191	732	94	202	486
Mov Cap-2 Maneuver	-	-	-	-	-	-	134	191	-	94	202	-
Stage 1	-	-	-	-	-	-	659	625	-	383	403	-
Stage 2	-	-	-	-	-	-	331	386	-	508	624	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.45	0.55	34.7	71.38
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	242	89	-	-	122	-	-	155
HCM Lane V/C Ratio	0.516	0.019	-	-	0.04	-	-	0.713
HCM Ctrl Dly (s/v)	34.7	9.2	0	-	8	0	-	71.4
HCM Lane LOS	D	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	2.7	0.1	-	-	0.1	-	-	4.2

Intersection	
Int Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	28	87	4	28	195	50	7	85	29	18	46	37
Future Vol, veh/h	28	87	4	28	195	50	7	85	29	18	46	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	0	0	4	0	4	19	0	0	5
Mvmt Flow	30	95	4	30	212	54	8	92	32	20	50	40

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	323	248	70	260	253	108	90	0	0	124	0	0
Stage 1	109	109	-	123	123	-	-	-	-	-	-	-
Stage 2	214	139	-	136	129	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.54	6.2	7.1	6.5	6.24	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.54	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.54	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.036	3.3	3.5	4	3.336	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	634	651	998	697	654	940	1518	-	-	1475	-	-
Stage 1	901	801	-	886	798	-	-	-	-	-	-	-
Stage 2	793	778	-	872	793	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	395	638	998	582	641	940	1518	-	-	1475	-	-
Mov Cap-2 Maneuver	395	638	-	582	641	-	-	-	-	-	-	-
Stage 1	888	790	-	881	793	-	-	-	-	-	-	-
Stage 2	545	773	-	753	782	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	13.29	14.49	0.43	1.33
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	99	-	-	563	674	295	-	-
HCM Lane V/C Ratio	0.005	-	-	0.23	0.441	0.013	-	-
HCM Ctrl Dly (s/v)	7.4	0	-	13.3	14.5	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.9	2.3	0	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	206	2	70	341	31	0	31	74	18	29	31
Future Vol, veh/h	7	206	2	70	341	31	0	31	74	18	29	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	6	0	3	1	0	0	0	5	0	0	0
Mvmt Flow	8	224	2	76	371	34	0	34	80	20	32	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	404	0	0	226	0	0	779	797	225	796	781	387
Stage 1	-	-	-	-	-	-	240	240	-	540	540	-
Stage 2	-	-	-	-	-	-	539	557	-	256	241	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.25	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.345	3.5	4	3.3
Pot Cap-1 Maneuver	1165	-	-	1336	-	-	316	322	807	308	329	665
Stage 1	-	-	-	-	-	-	768	710	-	530	525	-
Stage 2	-	-	-	-	-	-	530	516	-	753	710	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1165	-	-	1336	-	-	249	296	807	228	302	665
Mov Cap-2 Maneuver	-	-	-	-	-	-	249	296	-	228	302	-
Stage 1	-	-	-	-	-	-	762	705	-	491	486	-
Stage 2	-	-	-	-	-	-	436	478	-	641	704	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.26	1.24	13.56	18.45
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	534	58	-	-	280	-	-	352
HCM Lane V/C Ratio	0.214	0.007	-	-	0.057	-	-	0.241
HCM Ctrl Dly (s/v)	13.6	8.1	0	-	7.9	0	-	18.4
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0.2	-	-	0.9

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	101	269	350	215	87	76
Future Vol, veh/h	101	269	350	215	87	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	110	292	380	234	95	83

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	614	0	-	0	1009	497
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	512	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	975	-	-	-	268	577
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	606	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	975	-	-	-	232	577
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	606	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	2.5	0	29.04
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	491	-	-	-	322
HCM Lane V/C Ratio	0.113	-	-	-	0.55
HCM Ctrl Dly (s/v)	9.2	0	-	-	29
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	-	3.1

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	33	70	20	24	17
Future Vol, veh/h	22	33	70	20	24	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	24	36	76	22	26	18

Major/Minor	Major1		Minor2	
Conflicting Flow All	0	0	76	98
Stage 1	-	-	0	0
Stage 2	-	-	76	98
Critical Hdwy	-	-	6.4	6.5
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.4	5.5
Follow-up Hdwy	-	-	3.5	4
Pot Cap-1 Maneuver	-	-	932	796
Stage 1	-	-	-	-
Stage 2	-	-	952	818
Platoon blocked, %	-	-		
Mov Cap-1 Maneuver	-	-	932	0
Mov Cap-2 Maneuver	-	-	932	0
Stage 1	-	-	-	0
Stage 2	-	-	952	0

Approach	NB	SB
HCM Ctrl Dly, s/v	0	9.06
HCM LOS		A

Minor Lane/Major Mvmt	NBT	NBR	SBLn1
Capacity (veh/h)	-	-	932
HCM Lane V/C Ratio	-	-	0.048
HCM Ctrl Dly (s/v)	-	-	9.1
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.2

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	598	29	87	1120	26	35
Future Vol, veh/h	598	29	87	1120	26	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	0	0	5
Mvmt Flow	650	32	95	1217	28	38

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	682	0	2072	666
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	1407	-
Critical Hdwy	-	-	4.1	-	6.4	6.25
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.345
Pot Cap-1 Maneuver	-	-	921	-	60	454
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	229	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	921	-	54	454
Mov Cap-2 Maneuver	-	-	-	-	153	-
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	205	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.67	24.81
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	247	-	-	921	-
HCM Lane V/C Ratio	0.268	-	-	0.103	-
HCM Ctrl Dly (s/v)	24.8	-	-	9.4	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.1	-	-	0.3	-

Intersection	
Int Delay, s/veh	378.9

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	109	683	238	88	269	383
Future Vol, veh/h	109	683	238	88	269	383
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	83	83	100	100
Heavy Vehicles, %	2	2	5	0	0	1
Mvmt Flow	156	976	287	106	269	383

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1261	340	0	0	393	0
Stage 1	340	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.2	-
Pot Cap-1 Maneuver	188	~ 703	-	-	1177	-
Stage 1	721	-	-	-	-	-
Stage 2	388	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 133	~ 703	-	-	1177	-
Mov Cap-2 Maneuver	~ 133	-	-	-	-	-
Stage 1	721	-	-	-	-	-
Stage 2	275	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	$ 726.64	0	3.7
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	443	743	-
HCM Lane V/C Ratio	-	-	2.556	0.229	-
HCM Ctrl Dly (s/v)	-	-	$ 726.6	9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	90.8	0.9	-

Notes	
~: Volume exceeds capacity	$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon

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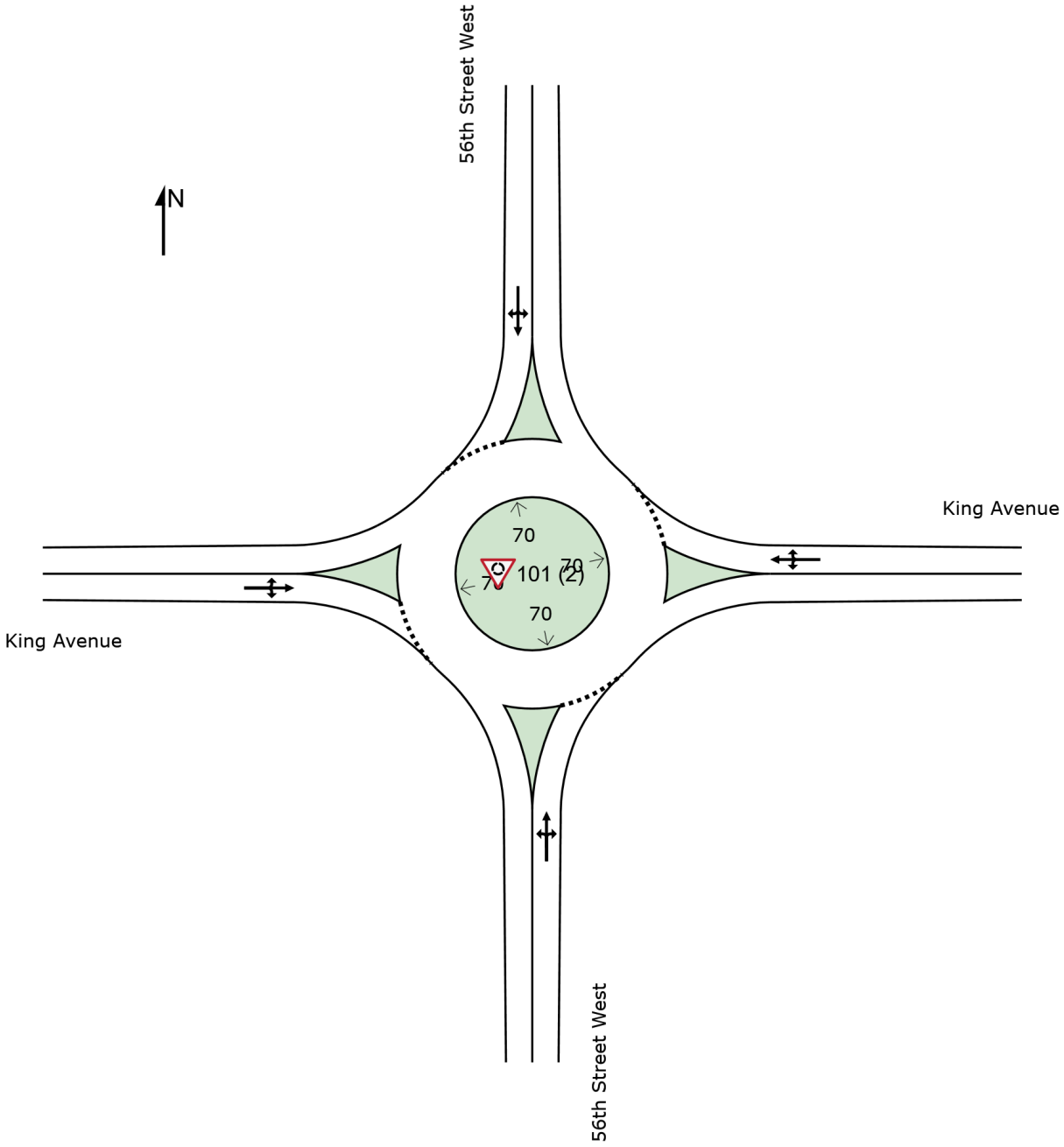
SITE LAYOUT

Site: [101 (2)] King Ave & 56th St AM (Future (2044))

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (2)] King Ave & 56th St AM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV %]	Arrival Flows [Total veh/h	HV %]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	133	3.0	133	3.0	0.572	12.6	LOS B	5.0	125.7	0.75	0.68	1.08	34.0
4	T1	All MCs	260	0.8	260	0.8	0.572	12.2	LOS B	5.0	125.7	0.75	0.68	1.08	33.4
14	R2	All MCs	100	0.0	100	0.0	0.572	12.1	LOS B	5.0	125.7	0.75	0.68	1.08	34.4
Approach			492	1.2	492	1.2	0.572	12.3	LOS B	5.0	125.7	0.75	0.68	1.08	33.8
West: King Avenue															
5	L2	All MCs	126	6.3	126	6.3	0.894	31.9	LOS D	20.9	533.2	1.00	1.28	2.53	26.2
2	T1	All MCs	599	1.3	599	1.3	0.894	31.0	LOS D	20.9	533.2	1.00	1.28	2.53	27.7
12	R2	All MCs	40	10.0	40	10.0	0.894	32.5	LOS D	20.9	533.2	1.00	1.28	2.53	26.2
Approach			765	2.6	765	2.6	0.894	31.2	LOS D	20.9	533.2	1.00	1.28	2.53	27.4
South: 56th Street West															
3	L2	All MCs	36	0.0	36	0.0	0.450	13.5	LOS B	2.2	56.4	0.76	0.79	0.99	33.5
8	T1	All MCs	154	3.9	154	3.9	0.450	14.6	LOS B	2.2	56.4	0.76	0.79	0.99	32.3
18	R2	All MCs	48	4.2	48	4.2	0.450	14.7	LOS B	2.2	56.4	0.76	0.79	0.99	33.1
Approach			238	3.4	238	3.4	0.450	14.4	LOS B	2.2	56.4	0.76	0.79	0.99	32.6
East: King Avenue															
1	L2	All MCs	34	5.9	34	5.9	0.458	9.4	LOS A	2.7	70.5	0.61	0.44	0.65	35.4
6	T1	All MCs	364	2.7	364	2.7	0.458	9.1	LOS A	2.7	70.5	0.61	0.44	0.65	38.0
16	R2	All MCs	30	20.0	30	20.0	0.458	11.3	LOS B	2.7	70.5	0.61	0.44	0.65	33.9
Approach			428	4.2	428	4.2	0.458	9.2	LOS A	2.7	70.5	0.61	0.44	0.65	37.4
All Vehicles			1924	2.7	1924	2.7	0.894	19.4	LOS C	20.9	533.2	0.82	0.88	1.55	31.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [102 (2)] King Ave & 56th St PM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	76	0.0	76	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.5
4	T1	All MCs	128	0.0	128	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	34.6
14	R2	All MCs	134	0.0	134	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.7
Approach			338	0.0	338	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.2
West: King Avenue															
5	L2	All MCs	80	0.0	80	0.0	0.460	8.3	LOS A	2.9	72.5	0.55	0.34	0.55	36.6
2	T1	All MCs	395	1.5	395	1.5	0.460	8.4	LOS A	2.9	72.5	0.55	0.34	0.55	38.4
12	R2	All MCs	14	14.3	14	14.3	0.460	9.8	LOS A	2.9	72.5	0.55	0.34	0.55	34.9
Approach			489	1.6	489	1.6	0.460	8.4	LOS A	2.9	72.5	0.55	0.34	0.55	38.0
South: 56th Street West															
3	L2	All MCs	50	0.0	50	0.0	0.467	10.8	LOS B	3.0	74.7	0.71	0.65	0.92	36.5
8	T1	All MCs	272	0.0	272	0.0	0.467	10.8	LOS B	3.0	74.7	0.71	0.65	0.92	35.5
18	R2	All MCs	40	5.0	40	5.0	0.467	11.7	LOS B	3.0	74.7	0.71	0.65	0.92	35.9
Approach			362	0.6	362	0.6	0.467	10.9	LOS B	3.0	74.7	0.71	0.65	0.92	35.7
East: King Avenue															
1	L2	All MCs	34	0.0	34	0.0	0.708	16.1	LOS C	9.5	239.3	0.86	0.81	1.46	32.7
6	T1	All MCs	485	1.2	485	1.2	0.708	16.2	LOS C	9.5	239.3	0.86	0.81	1.46	34.2
16	R2	All MCs	122	0.0	122	0.0	0.708	16.1	LOS C	9.5	239.3	0.86	0.81	1.46	33.1
Approach			640	0.9	640	0.9	0.708	16.2	LOS C	9.5	239.3	0.86	0.81	1.46	33.9
All Vehicles			1829	0.9	1829	0.9	0.708	12.0	LOS B	9.5	239.3	0.72	0.62	1.00	35.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [102 (2)] King Ave & 56th St PM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	76	0.0	76	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.5
4	T1	All MCs	128	0.0	128	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	34.6
14	R2	All MCs	134	0.0	134	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.7
Approach			338	0.0	338	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.2
West: King Avenue															
5	L2	All MCs	80	0.0	80	0.0	0.460	8.3	LOS A	2.9	72.5	0.55	0.34	0.55	36.6
2	T1	All MCs	395	1.5	395	1.5	0.460	8.4	LOS A	2.9	72.5	0.55	0.34	0.55	38.4
12	R2	All MCs	14	14.3	14	14.3	0.460	9.8	LOS A	2.9	72.5	0.55	0.34	0.55	34.9
Approach			489	1.6	489	1.6	0.460	8.4	LOS A	2.9	72.5	0.55	0.34	0.55	38.0
South: 56th Street West															
3	L2	All MCs	50	0.0	50	0.0	0.467	10.8	LOS B	3.0	74.7	0.71	0.65	0.92	36.5
8	T1	All MCs	272	0.0	272	0.0	0.467	10.8	LOS B	3.0	74.7	0.71	0.65	0.92	35.5
18	R2	All MCs	40	5.0	40	5.0	0.467	11.7	LOS B	3.0	74.7	0.71	0.65	0.92	35.9
Approach			362	0.6	362	0.6	0.467	10.9	LOS B	3.0	74.7	0.71	0.65	0.92	35.7
East: King Avenue															
1	L2	All MCs	34	0.0	34	0.0	0.708	16.1	LOS C	9.5	239.3	0.86	0.81	1.46	32.7
6	T1	All MCs	485	1.2	485	1.2	0.708	16.2	LOS C	9.5	239.3	0.86	0.81	1.46	34.2
16	R2	All MCs	122	0.0	122	0.0	0.708	16.1	LOS C	9.5	239.3	0.86	0.81	1.46	33.1
Approach			640	0.9	640	0.9	0.708	16.2	LOS C	9.5	239.3	0.86	0.81	1.46	33.9
All Vehicles			1829	0.9	1829	0.9	0.708	12.0	LOS B	9.5	239.3	0.72	0.62	1.00	35.5

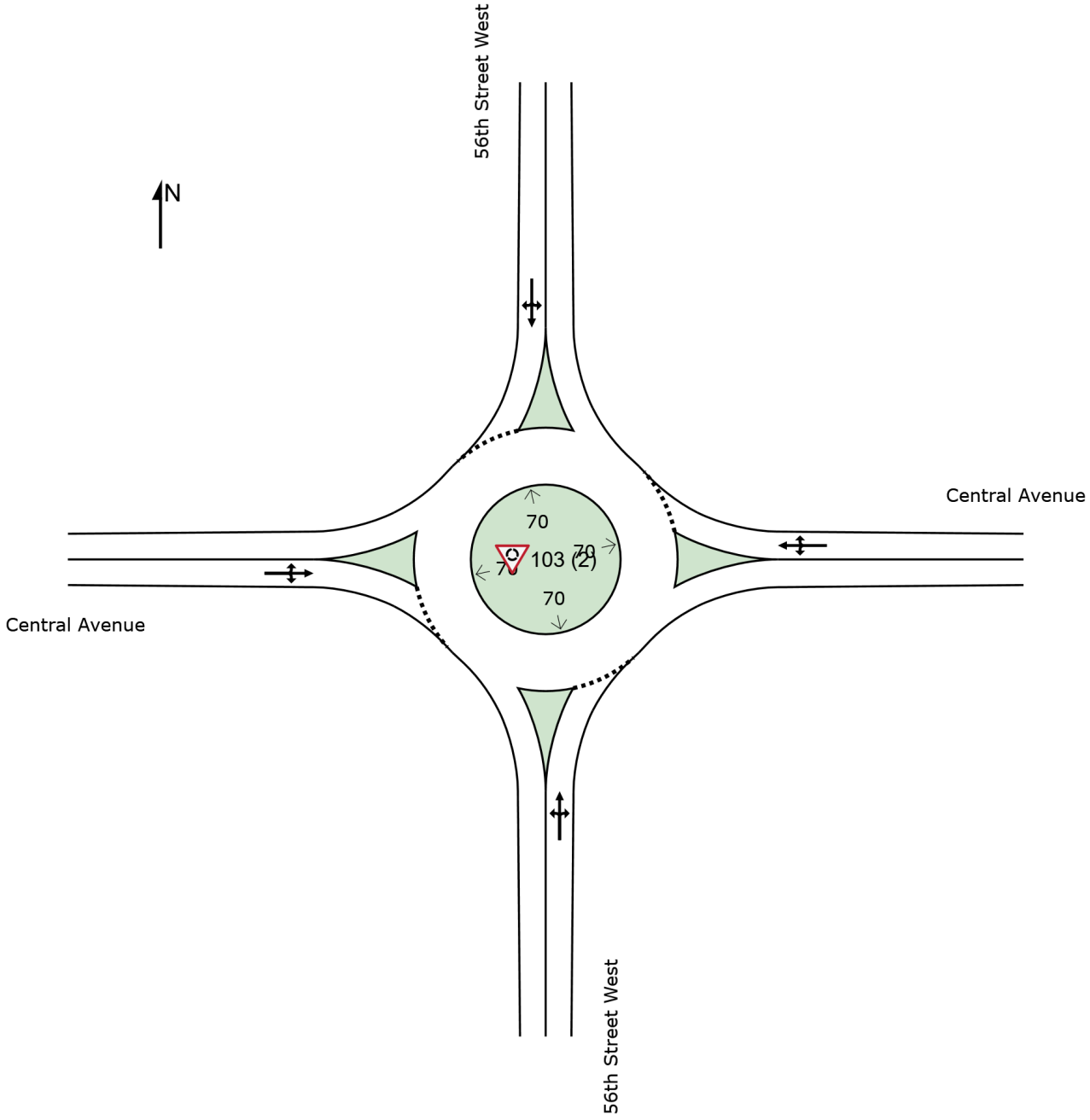
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: [103 (2)] Central Ave & 56th St AM (Future (2044))

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [103 (2)] Central Ave & 56th St AM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV %]	Arrival Flows [Total veh/h	HV %]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	186	2.2	186	2.2	0.465	8.3	LOS A	3.0	75.6	0.52	0.30	0.52	34.4
4	T1	All MCs	324	1.9	324	1.9	0.465	8.3	LOS A	3.0	75.6	0.52	0.30	0.52	35.1
14	R2	All MCs	1	0.0	1	0.0	0.465	8.1	LOS A	3.0	75.6	0.52	0.30	0.52	35.1
Approach			511	2.0	511	2.0	0.465	8.3	LOS A	3.0	75.6	0.52	0.30	0.52	34.9
West: Central Avenue															
5	L2	All MCs	2	0.0	2	0.0	0.226	7.4	LOS A	1.0	24.5	0.62	0.53	0.62	36.1
2	T1	All MCs	136	0.0	136	0.0	0.226	7.4	LOS A	1.0	24.5	0.62	0.53	0.62	36.8
12	R2	All MCs	28	0.0	28	0.0	0.226	7.4	LOS A	1.0	24.5	0.62	0.53	0.62	36.5
Approach			166	0.0	166	0.0	0.226	7.4	LOS A	1.0	24.5	0.62	0.53	0.62	36.7
South: 56th Street West															
3	L2	All MCs	8	75.0	8	75.0	0.318	17.7	LOS C	1.6	40.3	0.53	0.37	0.53	27.1
8	T1	All MCs	133	6.1	133	6.1	0.318	7.3	LOS A	1.6	40.3	0.53	0.37	0.53	36.1
18	R2	All MCs	157	0.0	157	0.0	0.318	6.7	LOS A	1.6	40.3	0.53	0.37	0.53	36.7
Approach			297	4.6	297	4.6	0.318	7.2	LOS A	1.6	40.3	0.53	0.37	0.53	36.1
East: Central Avenue															
1	L2	All MCs	96	2.1	96	2.1	0.272	5.5	LOS A	1.4	35.8	0.37	0.19	0.37	35.9
6	T1	All MCs	86	4.7	86	4.7	0.272	5.7	LOS A	1.4	35.8	0.37	0.19	0.37	36.3
16	R2	All MCs	120	10.0	120	10.0	0.272	6.1	LOS A	1.4	35.8	0.37	0.19	0.37	35.2
Approach			301	6.0	301	6.0	0.272	5.8	LOS A	1.4	35.8	0.37	0.19	0.37	35.7
All Vehicles			1275	3.3	1275	3.3	0.465	7.3	LOS A	3.0	75.6	0.50	0.32	0.50	35.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [104 (2)] Central Ave & 56th St PM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	46	0.0	46	0.0	0.281	6.1	LOS A	1.4	35.9	0.48	0.31	0.48	36.4
4	T1	All MCs	228	0.9	228	0.9	0.281	6.2	LOS A	1.4	35.9	0.48	0.31	0.48	37.0
14	R2	All MCs	18	0.0	18	0.0	0.281	6.1	LOS A	1.4	35.9	0.48	0.31	0.48	36.8
Approach			292	0.7	292	0.7	0.281	6.2	LOS A	1.4	35.9	0.48	0.31	0.48	36.9
West: Central Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.106	4.8	LOS A	0.5	11.3	0.48	0.35	0.48	37.6
2	T1	All MCs	88	0.0	88	0.0	0.106	4.8	LOS A	0.5	11.3	0.48	0.35	0.48	38.4
12	R2	All MCs	10	0.0	10	0.0	0.106	4.8	LOS A	0.5	11.3	0.48	0.35	0.48	38.0
Approach			99	0.0	99	0.0	0.106	4.8	LOS A	0.5	11.3	0.48	0.35	0.48	38.3
South: 56th Street West															
3	L2	All MCs	18	0.0	18	0.0	0.348	6.2	LOS A	2.1	51.4	0.37	0.18	0.37	36.7
8	T1	All MCs	312	0.0	312	0.0	0.348	6.2	LOS A	2.1	51.4	0.37	0.18	0.37	37.4
18	R2	All MCs	88	0.0	88	0.0	0.348	6.2	LOS A	2.1	51.4	0.37	0.18	0.37	37.1
Approach			418	0.0	418	0.0	0.348	6.2	LOS A	2.1	51.4	0.37	0.18	0.37	37.3
East: Central Avenue															
1	L2	All MCs	107	0.0	107	0.0	0.373	7.6	LOS A	2.0	50.7	0.56	0.39	0.56	35.3
6	T1	All MCs	145	0.0	145	0.0	0.373	7.6	LOS A	2.0	50.7	0.56	0.39	0.56	36.0
16	R2	All MCs	116	0.0	116	0.0	0.373	7.6	LOS A	2.0	50.7	0.56	0.39	0.56	35.7
Approach			367	0.0	367	0.0	0.373	7.6	LOS A	2.0	50.7	0.56	0.39	0.56	35.7
All Vehicles			1177	0.2	1177	0.2	0.373	6.5	LOS A	2.1	51.4	0.47	0.29	0.47	36.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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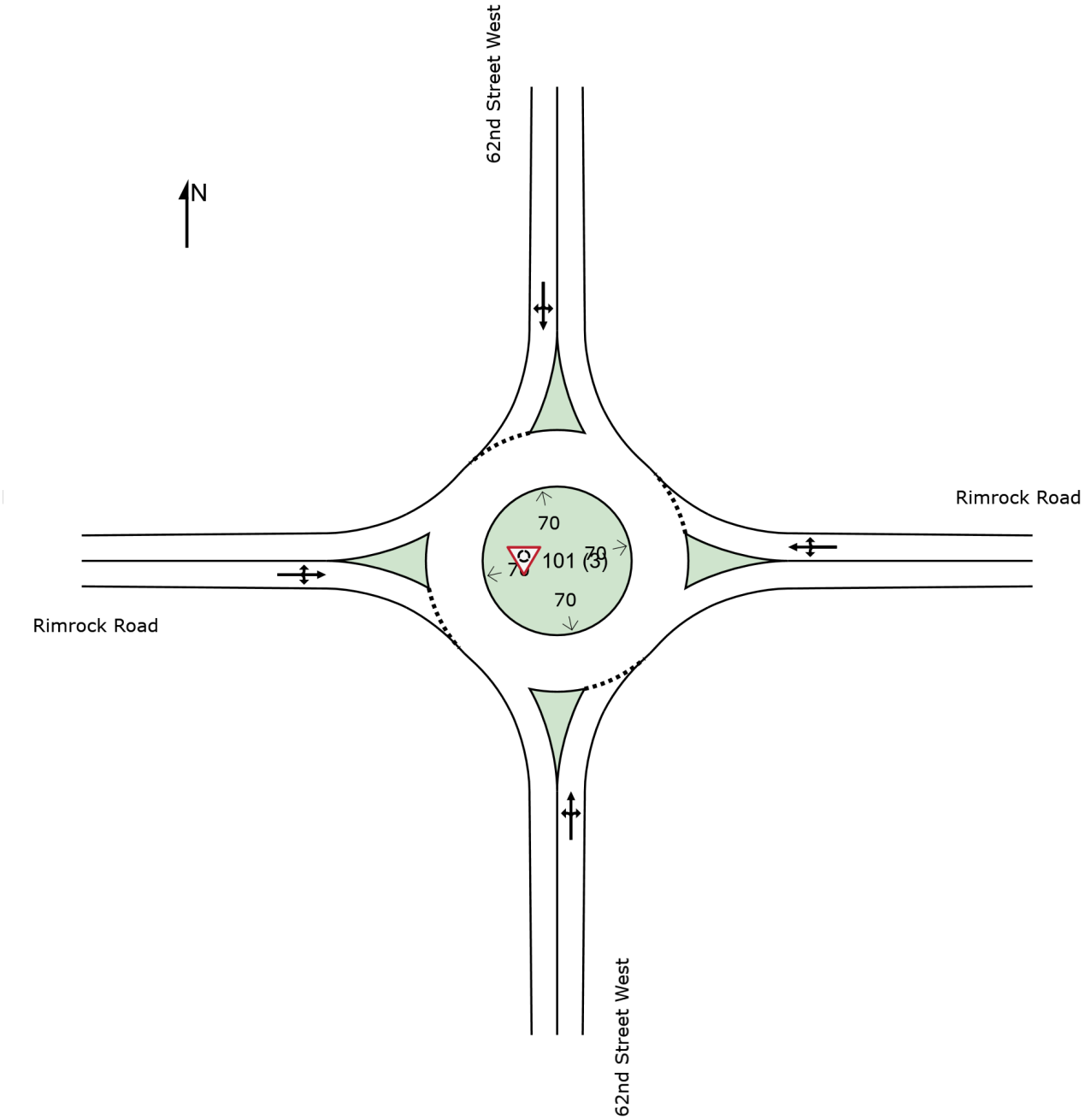
SITE LAYOUT

Site: [101 (3)] Rimrock Rd & 62nd St AM (Future (2044))

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (3)] Rimrock Rd & 62nd St AM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 62nd Street West															
7	L2	All MCs	664	0.0	664	0.0	0.748	14.7	LOS B	13.3	332.1	0.79	0.53	1.03	30.7
4	T1	All MCs	196	1.0	196	1.0	0.748	14.8	LOS B	13.3	332.1	0.79	0.53	1.03	29.7
14	R2	All MCs	4	0.0	4	0.0	0.748	14.7	LOS B	13.3	332.1	0.79	0.53	1.03	30.9
Approach			864	0.2	864	0.2	0.748	14.7	LOS B	13.3	332.1	0.79	0.53	1.03	30.5
West: Rimrock Road															
5	L2	All MCs	4	0.0	4	0.0	0.872	40.2	LOS E	9.1	231.8	0.95	1.24	2.28	23.3
2	T1	All MCs	272	3.0	272	3.0	0.872	41.2	LOS E	9.1	231.8	0.95	1.24	2.28	24.3
12	R2	All MCs	178	1.0	178	1.0	0.872	40.5	LOS E	9.1	231.8	0.95	1.24	2.28	23.4
Approach			454	2.2	454	2.2	0.872	41.0	LOS E	9.1	231.8	0.95	1.24	2.28	23.9
South: 62nd Street West															
3	L2	All MCs	34	12.0	34	12.0	0.303	13.9	LOS B	1.1	29.0	0.71	0.73	0.82	30.9
8	T1	All MCs	48	17.0	48	17.0	0.303	15.5	LOS C	1.1	29.0	0.71	0.73	0.82	29.5
18	R2	All MCs	48	4.0	48	4.0	0.303	11.5	LOS B	1.1	29.0	0.71	0.73	0.82	32.0
Approach			129	10.9	129	10.9	0.303	13.5	LOS B	1.1	29.0	0.71	0.73	0.82	30.7
East: Rimrock Road															
1	L2	All MCs	48	4.0	48	4.0	0.231	4.9	LOS A	1.1	29.9	0.27	0.12	0.27	36.2
6	T1	All MCs	72	17.0	72	17.0	0.231	5.9	LOS A	1.1	29.9	0.27	0.12	0.27	37.3
16	R2	All MCs	154	0.0	154	0.0	0.231	4.7	LOS A	1.1	29.9	0.27	0.12	0.27	37.3
Approach			274	5.2	274	5.2	0.231	5.0	LOS A	1.1	29.9	0.27	0.12	0.27	37.1
All Vehicles			1722	2.3	1722	2.3	0.872	20.0	LOS C	13.3	332.1	0.75	0.67	1.22	29.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (4)] Rimrock Rd & 62nd St PM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 62nd Street West															
7	L2	All MCs	283	0.0	283	0.0	0.441	9.2	LOS A	2.7	67.3	0.65	0.51	0.71	33.4
4	T1	All MCs	107	0.0	107	0.0	0.441	9.2	LOS A	2.7	67.3	0.65	0.51	0.71	32.3
14	R2	All MCs	12	0.0	12	0.0	0.441	9.2	LOS A	2.7	67.3	0.65	0.51	0.71	33.6
Approach			401	0.0	401	0.0	0.441	9.2	LOS A	2.7	67.3	0.65	0.51	0.71	33.1
West: Rimrock Road															
5	L2	All MCs	4	0.0	4	0.0	0.237	6.5	LOS A	1.1	27.1	0.56	0.43	0.56	36.2
2	T1	All MCs	130	2.0	130	2.0	0.237	6.7	LOS A	1.1	27.1	0.56	0.43	0.56	38.8
12	R2	All MCs	68	0.0	68	0.0	0.237	6.5	LOS A	1.1	27.1	0.56	0.43	0.56	36.7
Approach			203	1.3	203	1.3	0.237	6.7	LOS A	1.1	27.1	0.56	0.43	0.56	38.0
South: 62nd Street West															
3	L2	All MCs	162	0.0	162	0.0	0.375	8.2	LOS A	2.0	48.8	0.61	0.46	0.61	34.4
8	T1	All MCs	145	0.0	145	0.0	0.375	8.2	LOS A	2.0	48.8	0.61	0.46	0.61	33.2
18	R2	All MCs	30	0.0	30	0.0	0.375	8.2	LOS A	2.0	48.8	0.61	0.46	0.61	34.6
Approach			337	0.0	337	0.0	0.375	8.2	LOS A	2.0	48.8	0.61	0.46	0.61	33.9
East: Rimrock Road															
1	L2	All MCs	60	0.0	60	0.0	0.786	18.6	LOS C	15.9	397.2	0.94	0.90	1.70	30.3
6	T1	All MCs	188	0.0	188	0.0	0.786	18.6	LOS C	15.9	397.2	0.94	0.90	1.70	32.3
16	R2	All MCs	542	0.0	542	0.0	0.786	18.6	LOS C	15.9	397.2	0.94	0.90	1.70	30.6
Approach			790	0.0	790	0.0	0.786	18.6	LOS C	15.9	397.2	0.94	0.90	1.70	31.0
All Vehicles			1732	0.2	1732	0.2	0.786	13.0	LOS B	15.9	397.2	0.76	0.67	1.13	32.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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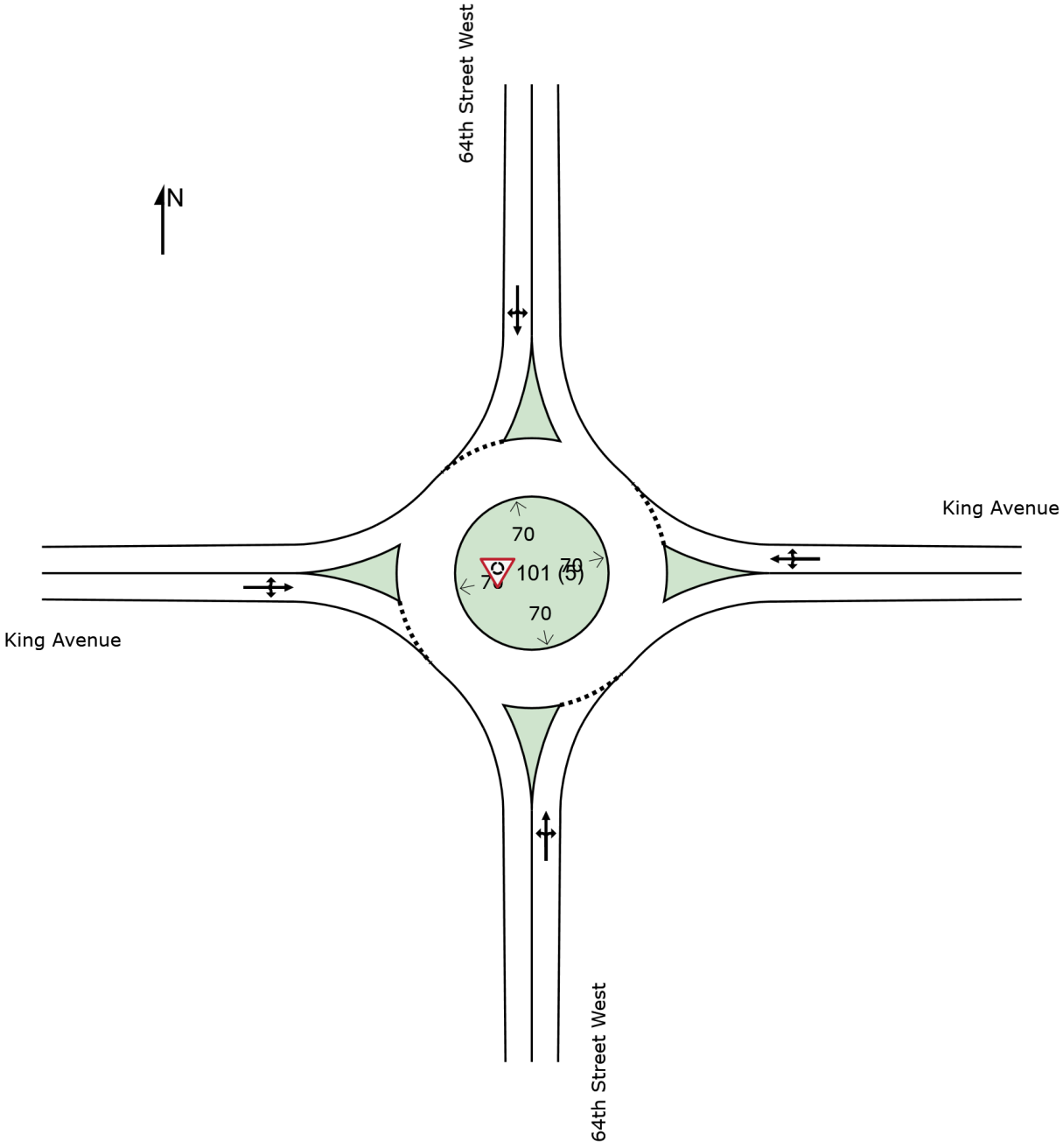
SITE LAYOUT

Site: [101 (5)] King Ave & 64th St AM (Future (2044))

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (5)] King Ave & 64th St AM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 64th Street West															
7	L2	All MCs	14	14.3	14	14.3	0.236	8.5	LOS A	1.1	26.9	0.56	0.43	0.56	36.1
4	T1	All MCs	48	0.0	48	0.0	0.236	6.5	LOS A	1.1	26.9	0.56	0.43	0.56	37.2
14	R2	All MCs	140	0.0	140	0.0	0.236	6.5	LOS A	1.1	26.9	0.56	0.43	0.56	38.4
Approach			202	1.0	202	1.0	0.236	6.6	LOS A	1.1	26.9	0.56	0.43	0.56	37.9
West: King Avenue															
5	L2	All MCs	152	6.6	152	6.6	0.761	16.1	LOS C	15.0	387.5	0.83	0.60	1.17	31.8
2	T1	All MCs	575	3.5	575	3.5	0.761	15.8	LOS C	15.0	387.5	0.83	0.60	1.17	33.9
12	R2	All MCs	108	7.4	108	7.4	0.761	16.2	LOS C	15.0	387.5	0.83	0.60	1.17	32.1
Approach			835	4.6	835	4.6	0.761	15.9	LOS C	15.0	387.5	0.83	0.60	1.17	33.2
South: 64th Street West															
3	L2	All MCs	16	0.0	16	0.0	0.484	13.2	LOS B	2.7	68.6	0.76	0.77	1.03	34.1
8	T1	All MCs	102	3.9	102	3.9	0.484	14.2	LOS B	2.7	68.6	0.76	0.77	1.03	32.8
18	R2	All MCs	174	1.1	174	1.1	0.484	13.5	LOS B	2.7	68.6	0.76	0.77	1.03	34.1
Approach			292	2.0	292	2.0	0.484	13.7	LOS B	2.7	68.6	0.76	0.77	1.03	33.6
East: King Avenue															
1	L2	All MCs	110	3.6	110	3.6	0.477	9.2	LOS A	2.9	73.9	0.60	0.39	0.60	35.5
6	T1	All MCs	316	1.9	316	1.9	0.477	9.0	LOS A	2.9	73.9	0.60	0.39	0.60	37.8
16	R2	All MCs	54	0.0	54	0.0	0.477	8.8	LOS A	2.9	73.9	0.60	0.39	0.60	36.5
Approach			480	2.1	480	2.1	0.477	9.1	LOS A	2.9	73.9	0.60	0.39	0.60	37.1
All Vehicles			1810	3.1	1810	3.1	0.761	12.7	LOS B	15.0	387.5	0.72	0.55	0.93	34.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (6)] King Ave & 64th St PM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 64th Street West															
7	L2	All MCs	28	0.0	28	0.0	0.399	10.0	LOS A	2.2	54.0	0.69	0.62	0.80	36.2
4	T1	All MCs	76	0.0	76	0.0	0.399	10.0	LOS A	2.2	54.0	0.69	0.62	0.80	35.2
14	R2	All MCs	192	0.0	192	0.0	0.399	10.0	LOS A	2.2	54.0	0.69	0.62	0.80	36.4
Approach			297	0.0	297	0.0	0.399	10.0	LOS A	2.2	54.0	0.69	0.62	0.80	36.0
West: King Avenue															
5	L2	All MCs	154	0.0	154	0.0	0.497	8.3	LOS A	3.5	88.0	0.49	0.26	0.49	36.3
2	T1	All MCs	409	2.0	409	2.0	0.497	8.5	LOS A	3.5	88.0	0.49	0.26	0.49	38.0
12	R2	All MCs	12	0.0	12	0.0	0.497	8.3	LOS A	3.5	88.0	0.49	0.26	0.49	36.7
Approach			575	1.4	575	1.4	0.497	8.5	LOS A	3.5	88.0	0.49	0.26	0.49	37.5
South: 64th Street West															
3	L2	All MCs	4	0.0	4	0.0	0.213	7.1	LOS A	0.9	22.8	0.61	0.52	0.61	37.9
8	T1	All MCs	95	0.0	95	0.0	0.213	7.1	LOS A	0.9	22.8	0.61	0.52	0.61	36.8
18	R2	All MCs	58	3.4	58	3.4	0.213	7.6	LOS A	0.9	22.8	0.61	0.52	0.61	37.5
Approach			157	1.3	157	1.3	0.213	7.3	LOS A	0.9	22.8	0.61	0.52	0.61	37.1
East: King Avenue															
1	L2	All MCs	54	0.0	54	0.0	0.613	11.4	LOS B	6.6	165.2	0.69	0.50	0.87	35.0
6	T1	All MCs	542	1.1	542	1.1	0.613	11.5	LOS B	6.6	165.2	0.69	0.50	0.87	36.8
16	R2	All MCs	50	0.0	50	0.0	0.613	11.4	LOS B	6.6	165.2	0.69	0.50	0.87	35.4
Approach			647	0.9	647	0.9	0.613	11.5	LOS B	6.6	165.2	0.69	0.50	0.87	36.5
All Vehicles			1675	1.0	1675	1.0	0.613	9.8	LOS A	6.6	165.2	0.61	0.44	0.70	36.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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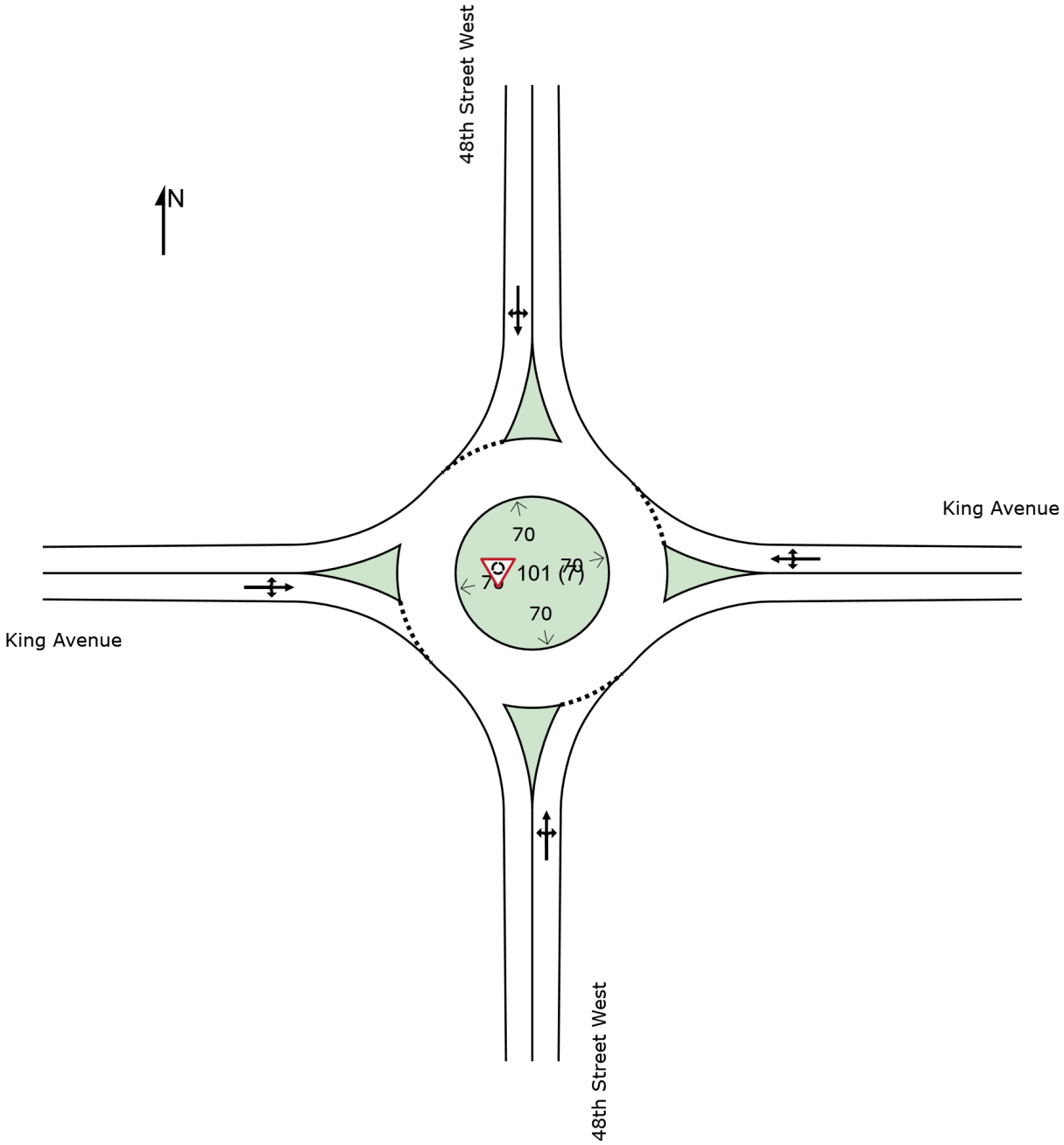
SITE LAYOUT

Site: [101 (7)] King Ave & 48th St AM (Future (2044))

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (7)] King Ave & 48th St AM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	98	0.0	98	0.0	0.295	7.5	LOS A	1.4	34.8	0.60	0.48	0.60	36.7
4	T1	All MCs	116	1.7	116	1.7	0.295	7.7	LOS A	1.4	34.8	0.60	0.48	0.60	35.4
14	R2	All MCs	30	0.0	30	0.0	0.295	7.5	LOS A	1.4	34.8	0.60	0.48	0.60	36.7
Approach			245	0.8	245	0.8	0.295	7.6	LOS A	1.4	34.8	0.60	0.48	0.60	36.1
West: King Avenue															
5	L2	All MCs	78	2.6	78	2.6	0.705	14.2	LOS B	10.7	287.8	0.78	0.63	1.19	32.8
2	T1	All MCs	609	10.5	609	10.5	0.705	15.1	LOS C	10.7	287.8	0.78	0.63	1.19	33.7
12	R2	All MCs	2	0.0	2	0.0	0.705	14.0	LOS B	10.7	287.8	0.78	0.63	1.19	33.5
Approach			689	9.6	689	9.6	0.705	15.0	LOS C	10.7	287.8	0.78	0.63	1.19	33.6
South: 48th Street West															
3	L2	All MCs	7	33.0	7	33.0	0.238	19.2	LOS C	0.9	23.1	0.68	0.64	0.68	31.9
8	T1	All MCs	86	4.7	86	4.7	0.238	10.0	LOS B	0.9	23.1	0.68	0.64	0.68	34.6
18	R2	All MCs	34	0.0	34	0.0	0.238	8.8	LOS A	0.9	23.1	0.68	0.64	0.68	36.2
Approach			126	4.9	126	4.9	0.238	10.1	LOS B	0.9	23.1	0.68	0.64	0.68	34.9
East: King Avenue															
1	L2	All MCs	18	0.0	18	0.0	0.450	7.5	LOS A	2.6	71.5	0.48	0.27	0.48	36.9
6	T1	All MCs	416	10.6	416	10.6	0.450	8.4	LOS A	2.6	71.5	0.48	0.27	0.48	37.6
16	R2	All MCs	32	6.3	32	6.3	0.450	8.1	LOS A	2.6	71.5	0.48	0.27	0.48	36.4
Approach			466	9.9	466	9.9	0.450	8.4	LOS A	2.6	71.5	0.48	0.27	0.48	37.5
All Vehicles			1526	7.9	1526	7.9	0.705	11.4	LOS B	10.7	287.8	0.65	0.50	0.84	35.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (8)] King Ave & 48th St PM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	84	0.0	84	0.0	0.408	11.9	LOS B	2.0	50.4	0.73	0.73	0.90	34.1
4	T1	All MCs	120	3.3	120	3.3	0.408	12.8	LOS B	2.0	50.4	0.73	0.73	0.90	32.9
14	R2	All MCs	34	0.0	34	0.0	0.408	11.9	LOS B	2.0	50.4	0.73	0.73	0.90	34.2
Approach			237	1.7	237	1.7	0.408	12.4	LOS B	2.0	50.4	0.73	0.73	0.90	33.5
West: King Avenue															
5	L2	All MCs	60	0.0	60	0.0	0.632	12.0	LOS B	7.3	185.0	0.72	0.54	0.96	34.7
2	T1	All MCs	583	1.0	583	1.0	0.632	12.1	LOS B	7.3	185.0	0.72	0.54	0.96	36.4
12	R2	All MCs	16	0.0	16	0.0	0.632	12.0	LOS B	7.3	185.0	0.72	0.54	0.96	35.1
Approach			659	0.9	659	0.9	0.632	12.1	LOS B	7.3	185.0	0.72	0.54	0.96	36.2
South: 48th Street West															
3	L2	All MCs	7	0.0	7	0.0	0.253	8.6	LOS A	1.1	26.8	0.66	0.60	0.66	37.1
8	T1	All MCs	118	0.0	118	0.0	0.253	8.6	LOS A	1.1	26.8	0.66	0.60	0.66	36.0
18	R2	All MCs	40	0.0	40	0.0	0.253	8.6	LOS A	1.1	26.8	0.66	0.60	0.66	37.3
Approach			165	0.0	165	0.0	0.253	8.6	LOS A	1.1	26.8	0.66	0.60	0.66	36.4
East: King Avenue															
1	L2	All MCs	58	0.0	58	0.0	0.824	18.8	LOS C	22.5	564.8	0.97	0.76	1.53	31.5
6	T1	All MCs	751	0.3	751	0.3	0.824	18.8	LOS C	22.5	564.8	0.97	0.76	1.53	33.0
16	R2	All MCs	130	0.0	130	0.0	0.824	18.8	LOS C	22.5	564.8	0.97	0.76	1.53	31.8
Approach			939	0.2	939	0.2	0.824	18.8	LOS C	22.5	564.8	0.97	0.76	1.53	32.7
All Vehicles			2000	0.6	2000	0.6	0.824	15.0	LOS B	22.5	564.8	0.83	0.67	1.19	34.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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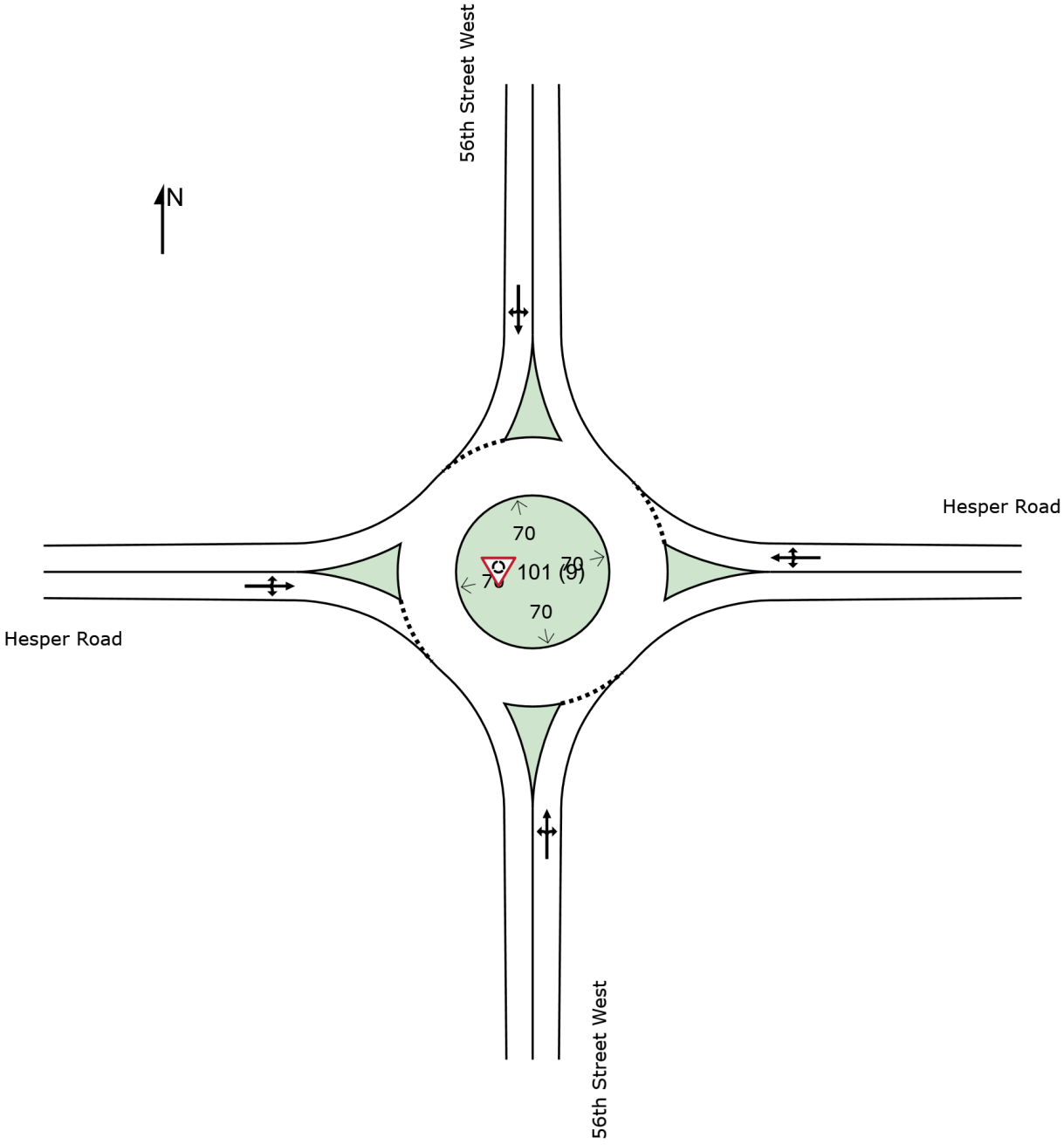
SITE LAYOUT

Site: [101 (9)] Hesper Rd & 56th St AM (Future (2044))

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (9)] Hesper Rd & 56th St AM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	150	0.0	150	0.0	0.323	6.3	LOS A	1.7	43.3	0.47	0.29	0.47	35.4
4	T1	All MCs	146	6.8	146	6.8	0.323	7.0	LOS A	1.7	43.3	0.47	0.29	0.47	35.2
14	R2	All MCs	42	0.0	42	0.0	0.323	6.3	LOS A	1.7	43.3	0.47	0.29	0.47	35.8
Approach			338	2.9	338	2.9	0.323	6.6	LOS A	1.7	43.3	0.47	0.29	0.47	35.4
West: Hesper Road															
5	L2	All MCs	58	0.0	58	0.0	0.407	8.0	LOS A	2.1	55.7	0.59	0.41	0.59	35.1
2	T1	All MCs	276	6.5	276	6.5	0.407	8.7	LOS A	2.1	55.7	0.59	0.41	0.59	34.9
12	R2	All MCs	40	0.0	40	0.0	0.407	8.0	LOS A	2.1	55.7	0.59	0.41	0.59	35.4
Approach			374	4.8	374	4.8	0.407	8.5	LOS A	2.1	55.7	0.59	0.41	0.59	35.0
South: 56th Street West															
3	L2	All MCs	58	3.4	58	3.4	0.302	8.0	LOS A	1.4	35.0	0.61	0.49	0.61	34.7
8	T1	All MCs	126	1.6	126	1.6	0.302	7.7	LOS A	1.4	35.0	0.61	0.49	0.61	35.6
18	R2	All MCs	54	7.4	54	7.4	0.302	8.6	LOS A	1.4	35.0	0.61	0.49	0.61	34.5
Approach			238	3.4	238	3.4	0.302	8.0	LOS A	1.4	35.0	0.61	0.49	0.61	35.1
East: Hesper Road															
1	L2	All MCs	32	12.5	32	12.5	0.218	6.1	LOS A	1.0	25.8	0.43	0.27	0.43	34.8
6	T1	All MCs	136	4.4	136	4.4	0.218	5.4	LOS A	1.0	25.8	0.43	0.27	0.43	36.8
16	R2	All MCs	46	17.4	46	17.4	0.218	6.6	LOS A	1.0	25.8	0.43	0.27	0.43	34.6
Approach			213	8.4	213	8.4	0.218	5.8	LOS A	1.0	25.8	0.43	0.27	0.43	36.0
All Vehicles			1163	4.6	1163	4.6	0.407	7.4	LOS A	2.1	55.7	0.53	0.37	0.53	35.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (10)] Hesper Rd & 56th St PM (Future (2044))
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	52	0.0	52	0.0	0.175	5.1	LOS A	0.8	20.1	0.45	0.30	0.45	36.6
4	T1	All MCs	98	2.0	98	2.0	0.175	5.3	LOS A	0.8	20.1	0.45	0.30	0.45	37.1
14	R2	All MCs	26	0.0	26	0.0	0.175	5.1	LOS A	0.8	20.1	0.45	0.30	0.45	37.0
Approach			176	1.1	176	1.1	0.175	5.2	LOS A	0.8	20.1	0.45	0.30	0.45	36.9
West: Hesper Road															
5	L2	All MCs	30	0.0	30	0.0	0.171	4.5	LOS A	0.8	20.0	0.37	0.21	0.37	37.2
2	T1	All MCs	134	3.0	134	3.0	0.171	4.8	LOS A	0.8	20.0	0.37	0.21	0.37	37.5
12	R2	All MCs	22	9.1	22	9.1	0.171	5.3	LOS A	0.8	20.0	0.37	0.21	0.37	36.2
Approach			186	3.2	186	3.2	0.171	4.8	LOS A	0.8	20.0	0.37	0.21	0.37	37.3
South: 56th Street West															
3	L2	All MCs	10	0.0	10	0.0	0.244	5.5	LOS A	1.2	30.7	0.42	0.25	0.42	37.1
8	T1	All MCs	214	0.0	214	0.0	0.244	5.5	LOS A	1.2	30.7	0.42	0.25	0.42	37.9
18	R2	All MCs	45	0.0	45	0.0	0.244	5.5	LOS A	1.2	30.7	0.42	0.25	0.42	37.6
Approach			268	0.0	268	0.0	0.244	5.5	LOS A	1.2	30.7	0.42	0.25	0.42	37.8
East: Hesper Road															
1	L2	All MCs	45	0.0	45	0.0	0.382	7.3	LOS A	2.2	54.6	0.51	0.32	0.51	35.9
6	T1	All MCs	242	0.0	242	0.0	0.382	7.3	LOS A	2.2	54.6	0.51	0.32	0.51	36.6
16	R2	All MCs	120	0.0	120	0.0	0.382	7.3	LOS A	2.2	54.6	0.51	0.32	0.51	36.3
Approach			407	0.0	407	0.0	0.382	7.3	LOS A	2.2	54.6	0.51	0.32	0.51	36.4
All Vehicles			1037	0.8	1037	0.8	0.382	6.0	LOS A	2.2	54.6	0.45	0.28	0.45	37.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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APPENDIX G

FUTURE (2044) ALTERNATIVE CAPACITY CALCULATIONS

Appendix G Contents

Future (2044) Alternative Capacity Calculations 438

Future (2044) Alternative Capacity Calculations

Future AM Capacity:

Queues
2: 54th Street West & Rimrock Road 10/14/2025

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	1081	214	221	57	36	334	184	119
v/c Ratio	0.01	0.79	0.84	0.22	0.07	0.11	0.50	1.04	0.22
Control Delay (s/veh)	13.5	39.5	80.3	15.1	4.2	31.7	7.8	121.5	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.5	39.5	80.3	15.1	4.2	31.7	7.8	121.5	32.8
Queue Length 50th (ft)	1	453	184	91	0	23	19	162	74
Queue Length 95th (ft)	9	586	#323	170	25	51	94	#318	123
Internal Link Dist (ft)		4323		924			5202		920
Turn Bay Length (ft)	250		250		250	200		150	
Base Capacity (vph)	267	1362	295	998	818	427	770	226	680
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.79	0.73	0.22	0.07	0.08	0.43	0.81	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	882	112	197	203	52	33	29	278	169	103	6
Future Volume (veh/h)	2	882	112	197	203	52	33	29	278	169	103	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	385	1723	1750	1723	1695	1600	1668	1750	1736	1709	1750	1750
Adj Flow Rate, veh/h	2	959	122	214	221	57	36	32	302	184	112	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	100	2	0	2	4	11	6	0	1	3	0	0
Cap, veh/h	148	1132	144	237	900	720	443	52	495	242	592	37
Arrive On Green	0.00	0.39	0.39	0.14	0.53	0.53	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	367	2921	371	1641	1695	1356	1232	144	1361	1038	1630	102
Grp Volume(v), veh/h	2	537	544	214	221	57	36	0	334	184	0	119
Grp Sat Flow(s),veh/h/ln	367	1637	1656	1641	1695	1356	1232	0	1505	1038	0	1732
Q Serve(g_s), s	0.2	40.9	40.9	17.5	9.6	2.8	2.8	0.0	24.8	24.1	0.0	6.4
Cycle Q Clear(g_c), s	0.2	40.9	40.9	17.5	9.6	2.8	9.2	0.0	24.8	48.9	0.0	6.4
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.90	1.00		0.06
Lane Grp Cap(c), veh/h	148	634	642	237	900	720	443	0	547	242	0	629
V/C Ratio(X)	0.01	0.85	0.85	0.90	0.25	0.08	0.08	0.00	0.61	0.76	0.00	0.19
Avail Cap(c_a), veh/h	159	634	642	276	900	720	443	0	547	242	0	629
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	25.7	38.2	38.2	57.6	17.3	15.7	32.9	0.0	35.6	55.6	0.0	29.7
Incr Delay (d2), s/veh	0.0	13.2	13.1	28.1	0.6	0.2	0.1	0.0	2.0	13.3	0.0	0.1
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	0.0	17.7	17.9	9.0	3.8	0.9	0.8	0.0	9.1	7.2	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.7	51.3	51.2	85.7	18.0	15.9	33.0	0.0	37.6	68.9	0.0	29.9
LnGrp LOS	C	D	D	F	B	B	C		D	E		C
Approach Vol, veh/h		1083			492			370			303	
Approach Delay, s/veh		51.2			47.2			37.1			53.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.7	59.0		55.0	3.2	78.6		55.0				
Change Period (Y+Rc), s	3.0	6.0		5.3	3.0	6.0		5.3				
Max Green Setting (Gmax), s	23.0	53.0		49.7	4.0	72.0		49.7				
Max Q Clear Time (g_c+I1), s	19.5	42.9		50.9	2.2	11.6		26.8				
Green Ext Time (p_c), s	0.2	4.3		0.0	0.0	1.4		2.1				

Intersection Summary		
HCM 7th Control Delay, s/veh	48.3	
HCM 7th LOS	D	

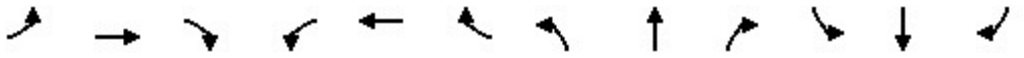
Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	1229	176	549	57	196
v/c Ratio	0.83	0.74	0.26	0.31	0.52
Control Delay (s/veh)	19.3	44.6	4.1	23.9	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	19.3	44.6	4.1	23.9	9.2
Queue Length 50th (ft)	151	56	27	16	0
Queue Length 95th (ft)	#309	#157	56	42	47
Internal Link Dist (ft)	3542		1579	5173	
Turn Bay Length (ft)		200			200
Base Capacity (vph)	1493	238	2172	368	557
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.82	0.74	0.25	0.15	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	884	247	162	505	0	52	0	180	0	0	0
Future Volume (veh/h)	0	884	247	162	505	0	52	0	180	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1695	1641	1709	1750	1600	1750	1627	1750	1750	1750
Adj Flow Rate, veh/h	0	961	268	176	549	0	57	0	196	0	0	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, %	0	1	4	8	3	0	11	0	9	0	0	0
Cap, veh/h	142	1117	311	214	2059	0	408	0	255	0	323	0
Arrive On Green	0.00	0.44	0.44	0.14	0.63	0.00	0.18	0.00	0.18	0.00	0.00	0.00
Sat Flow, veh/h	872	2550	709	1563	3333	0	1440	0	1379	0	1750	0
Grp Volume(v), veh/h	0	621	608	176	549	0	57	0	196	0	0	0
Grp Sat Flow(s),veh/h/ln	872	1650	1609	1563	1624	0	1440	0	1379	0	1750	0
Q Serve(g_s), s	0.0	17.2	17.4	5.6	3.8	0.0	1.7	0.0	6.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	17.2	17.4	5.6	3.8	0.0	1.7	0.0	6.9	0.0	0.0	0.0
Prop In Lane	1.00		0.44	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	142	723	705	214	2059	0	408	0	255	0	323	0
V/C Ratio(X)	0.00	0.86	0.86	0.82	0.27	0.00	0.14	0.00	0.77	0.00	0.00	0.00
Avail Cap(c_a), veh/h	168	773	754	246	2224	0	595	0	434	0	551	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)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.9	12.9	21.3	4.1	0.0	17.6	0.0	19.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	9.1	9.7	17.7	0.1	0.0	0.2	0.0	4.9	0.0	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	0.0	6.6	6.6	2.9	0.7	0.0	0.5	0.0	2.3	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	22.0	22.6	39.0	4.2	0.0	17.7	0.0	24.5	0.0	0.0	0.0
LnGrp LOS		C	C	D	A		B		C			
Approach Vol, veh/h		1229			725			253			0	
Approach Delay, s/veh		22.3			12.6			23.0			0.0	
Approach LOS		C			B			C				

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	26.9		14.0		36.8		14.0				
Change Period (Y+Rc), s	3.0	4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s	8.0	23.8		16.0		34.8		16.0				
Max Q Clear Time (g_c+I1), s	7.6	19.4		8.9		5.8		0.0				
Green Ext Time (p_c), s	0.0	2.9		0.5		3.8		0.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			19.2									
HCM 7th LOS			B									

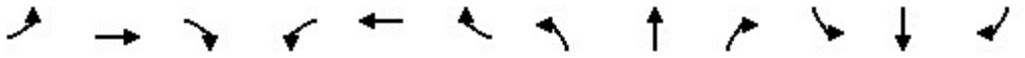
Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	42	1356	133	550	70	183	28
v/c Ratio	0.07	0.69	0.64	0.25	0.38	0.48	0.13
Control Delay (s/veh)	3.3	13.5	42.1	5.5	28.0	8.8	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	3.3	13.5	42.1	5.5	28.0	8.8	22.3
Queue Length 50th (ft)	3	180	45	26	22	0	9
Queue Length 95th (ft)	11	#313	#124	80	54	45	27
Internal Link Dist (ft)		3521		424	5188		424
Turn Bay Length (ft)						120	
Base Capacity (vph)	615	1969	213	2188	255	461	286
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.69	0.62	0.25	0.27	0.40	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	1057	190	122	436	70	48	17	168	17	9	0
Future Volume (veh/h)	39	1057	190	122	436	70	48	17	168	17	9	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1736	1723	1695	1750	1545	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	42	1149	207	133	474	76	52	18	183	18	10	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, %	0	1	1	2	4	0	15	0	0	0	0	0
Cap, veh/h	627	1466	263	165	1645	262	276	78	233	211	93	0
Arrive On Green	0.03	0.52	0.52	0.10	0.59	0.59	0.16	0.16	0.16	0.16	0.16	0.00
Sat Flow, veh/h	1667	2795	501	1641	2782	444	1047	500	1483	669	591	0
Grp Volume(v), veh/h	42	676	680	133	273	277	70	0	183	28	0	0
Grp Sat Flow(s),veh/h/ln	1667	1650	1646	1641	1611	1616	1547	0	1483	1260	0	0
Q Serve(g_s), s	0.6	18.5	18.7	4.4	4.7	4.7	0.0	0.0	6.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	18.5	18.7	4.4	4.7	4.7	2.0	0.0	6.7	2.0	0.0	0.0
Prop In Lane	1.00		0.30	1.00		0.27	0.74		1.00	0.64		0.00
Lane Grp Cap(c), veh/h	627	865	864	165	952	955	355	0	233	303	0	0
V/C Ratio(X)	0.07	0.78	0.79	0.80	0.29	0.29	0.20	0.00	0.79	0.09	0.00	0.00
Avail Cap(c_a), veh/h	719	865	864	205	952	955	424	0	302	366	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	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.6	10.7	10.8	24.7	5.6	5.7	20.8	0.0	22.7	20.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	6.9	7.2	16.9	0.8	0.8	0.3	0.0	9.9	0.1	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	6.6	6.7	2.3	1.3	1.3	0.8	0.0	2.7	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	5.6	17.7	18.0	41.5	6.4	6.4	21.0	0.0	32.6	20.4	0.0	0.0
LnGrp LOS	A	B	B	D	A	A	C		C	C		
Approach Vol, veh/h		1398			683			253			28	
Approach Delay, s/veh		17.4			13.3			29.4			20.4	
Approach LOS		B			B			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.4	8.6	34.0		13.4	4.9	37.7				
Change Period (Y+Rc), s		4.6	3.0	4.6		4.6	3.0	4.6				
Max Green Setting (Gmax), s		11.4	7.0	29.4		11.4	5.0	31.4				
Max Q Clear Time (g_c+I1), s		8.7	6.4	20.7		4.0	2.6	6.7				
Green Ext Time (p_c), s		0.3	0.0	5.4		0.0	0.0	3.3				

Intersection Summary	
HCM 7th Control Delay, s/veh	17.6
HCM 7th LOS	B

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	522	216	93	211
v/c Ratio	0.74	0.33	0.21	0.58
Control Delay (s/veh)	18.1	9.1	11.8	21.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	18.1	9.1	11.8	21.1
Queue Length 50th (ft)	97	29	12	41
Queue Length 95th (ft)	238	82	47	119
Internal Link Dist (ft)	5212	417	5184	5199
Turn Bay Length (ft)				
Base Capacity (vph)	1152	1076	728	607
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.20	0.13	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	440	9	15	153	31	9	52	24	120	52	22
Future Volume (veh/h)	31	440	9	15	153	31	9	52	24	120	52	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1668	1682	1750	1750	1614	1668	1477	1695	1641	1723	1695	1641
Adj Flow Rate, veh/h	34	478	10	16	166	34	10	57	26	130	57	24
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, %	6	5	0	0	10	6	20	4	8	2	4	8
Cap, veh/h	144	656	13	140	524	101	144	234	98	358	109	36
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	51	1570	32	41	1252	242	78	1073	447	791	498	165
Grp Volume(v), veh/h	522	0	0	216	0	0	93	0	0	211	0	0
Grp Sat Flow(s),veh/h/ln	1653	0	0	1534	0	0	1598	0	0	1455	0	0
Q Serve(g_s), s	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0
Cycle Q Clear(g_c), s	8.3	0.0	0.0	2.9	0.0	0.0	1.5	0.0	0.0	4.0	0.0	0.0
Prop In Lane	0.07		0.02	0.07		0.16	0.11		0.28	0.62		0.11
Lane Grp Cap(c), veh/h	813	0	0	765	0	0	476	0	0	503	0	0
V/C Ratio(X)	0.64	0.00	0.00	0.28	0.00	0.00	0.20	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	1653	0	0	1525	0	0	1097	0	0	1059	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.7	0.0	0.0	6.2	0.0	0.0	10.2	0.0	0.0	11.1	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.2	0.0	0.0	0.2	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	1.2	0.0	0.0	0.4	0.0	0.0	0.3	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	8.6	0.0	0.0	6.4	0.0	0.0	10.4	0.0	0.0	11.6	0.0	0.0
LnGrp LOS	A			A			B			B		
Approach Vol, veh/h		522			216			93			211	
Approach Delay, s/veh		8.6			6.4			10.4			11.6	
Approach LOS		A			A			B			B	

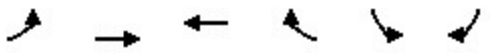
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		12.5		18.8		12.5		18.8				
Change Period (Y+Rc), s		5.7		5.7		5.7		5.7				
Max Green Setting (Gmax), s		19.3		29.3		19.3		29.3				
Max Q Clear Time (g_c+I1), s		3.5		10.3		6.0		4.9				
Green Ext Time (p_c), s		0.3		2.8		0.8		1.1				

Intersection Summary		
HCM 7th Control Delay, s/veh	8.9	
HCM 7th LOS	A	

Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Group Flow (vph)	62	316	183	66	426
v/c Ratio	0.17	0.55	0.34	0.14	0.69
Control Delay (s/veh)	10.3	14.5	11.6	3.9	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	10.3	14.5	11.6	3.9	17.3
Queue Length 50th (ft)	9	52	29	0	61
Queue Length 95th (ft)	27	110	68	18	#200
Internal Link Dist (ft)		1482	3542		5231
Turn Bay Length (ft)					
Base Capacity (vph)	721	1111	1049	875	782
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.28	0.17	0.08	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



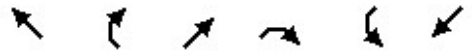
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	291	168	61	298	94
Future Volume (veh/h)	57	291	168	61	298	94
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1750	1736	1654	1586	1736	1750
Adj Flow Rate, veh/h	62	316	183	66	324	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	1	7	12	1	0
Cap, veh/h	480	497	473	385	415	131
Arrive On Green	0.29	0.29	0.29	0.29	0.34	0.34
Sat Flow, veh/h	1149	1736	1654	1344	1219	384
Grp Volume(v), veh/h	62	316	183	66	427	0
Grp Sat Flow(s),veh/h/ln	1149	1736	1654	1344	1606	0
Q Serve(g_s), s	1.3	4.5	2.5	1.0	6.8	0.0
Cycle Q Clear(g_c), s	3.8	4.5	2.5	1.0	6.8	0.0
Prop In Lane	1.00			1.00	0.76	0.24
Lane Grp Cap(c), veh/h	480	497	473	385	547	0
V/C Ratio(X)	0.13	0.64	0.39	0.17	0.78	0.00
Avail Cap(c_a), veh/h	1070	1388	1323	1075	945	0
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	9.7	8.8	8.1	7.6	8.4	0.0
Incr Delay (d2), s/veh	0.1	1.4	0.5	0.2	2.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.0	0.5	0.2	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	9.8	10.2	8.7	7.8	10.9	0.0
LnGrp LOS	A	B	A	A	B	
Approach Vol, veh/h		378	249		427	
Approach Delay, s/veh		10.1	8.4		10.9	
Approach LOS		B	A		B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		13.4		15.0		13.4
Change Period (Y+Rc), s		5.3		5.3		5.3
Max Green Setting (Gmax), s		22.7		16.7		22.7
Max Q Clear Time (g_c+I1), s		6.5		8.8		4.5
Green Ext Time (p_c), s		1.7		0.9		1.0

Intersection Summary	
HCM 7th Control Delay, s/veh	10.0
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.



Lane Group	NWT	NWR	NET	NER	SWL	SWT
Lane Group Flow (vph)	134	302	421	172	160	210
v/c Ratio	0.53	0.44	0.79	0.29	0.79	0.28
Control Delay (s/veh)	31.9	3.3	32.8	4.7	58.4	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	31.9	3.3	32.8	4.7	58.4	10.9
Queue Length 50th (ft)	49	0	155	0	63	49
Queue Length 95th (ft)	97	30	#337	40	#172	108
Internal Link Dist (ft)	347		798			232
Turn Bay Length (ft)		250		200	200	
Base Capacity (vph)	377	694	553	605	203	766
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.44	0.76	0.28	0.79	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	123	0	278	0	387	158	147	193	0
Future Volume (veh/h)	0	0	0	123	0	278	0	387	158	147	193	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1723	1723	1573	1723	1736	1723	1614	1682	1709	1491	1723
Adj Flow Rate, veh/h	0	0	0	134	0	0	0	421	172	160	210	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	13	2	1	2	10	5	3	19	2
Cap, veh/h	0	5	0	236	0		0	566	500	200	832	0
Arrive On Green	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.35	0.35	0.12	0.56	0.00
Sat Flow, veh/h	0	1723	0	1641	0	1471	0	1614	1425	1628	1491	0
Grp Volume(v), veh/h	0	0	0	134	0	0	0	421	172	160	210	0
Grp Sat Flow(s),veh/h/ln	0	1723	0	1641	0	1471	0	1614	1425	1628	1491	0
Q Serve(g_s), s	0.0	0.0	0.0	2.7	0.0	0.0	0.0	8.2	3.2	3.4	2.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.7	0.0	0.0	0.0	8.2	3.2	3.4	2.6	0.0
Prop In Lane	0.00		0.00	1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	5	0	236	0		0	566	500	200	832	0
V/C Ratio(X)	0.00	0.00	0.00	0.57	0.00		0.00	0.74	0.34	0.80	0.25	0.00
Avail Cap(c_a), veh/h	0	775	0	752	0		0	1002	885	366	1387	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)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	14.2	0.0	0.0	0.0	10.1	8.5	15.2	4.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.1	0.0	0.0	0.0	2.0	0.4	7.3	0.2	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	0.0	0.0	0.0	0.9	0.0	0.0	0.0	1.9	0.6	1.3	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	0.0	16.3	0.0	0.0	0.0	12.1	8.9	22.4	4.2	0.0
LnGrp LOS				B				B	A	C	A	
Approach Vol, veh/h		0			134			593			370	
Approach Delay, s/veh		0.0			16.3			11.2			12.1	
Approach LOS					B			B			B	

Timer - Assigned Phs		2	3	4		6		8				
Phs Duration (G+Y+Rc), s		10.4	7.4	17.8		0.0		25.2				
Change Period (Y+Rc), s		5.3	3.0	5.3		4.0		5.3				
Max Green Setting (Gmax), s		16.3	8.0	22.1		16.0		33.1				
Max Q Clear Time (g_c+I1), s		4.7	5.4	10.2		0.0		4.6				
Green Ext Time (p_c), s		0.4	0.1	2.3		0.0		1.1				

Intersection Summary	
HCM 7th Control Delay, s/veh	12.1
HCM 7th LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1335	68	37	460	15	74
Future Vol, veh/h	1335	68	37	460	15	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	3	0	3	0	3
Mvmt Flow	1451	74	40	500	16	80

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1525	0	2068	1488
Stage 1	-	-	-	-	1488	-
Stage 2	-	-	-	-	580	-
Critical Hdwy	-	-	4.1	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.327
Pot Cap-1 Maneuver	-	-	443	-	60	152
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	564	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	443	-	55	152
Mov Cap-2 Maneuver	-	-	-	-	187	-
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	512	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	1.04	48.32
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	187	152	-	-	443	-
HCM Lane V/C Ratio	0.087	0.53	-	-	0.091	-
HCM Ctrl Dly (s/v)	26.1	52.8	-	-	13.9	-
HCM Lane LOS	D	F	-	-	B	-
HCM 95th %tile Q(veh)	0.3	2.6	-	-	0.3	-

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Future PM Capacity:

Queues

2: 54th Street West & Rimrock Road 10/14/2025

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	385	272	723	157	145	289	118	66
v/c Ratio	0.01	0.34	0.72	0.70	0.17	0.52	0.62	0.83	0.17
Control Delay (s/veh)	7.3	19.7	37.3	16.9	2.3	32.0	18.2	71.4	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.3	19.7	37.3	16.9	2.3	32.0	18.2	71.4	21.6
Queue Length 50th (ft)	1	67	115	206	0	56	49	51	20
Queue Length 95th (ft)	4	115	196	#510	28	117	133	#145	54
Internal Link Dist (ft)		4323		924			5202		920
Turn Bay Length (ft)	250		250		250	200		150	
Base Capacity (vph)	405	1140	518	1039	947	356	547	180	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.34	0.53	0.70	0.17	0.41	0.53	0.66	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	319	35	250	665	144	133	74	192	109	53	7
Future Volume (veh/h)	4	319	35	250	665	144	133	74	192	109	53	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1750
Adj Flow Rate, veh/h	4	347	38	272	723	157	145	80	209	118	58	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	3	3	0	0
Cap, veh/h	236	1050	114	318	931	789	424	116	303	208	407	56
Arrive On Green	0.01	0.35	0.35	0.19	0.53	0.53	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1667	3024	329	1667	1750	1483	1357	429	1120	1082	1505	208
Grp Volume(v), veh/h	4	190	195	272	723	157	145	0	289	118	0	66
Grp Sat Flow(s),veh/h/ln	1667	1663	1691	1667	1750	1483	1357	0	1548	1082	0	1713
Q Serve(g_s), s	0.1	6.3	6.3	11.7	24.5	4.1	6.8	0.0	12.5	7.6	0.0	2.2
Cycle Q Clear(g_c), s	0.1	6.3	6.3	11.7	24.5	4.1	8.9	0.0	12.5	20.1	0.0	2.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.72	1.00		0.12
Lane Grp Cap(c), veh/h	236	577	587	318	931	789	424	0	418	208	0	463
V/C Ratio(X)	0.02	0.33	0.33	0.86	0.78	0.20	0.34	0.00	0.69	0.57	0.00	0.14
Avail Cap(c_a), veh/h	361	577	587	493	931	789	424	0	418	208	0	463
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	16.4	17.9	17.9	29.1	13.9	9.1	24.0	0.0	24.4	33.6	0.0	20.6
Incr Delay (d2), s/veh	0.0	1.5	1.5	8.8	6.3	0.6	0.5	0.0	4.8	3.6	0.0	0.1
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	0.0	2.3	2.3	5.1	9.1	1.2	2.0	0.0	4.7	2.3	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	16.4	19.4	19.5	38.0	20.2	9.7	24.5	0.0	29.1	37.2	0.0	20.7
LnGrp LOS	B	B	B	D	C	A	C		C	D		C
Approach Vol, veh/h		389			1152			434			184	
Approach Delay, s/veh		19.4			22.9			27.6			31.3	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.2	31.8		25.4	3.4	45.6		25.4				
Change Period (Y+Rc), s	3.0	6.0		5.3	3.0	6.0		5.3				
Max Green Setting (Gmax), s	22.0	23.6		20.1	6.0	39.6		20.1				
Max Q Clear Time (g_c+I1), s	13.7	8.3		22.1	2.1	26.5		14.5				
Green Ext Time (p_c), s	0.5	1.6		0.0	0.0	4.2		1.0				

Intersection Summary		
HCM 7th Control Delay, s/veh		24.0
HCM 7th LOS		C

Lane Group	EBT	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	722	214	683	152	348
v/c Ratio	0.68	0.55	0.37	0.49	0.57
Control Delay (s/veh)	19.3	25.1	6.6	24.3	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	19.3	25.1	6.6	24.3	6.8
Queue Length 50th (ft)	94	61	45	43	0
Queue Length 95th (ft)	#175	130	90	92	55
Internal Link Dist (ft)	3542		1579	5173	
Turn Bay Length (ft)		200			
Base Capacity (vph)	1295	520	2376	490	757
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.56	0.41	0.29	0.31	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	552	112	197	628	0	140	0	320	0	0	0
Future Volume (veh/h)	0	552	112	197	628	0	140	0	320	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1723	1723	1750	1750	1736	1750	1709	1750	1750	1750
Adj Flow Rate, veh/h	0	600	122	214	683	0	152	0	348	0	0	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, %	0	1	2	2	0	0	1	0	3	0	0	0
Cap, veh/h	154	794	161	269	1723	0	565	0	413	0	500	0
Arrive On Green	0.00	0.29	0.29	0.16	0.52	0.00	0.29	0.00	0.29	0.00	0.00	0.00
Sat Flow, veh/h	770	2732	554	1641	3413	0	1440	0	1448	0	1750	0
Grp Volume(v), veh/h	0	362	360	214	683	0	152	0	348	0	0	0
Grp Sat Flow(s),veh/h/ln	770	1650	1637	1641	1663	0	1440	0	1448	0	1750	0
Q Serve(g_s), s	0.0	9.3	9.4	5.9	5.8	0.0	4.0	0.0	10.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.3	9.4	5.9	5.8	0.0	4.0	0.0	10.6	0.0	0.0	0.0
Prop In Lane	1.00		0.34	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	154	479	475	269	1723	0	565	0	413	0	500	0
V/C Ratio(X)	0.00	0.75	0.76	0.80	0.40	0.00	0.27	0.00	0.84	0.00	0.00	0.00
Avail Cap(c_a), veh/h	216	612	608	490	2441	0	658	0	507	0	612	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)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	15.1	15.1	18.8	6.8	0.0	13.4	0.0	15.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.0	4.1	5.4	0.1	0.0	0.3	0.0	10.3	0.0	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	0.0	3.4	3.4	2.3	1.4	0.0	1.1	0.0	4.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	19.1	19.3	24.2	7.0	0.0	13.6	0.0	26.0	0.0	0.0	0.0
LnGrp LOS		B	B	C	A		B		C			
Approach Vol, veh/h		722			897			500			0	
Approach Delay, s/veh		19.2			11.1			22.3			0.0	
Approach LOS		B			B			C				

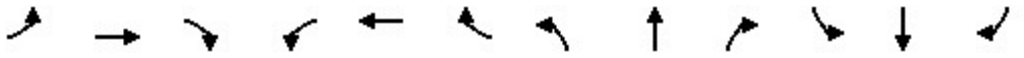
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.7	18.2		18.0		28.9		18.0				
Change Period (Y+Rc), s	3.0	4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s	14.0	17.4		16.4		34.4		16.4				
Max Q Clear Time (g_c+I1), s	7.9	11.4		12.6		7.8		0.0				
Green Ext Time (p_c), s	0.3	2.2		0.8		4.9		0.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			16.5									
HCM 7th LOS			B									

Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	702	224	1140	171	118	9
v/c Ratio	0.46	0.51	0.50	0.49	0.24	0.03
Control Delay (s/veh)	15.0	24.7	7.0	25.1	4.7	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.0	24.7	7.0	25.1	4.7	17.8
Queue Length 50th (ft)	96	66	98	51	0	2
Queue Length 95th (ft)	155	#151	157	109	27	12
Internal Link Dist (ft)	3521		424	5188		424
Turn Bay Length (ft)					120	
Base Capacity (vph)	1625	612	2304	531	689	544
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.37	0.49	0.32	0.17	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	543	103	206	1040	9	157	0	109	6	2	0
Future Volume (veh/h)	0	543	103	206	1040	9	157	0	109	6	2	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1750	1736	1750	1750	1750	1750	1736	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	0	590	112	224	1130	10	171	0	118	7	2	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, %	0	1	0	0	0	0	1	0	0	0	0	0
Cap, veh/h	367	909	172	287	1969	17	456	0	244	249	48	0
Arrive On Green	0.00	0.33	0.33	0.17	0.58	0.58	0.16	0.00	0.16	0.16	0.16	0.00
Sat Flow, veh/h	1667	2768	524	1667	3377	30	1571	0	1483	449	293	0
Grp Volume(v), veh/h	0	351	351	224	556	584	171	0	118	9	0	0
Grp Sat Flow(s),veh/h/ln	1667	1650	1642	1667	1663	1745	1571	0	1483	742	0	0
Q Serve(g_s), s	0.0	6.6	6.7	4.7	7.6	7.6	0.0	0.0	2.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.6	6.7	4.7	7.6	7.6	3.5	0.0	2.6	3.5	0.0	0.0
Prop In Lane	1.00		0.32	1.00		0.02	1.00		1.00	0.78		0.00
Lane Grp Cap(c), veh/h	367	542	539	287	969	1017	456	0	244	298	0	0
V/C Ratio(X)	0.00	0.65	0.65	0.78	0.57	0.57	0.37	0.00	0.48	0.03	0.00	0.00
Avail Cap(c_a), veh/h	545	922	918	594	1340	1406	787	0	585	614	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)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	10.4	10.5	14.4	4.8	4.8	14.2	0.0	13.8	12.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.3	4.6	0.5	0.5	0.5	0.0	1.5	0.0	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	0.0	1.8	1.8	1.7	1.1	1.1	1.1	0.0	0.8	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	11.8	11.8	19.0	5.3	5.3	14.7	0.0	15.3	12.9	0.0	0.0
LnGrp LOS		B	B	B	A	A	B		B	B		
Approach Vol, veh/h		702			1364			289			9	
Approach Delay, s/veh		11.8			7.5			14.9			12.9	
Approach LOS		B			A			B			B	

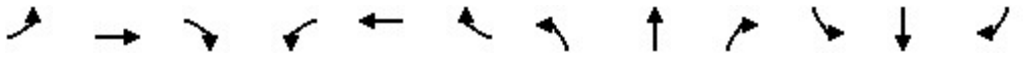
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	16.6		10.6	0.0	25.9		10.6				
Change Period (Y+Rc), s	3.0	4.6		4.6	3.0	4.6		4.6				
Max Green Setting (Gmax), s	13.0	20.4		14.4	4.0	29.4		14.4				
Max Q Clear Time (g_c+I1), s	6.7	8.7		5.5	0.0	9.6		5.5				
Green Ext Time (p_c), s	0.3	3.3		0.8	0.0	7.4		0.0				

Intersection Summary	
HCM 7th Control Delay, s/veh	9.7
HCM 7th LOS	A

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	330	721	125	110
v/c Ratio	0.37	0.81	0.36	0.39
Control Delay (s/veh)	7.3	17.3	16.4	20.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.3	17.3	16.4	20.0
Queue Length 50th (ft)	41	123	20	22
Queue Length 95th (ft)	95	#360	61	62
Internal Link Dist (ft)	5212	417	5184	5199
Turn Bay Length (ft)				
Base Capacity (vph)	1191	1195	689	575
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.60	0.18	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	287	2	46	540	77	4	76	35	35	50	17
Future Volume (veh/h)	15	287	2	46	540	77	4	76	35	35	50	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1573	1723	1750	1750	1736	1750	1750	1750	1750	1682	1750	1750
Adj Flow Rate, veh/h	16	312	2	50	587	84	4	83	38	38	54	18
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, %	13	2	0	0	1	0	0	0	0	5	0	0
Cap, veh/h	123	881	5	142	753	104	110	156	70	199	128	37
Arrive On Green	0.53	0.53	0.53	0.53	0.53	0.53	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	27	1650	10	60	1411	194	27	1122	502	430	922	264
Grp Volume(v), veh/h	330	0	0	721	0	0	125	0	0	110	0	0
Grp Sat Flow(s),veh/h/ln	1687	0	0	1665	0	0	1652	0	0	1616	0	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.9	0.0	0.0	12.2	0.0	0.0	2.4	0.0	0.0	2.1	0.0	0.0
Prop In Lane	0.05		0.01	0.07		0.12	0.03		0.30	0.35		0.16
Lane Grp Cap(c), veh/h	1009	0	0	999	0	0	336	0	0	363	0	0
V/C Ratio(X)	0.33	0.00	0.00	0.72	0.00	0.00	0.37	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	1601	0	0	1594	0	0	924	0	0	907	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.7	0.0	0.0	6.6	0.0	0.0	14.0	0.0	0.0	13.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.0	0.0	0.0	0.7	0.0	0.0	0.5	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	0.3	0.0	0.0	1.5	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	4.9	0.0	0.0	7.6	0.0	0.0	14.7	0.0	0.0	14.3	0.0	0.0
LnGrp LOS	A			A			B			B		
Approach Vol, veh/h		330			721			125			110	
Approach Delay, s/veh		4.9			7.6			14.7			14.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	10.5	24.3	10.5	24.3
Change Period (Y+Rc), s	5.7	5.7	5.7	5.7
Max Green Setting (Gmax), s	17.3	31.3	17.3	31.3
Max Q Clear Time (g_c+I1), s	4.4	5.9	4.1	14.2
Green Ext Time (p_c), s	0.4	1.8	0.3	4.4

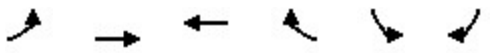
Intersection Summary	
HCM 7th Control Delay, s/veh	8.1
HCM 7th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Group Flow (vph)	110	292	380	234	178
v/c Ratio	0.29	0.42	0.54	0.32	0.39
Control Delay (s/veh)	8.8	8.9	10.5	2.5	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	8.8	8.9	10.5	2.5	9.6
Queue Length 50th (ft)	10	29	40	0	12
Queue Length 95th (ft)	37	80	106	24	55
Internal Link Dist (ft)		1482	3542		5231
Turn Bay Length (ft)					
Base Capacity (vph)	672	1242	1254	1132	968
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.24	0.30	0.21	0.18

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	269	350	215	87	76
Future Volume (veh/h)	101	269	350	215	87	76
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1750	1736	1750	1750	1750	1750
Adj Flow Rate, veh/h	110	292	380	234	95	83
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	1	0	0	0	0
Cap, veh/h	475	722	727	616	160	140
Arrive On Green	0.42	0.42	0.42	0.42	0.19	0.19
Sat Flow, veh/h	821	1736	1750	1483	837	731
Grp Volume(v), veh/h	110	292	380	234	179	0
Grp Sat Flow(s),veh/h/ln	821	1736	1750	1483	1577	0
Q Serve(g_s), s	3.1	3.2	4.4	3.0	2.8	0.0
Cycle Q Clear(g_c), s	7.5	3.2	4.4	3.0	2.8	0.0
Prop In Lane	1.00			1.00	0.53	0.46
Lane Grp Cap(c), veh/h	475	722	727	616	302	0
V/C Ratio(X)	0.23	0.40	0.52	0.38	0.59	0.00
Avail Cap(c_a), veh/h	793	1396	1407	1192	1034	0
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	8.7	5.5	5.9	5.5	9.9	0.0
Incr Delay (d2), s/veh	0.2	0.4	0.6	0.4	1.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.4	0.5	0.3	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	8.9	5.9	6.5	5.9	11.8	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		402	614		179	
Approach Delay, s/veh		6.7	6.2		11.8	
Approach LOS		A	A		B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		16.5		10.5		16.5
Change Period (Y+Rc), s		5.3		5.3		5.3
Max Green Setting (Gmax), s		21.7		17.7		21.7
Max Q Clear Time (g_c+I1), s		9.5		4.8		6.4
Green Ext Time (p_c), s		1.7		0.4		2.5

Intersection Summary	
HCM 7th Control Delay, s/veh	7.2
HCM 7th LOS	A

Lane Group	NWT	NWR	NET	NER	SWL	SWT
Lane Group Flow (vph)	156	976	287	106	269	383
v/c Ratio	0.59	0.94	0.79	0.26	0.52	0.39
Control Delay (s/veh)	38.2	23.8	46.4	7.1	26.6	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.2	23.8	46.4	7.1	26.6	11.1
Queue Length 50th (ft)	69	72	131	0	103	91
Queue Length 95th (ft)	127	54	#241	29	189	170
Internal Link Dist (ft)	347		798			232
Turn Bay Length (ft)		250		200	200	
Base Capacity (vph)	369	1035	369	417	513	988
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.94	0.78	0.25	0.52	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	109	0	683	0	238	88	269	383	0
Future Volume (veh/h)	0	0	0	109	0	683	0	238	88	269	383	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1723	1723	1723	1723	1723	1723	1682	1750	1750	1736	1723
Adj Flow Rate, veh/h	0	0	0	156	0	0	0	287	106	269	383	0
Peak Hour Factor	0.92	0.92	0.92	0.70	0.92	0.70	0.92	0.83	0.83	1.00	1.00	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	0	0	1	2
Cap, veh/h	0	5	0	261	0		0	414	365	351	940	0
Arrive On Green	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.25	0.25	0.21	0.54	0.00
Sat Flow, veh/h	0	1723	0	1641	0	1460	0	1682	1483	1667	1736	0
Grp Volume(v), veh/h	0	0	0	156	0	0	0	287	106	269	383	0
Grp Sat Flow(s),veh/h/ln	0	1723	0	1641	0	1460	0	1682	1483	1667	1736	0
Q Serve(g_s), s	0.0	0.0	0.0	3.1	0.0	0.0	0.0	5.5	2.1	5.4	4.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.1	0.0	0.0	0.0	5.5	2.1	5.4	4.6	0.0
Prop In Lane	0.00		0.00	1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	5	0	261	0		0	414	365	351	940	0
V/C Ratio(X)	0.00	0.00	0.00	0.60	0.00		0.00	0.69	0.29	0.77	0.41	0.00
Avail Cap(c_a), veh/h	0	778	0	782	0		0	783	691	1082	2082	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)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	13.8	0.0	0.0	0.0	12.1	10.8	13.2	4.8	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.2	0.0	0.0	0.0	2.1	0.4	3.5	0.3	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	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.6	0.5	1.7	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	0.0	16.0	0.0	0.0	0.0	14.2	11.3	16.7	5.1	0.0
LnGrp LOS				B				B	B	B	A	
Approach Vol, veh/h		0			156			393			652	
Approach Delay, s/veh		0.0			16.0			13.4			9.9	
Approach LOS					B			B			A	

Timer - Assigned Phs	2	3	4		6		8					
Phs Duration (G+Y+Rc), s	10.9	10.5	14.0		0.0		24.5					
Change Period (Y+Rc), s	5.3	3.0	5.3		4.0		5.3					
Max Green Setting (Gmax), s	16.9	23.0	16.5		16.0		42.5					
Max Q Clear Time (g_c+I1), s	5.1	7.4	7.5		0.0		6.6					
Green Ext Time (p_c), s	0.5	0.6	1.2		0.0		2.2					

Intersection Summary	
HCM 7th Control Delay, s/veh	11.8
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

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

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	598	29	87	1120	26	35
Future Vol, veh/h	598	29	87	1120	26	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	0	0	5
Mvmt Flow	650	32	95	1217	28	38

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	682	0	2072	666
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	1407	-
Critical Hdwy	-	-	4.1	-	6.4	6.25
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.345
Pot Cap-1 Maneuver	-	-	921	-	60	454
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	229	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	921	-	54	454
Mov Cap-2 Maneuver	-	-	-	-	153	-
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	205	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.67	22.21
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	153	454	-	-	921	-
HCM Lane V/C Ratio	0.184	0.084	-	-	0.103	-
HCM Ctrl Dly (s/v)	33.7	13.6	-	-	9.4	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.3	-	-	0.3	-

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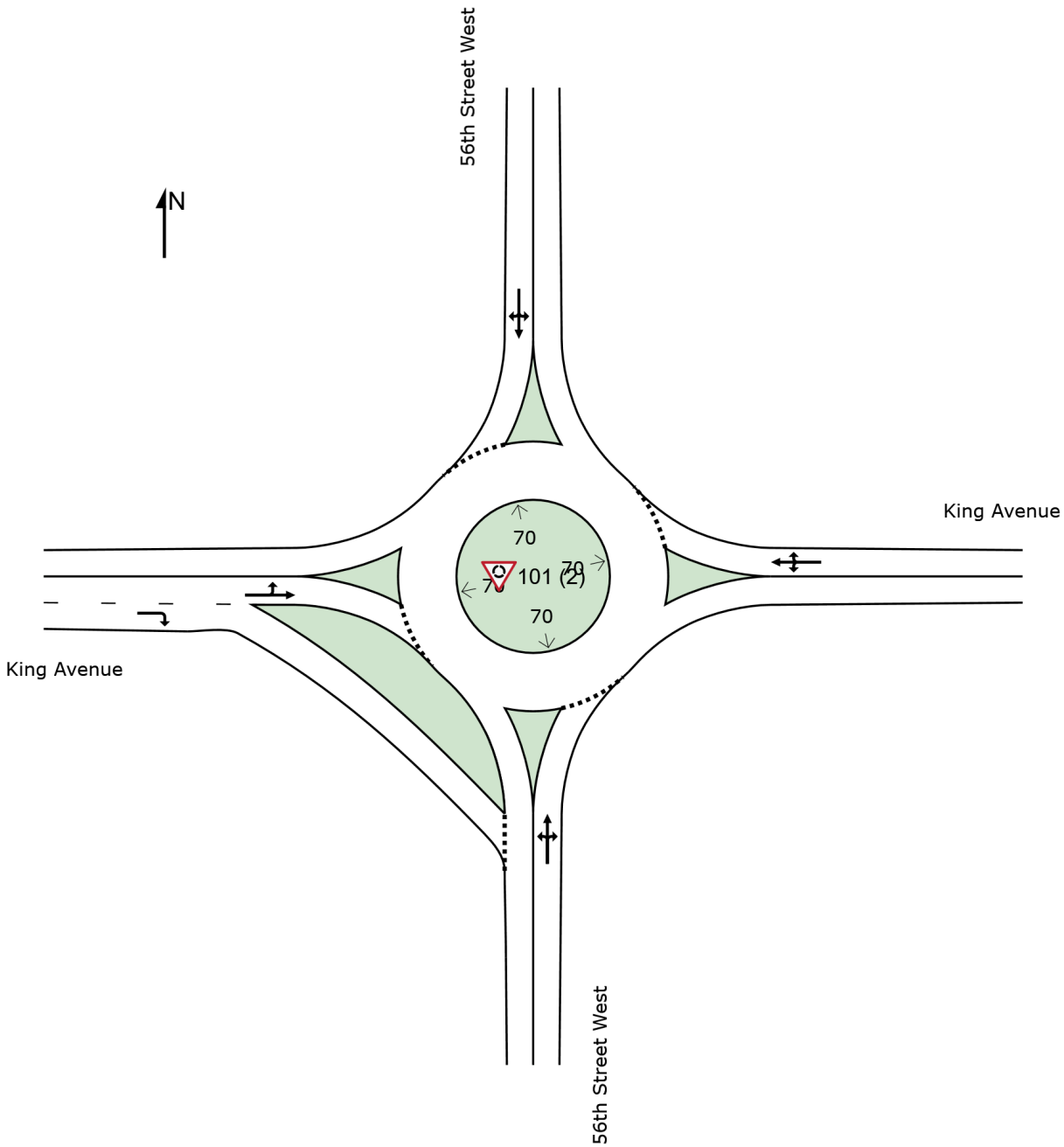
SITE LAYOUT

Site: [101 (2)] King Ave & 56th St AM Improved (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (2)] King Ave & 56th St AM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	133	3.0	133	3.0	0.572	12.6	LOS B	5.0	125.7	0.75	0.68	1.08	34.0
4	T1	All MCs	260	0.8	260	0.8	0.572	12.2	LOS B	5.0	125.7	0.75	0.68	1.08	33.4
14	R2	All MCs	100	0.0	100	0.0	0.572	12.1	LOS B	5.0	125.7	0.75	0.68	1.08	34.4
Approach			492	1.2	492	1.2	0.572	12.3	LOS B	5.0	125.7	0.75	0.68	1.08	33.8
West: King Avenue															
5	L2	All MCs	126	6.3	126	6.3	0.784	20.6	LOS C	12.6	320.4	0.92	0.95	1.81	30.2
2	T1	All MCs	599	1.3	599	1.3	0.784	19.7	LOS C	12.6	320.4	0.92	0.95	1.81	32.2
12	R2	All MCs	40	10.0	40	10.0	0.044	4.4	LOS A	0.2	4.4	0.41	0.27	0.41	38.8
Approach			765	2.6	765	2.6	0.784	19.0	LOS C	12.6	320.4	0.89	0.91	1.73	32.1
South: 56th Street West															
3	L2	All MCs	36	0.0	36	0.0	0.450	13.5	LOS B	2.2	56.7	0.76	0.79	1.00	33.5
8	T1	All MCs	154	3.9	154	3.9	0.450	14.6	LOS B	2.2	56.7	0.76	0.79	1.00	32.3
18	R2	All MCs	48	4.2	48	4.2	0.450	14.7	LOS B	2.2	56.7	0.76	0.79	1.00	33.1
Approach			238	3.4	238	3.4	0.450	14.4	LOS B	2.2	56.7	0.76	0.79	1.00	32.6
East: King Avenue															
1	L2	All MCs	34	5.9	34	5.9	0.458	9.4	LOS A	2.7	70.5	0.61	0.44	0.65	35.4
6	T1	All MCs	364	2.7	364	2.7	0.458	9.1	LOS A	2.7	70.5	0.61	0.44	0.65	38.0
16	R2	All MCs	30	20.0	30	20.0	0.458	11.3	LOS B	2.7	70.5	0.61	0.44	0.65	33.9
Approach			428	4.2	428	4.2	0.458	9.2	LOS A	2.7	70.5	0.61	0.44	0.65	37.4
All Vehicles			1924	2.7	1924	2.7	0.784	14.6	LOS B	12.6	320.4	0.78	0.73	1.23	33.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [102 (2)] King Ave & 56th St PM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	76	0.0	76	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.5
4	T1	All MCs	128	0.0	128	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	34.6
14	R2	All MCs	134	0.0	134	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.7
Approach			338	0.0	338	0.0	0.440	10.4	LOS B	2.6	65.4	0.70	0.63	0.86	35.2
West: King Avenue															
5	L2	All MCs	80	0.0	80	0.0	0.422	7.4	LOS A	2.4	59.7	0.49	0.30	0.49	37.1
2	T1	All MCs	395	1.5	395	1.5	0.422	7.6	LOS A	2.4	59.7	0.49	0.30	0.49	39.0
12	R2	All MCs	14	14.3	14	14.3	0.014	3.7	LOS A	0.1	1.4	0.29	0.13	0.29	38.5
Approach			489	1.6	489	1.6	0.422	7.4	LOS A	2.4	59.7	0.48	0.29	0.48	38.6
South: 56th Street West															
3	L2	All MCs	50	0.0	50	0.0	0.467	10.8	LOS B	3.0	74.8	0.71	0.65	0.92	36.5
8	T1	All MCs	272	0.0	272	0.0	0.467	10.8	LOS B	3.0	74.8	0.71	0.65	0.92	35.5
18	R2	All MCs	40	5.0	40	5.0	0.467	11.7	LOS B	3.0	74.8	0.71	0.65	0.92	35.9
Approach			362	0.6	362	0.6	0.467	10.9	LOS B	3.0	74.8	0.71	0.65	0.92	35.7
East: King Avenue															
1	L2	All MCs	34	0.0	34	0.0	0.708	16.1	LOS C	9.5	239.3	0.86	0.81	1.46	32.7
6	T1	All MCs	485	1.2	485	1.2	0.708	16.2	LOS C	9.5	239.3	0.86	0.81	1.46	34.2
16	R2	All MCs	122	0.0	122	0.0	0.708	16.1	LOS C	9.5	239.3	0.86	0.81	1.46	33.1
Approach			640	0.9	640	0.9	0.708	16.2	LOS C	9.5	239.3	0.86	0.81	1.46	33.9
All Vehicles			1829	0.9	1829	0.9	0.708	11.7	LOS B	9.5	239.3	0.70	0.61	0.98	35.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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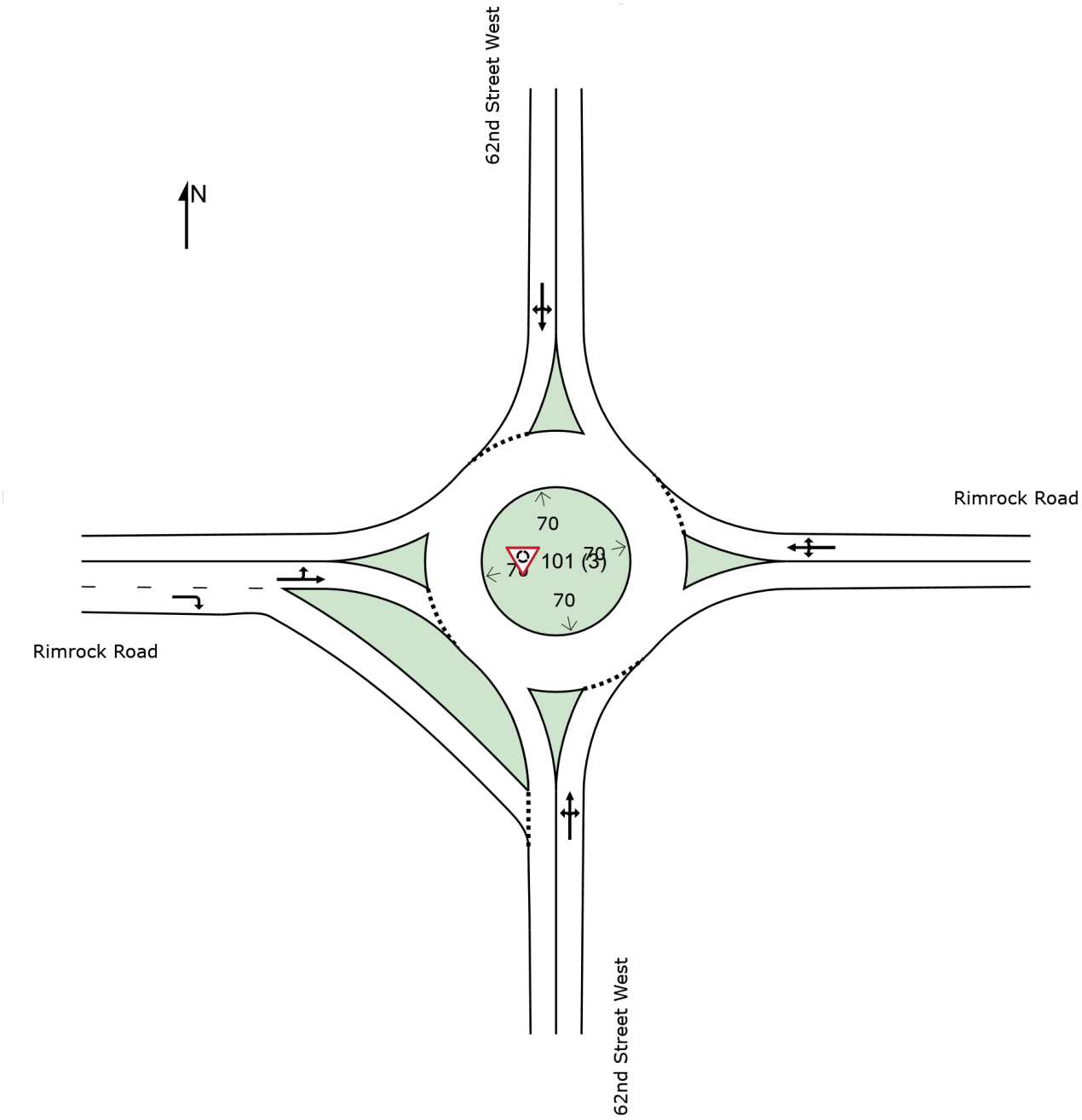
SITE LAYOUT

Site: [101 (3)] Rimrock Rd & 62nd St AM Improved (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (3)] Rimrock Rd & 62nd St AM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 62nd Street West															
7	L2	All MCs	664	0.0	664	0.0	0.748	14.7	LOS B	13.3	332.1	0.79	0.53	1.03	30.7
4	T1	All MCs	196	1.0	196	1.0	0.748	14.8	LOS B	13.3	332.1	0.79	0.53	1.03	29.7
14	R2	All MCs	4	0.0	4	0.0	0.748	14.7	LOS B	13.3	332.1	0.79	0.53	1.03	30.9
Approach			864	0.2	864	0.2	0.748	14.7	LOS B	13.3	332.1	0.79	0.53	1.03	30.5
West: Rimrock Road															
5	L2	All MCs	4	0.0	4	0.0	0.478	13.1	LOS B	2.3	60.0	0.74	0.78	1.02	32.3
2	T1	All MCs	272	3.0	272	3.0	0.478	14.1	LOS B	2.3	60.0	0.74	0.78	1.02	34.2
12	R2	All MCs	178	1.0	178	1.0	0.168	4.9	LOS A	0.8	19.5	0.41	0.26	0.41	37.9
Approach			454	2.2	454	2.2	0.478	10.5	LOS B	2.3	60.0	0.61	0.57	0.78	35.5
South: 62nd Street West															
3	L2	All MCs	34	12.0	34	12.0	0.303	13.9	LOS B	1.1	29.0	0.71	0.73	0.82	30.9
8	T1	All MCs	48	17.0	48	17.0	0.303	15.5	LOS C	1.1	29.0	0.71	0.73	0.82	29.5
18	R2	All MCs	48	4.0	48	4.0	0.303	11.5	LOS B	1.1	29.0	0.71	0.73	0.82	32.0
Approach			129	10.9	129	10.9	0.303	13.5	LOS B	1.1	29.0	0.71	0.73	0.82	30.7
East: Rimrock Road															
1	L2	All MCs	48	4.0	48	4.0	0.231	4.9	LOS A	1.1	29.9	0.27	0.12	0.27	36.2
6	T1	All MCs	72	17.0	72	17.0	0.231	5.9	LOS A	1.1	29.9	0.27	0.12	0.27	37.3
16	R2	All MCs	154	0.0	154	0.0	0.231	4.7	LOS A	1.1	29.9	0.27	0.12	0.27	37.3
Approach			274	5.2	274	5.2	0.231	5.0	LOS A	1.1	29.9	0.27	0.12	0.27	37.1
All Vehicles			1722	2.3	1722	2.3	0.748	12.0	LOS B	13.3	332.1	0.66	0.49	0.83	32.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (4)] Rimrock Rd & 62nd St PM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 62nd Street West															
7	L2	All MCs	283	0.0	283	0.0	0.441	9.2	LOS A	2.7	67.3	0.65	0.51	0.71	33.4
4	T1	All MCs	107	0.0	107	0.0	0.441	9.2	LOS A	2.7	67.3	0.65	0.51	0.71	32.3
14	R2	All MCs	12	0.0	12	0.0	0.441	9.2	LOS A	2.7	67.3	0.65	0.51	0.71	33.6
Approach			401	0.0	401	0.0	0.441	9.2	LOS A	2.7	67.3	0.65	0.51	0.71	33.1
West: Rimrock Road															
5	L2	All MCs	4	0.0	4	0.0	0.147	5.1	LOS A	0.6	14.7	0.49	0.37	0.49	36.9
2	T1	All MCs	130	2.0	130	2.0	0.147	5.3	LOS A	0.6	14.7	0.49	0.37	0.49	39.5
12	R2	All MCs	68	0.0	68	0.0	0.059	3.6	LOS A	0.3	6.3	0.31	0.16	0.31	38.9
Approach			203	1.3	203	1.3	0.147	4.7	LOS A	0.6	14.7	0.43	0.30	0.43	39.3
South: 62nd Street West															
3	L2	All MCs	162	0.0	162	0.0	0.375	8.2	LOS A	2.0	48.8	0.61	0.46	0.61	34.4
8	T1	All MCs	145	0.0	145	0.0	0.375	8.2	LOS A	2.0	48.8	0.61	0.46	0.61	33.2
18	R2	All MCs	30	0.0	30	0.0	0.375	8.2	LOS A	2.0	48.8	0.61	0.46	0.61	34.6
Approach			337	0.0	337	0.0	0.375	8.2	LOS A	2.0	48.8	0.61	0.46	0.61	33.9
East: Rimrock Road															
1	L2	All MCs	60	0.0	60	0.0	0.786	18.6	LOS C	15.9	397.2	0.94	0.90	1.70	30.3
6	T1	All MCs	188	0.0	188	0.0	0.786	18.6	LOS C	15.9	397.2	0.94	0.90	1.70	32.3
16	R2	All MCs	542	0.0	542	0.0	0.786	18.6	LOS C	15.9	397.2	0.94	0.90	1.70	30.6
Approach			790	0.0	790	0.0	0.786	18.6	LOS C	15.9	397.2	0.94	0.90	1.70	31.0
All Vehicles			1732	0.2	1732	0.2	0.786	12.8	LOS B	15.9	397.2	0.75	0.65	1.11	32.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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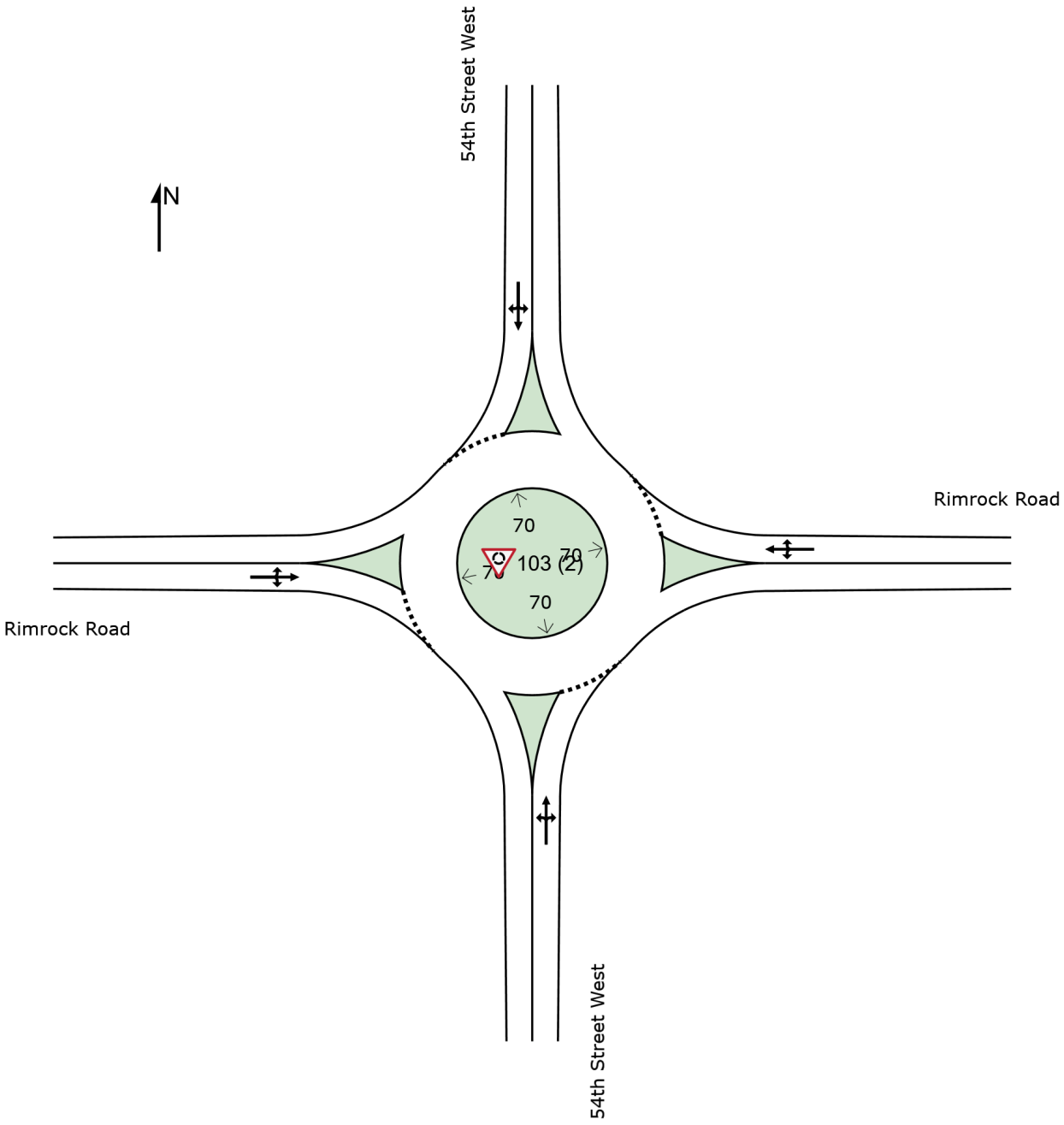
SITE LAYOUT

Site: [103 (2)] Rimrock Rd & 54th St AM Improved (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [103 (2)] Rimrock Rd & 54th St AM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 54th Street West															
7	L2	All MCs	164	3.3	164	3.3	0.311	7.7	LOS A	1.5	37.8	0.59	0.44	0.59	26.1
4	T1	All MCs	100	0.0	100	0.0	0.311	7.3	LOS A	1.5	37.8	0.59	0.44	0.59	26.8
14	R2	All MCs	5	0.0	5	0.0	0.311	7.3	LOS A	1.5	37.8	0.59	0.44	0.59	26.6
Approach			270	2.0	270	2.0	0.311	7.5	LOS A	1.5	37.8	0.59	0.44	0.59	26.4
West: Rimrock Road															
5	L2	All MCs	2	100.0	2	100.0	1.154	125.4	LOS F	63.0	1602.0	1.00	2.86	6.30	12.9
2	T1	All MCs	853	2.1	853	2.1	1.154	99.0	LOS F	63.0	1602.0	1.00	2.86	6.30	14.4
12	R2	All MCs	109	0.0	109	0.0	1.154	98.6	LOS F	63.0	1602.0	1.00	2.86	6.30	14.4
Approach			964	2.1	964	2.1	1.154	99.0	LOS F	63.0	1602.0	1.00	2.86	6.30	14.3
South: 54th Street West															
3	L2	All MCs	32	5.6	32	5.6	0.627	22.2	LOS C	3.9	98.3	0.83	0.94	1.29	27.6
8	T1	All MCs	28	0.0	28	0.0	0.627	20.3	LOS C	3.9	98.3	0.83	0.94	1.29	23.4
18	R2	All MCs	268	0.7	268	0.7	0.627	20.5	LOS C	3.9	98.3	0.83	0.94	1.29	28.4
Approach			328	1.1	328	1.1	0.627	20.6	LOS C	3.9	98.3	0.83	0.94	1.29	27.8
East: Rimrock Road															
1	L2	All MCs	190	1.9	190	1.9	0.350	5.8	LOS A	2.1	53.7	0.26	0.10	0.26	33.5
6	T1	All MCs	196	3.6	196	3.6	0.350	6.0	LOS A	2.1	53.7	0.26	0.10	0.26	33.9
16	R2	All MCs	50	10.7	50	10.7	0.350	6.5	LOS A	2.1	53.7	0.26	0.10	0.26	27.1
Approach			436	3.7	436	3.7	0.350	6.0	LOS A	2.1	53.7	0.26	0.10	0.26	32.8
All Vehicles			1998	2.3	1998	2.3	1.154	53.5	LOS F	63.0	1602.0	0.75	1.62	3.39	19.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [103 (3)] Rimrock Rd & 54th St PM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 54th Street West															
7	L2	All MCs	105	3.4	105	3.4	0.366	14.8	LOS B	1.5	38.9	0.75	0.81	0.89	24.2
4	T1	All MCs	52	0.0	52	0.0	0.366	13.5	LOS B	1.5	38.9	0.75	0.81	0.89	24.8
14	R2	All MCs	8	0.0	8	0.0	0.366	13.5	LOS B	1.5	38.9	0.75	0.81	0.89	24.6
Approach			165	2.2	165	2.2	0.366	14.3	LOS B	1.5	38.9	0.75	0.81	0.89	24.4
West: Rimrock Road															
5	L2	All MCs	3	0.0	3	0.0	0.379	8.2	LOS A	2.0	49.7	0.61	0.45	0.61	26.9
2	T1	All MCs	308	0.0	308	0.0	0.379	8.2	LOS A	2.0	49.7	0.61	0.45	0.61	34.3
12	R2	All MCs	34	0.0	34	0.0	0.379	8.2	LOS A	2.0	49.7	0.61	0.45	0.61	34.0
Approach			345	0.0	345	0.0	0.379	8.2	LOS A	2.0	49.7	0.61	0.45	0.61	34.2
South: 54th Street West															
3	L2	All MCs	128	0.0	128	0.0	0.436	9.1	LOS A	2.6	65.8	0.65	0.51	0.72	32.4
8	T1	All MCs	72	0.0	72	0.0	0.436	9.1	LOS A	2.6	65.8	0.65	0.51	0.72	26.3
18	R2	All MCs	185	2.9	185	2.9	0.436	9.5	LOS A	2.6	65.8	0.65	0.51	0.72	32.4
Approach			385	1.4	385	1.4	0.436	9.3	LOS A	2.6	65.8	0.65	0.51	0.72	31.1
East: Rimrock Road															
1	L2	All MCs	242	2.1	242	2.1	0.963	35.5	LOS E	47.4	1230.5	1.00	1.59	2.50	23.4
6	T1	All MCs	643	4.7	643	4.7	0.963	35.8	LOS E	47.4	1230.5	1.00	1.59	2.50	23.6
16	R2	All MCs	139	10.0	139	10.0	0.963	36.5	LOS E	47.4	1230.5	1.00	1.59	2.50	20.1
Approach			1025	4.8	1025	4.8	0.963	35.8	LOS E	47.4	1230.5	1.00	1.59	2.50	23.0
All Vehicles			1920	3.0	1920	3.0	0.963	23.7	LOS C	47.4	1230.5	0.84	1.10	1.67	26.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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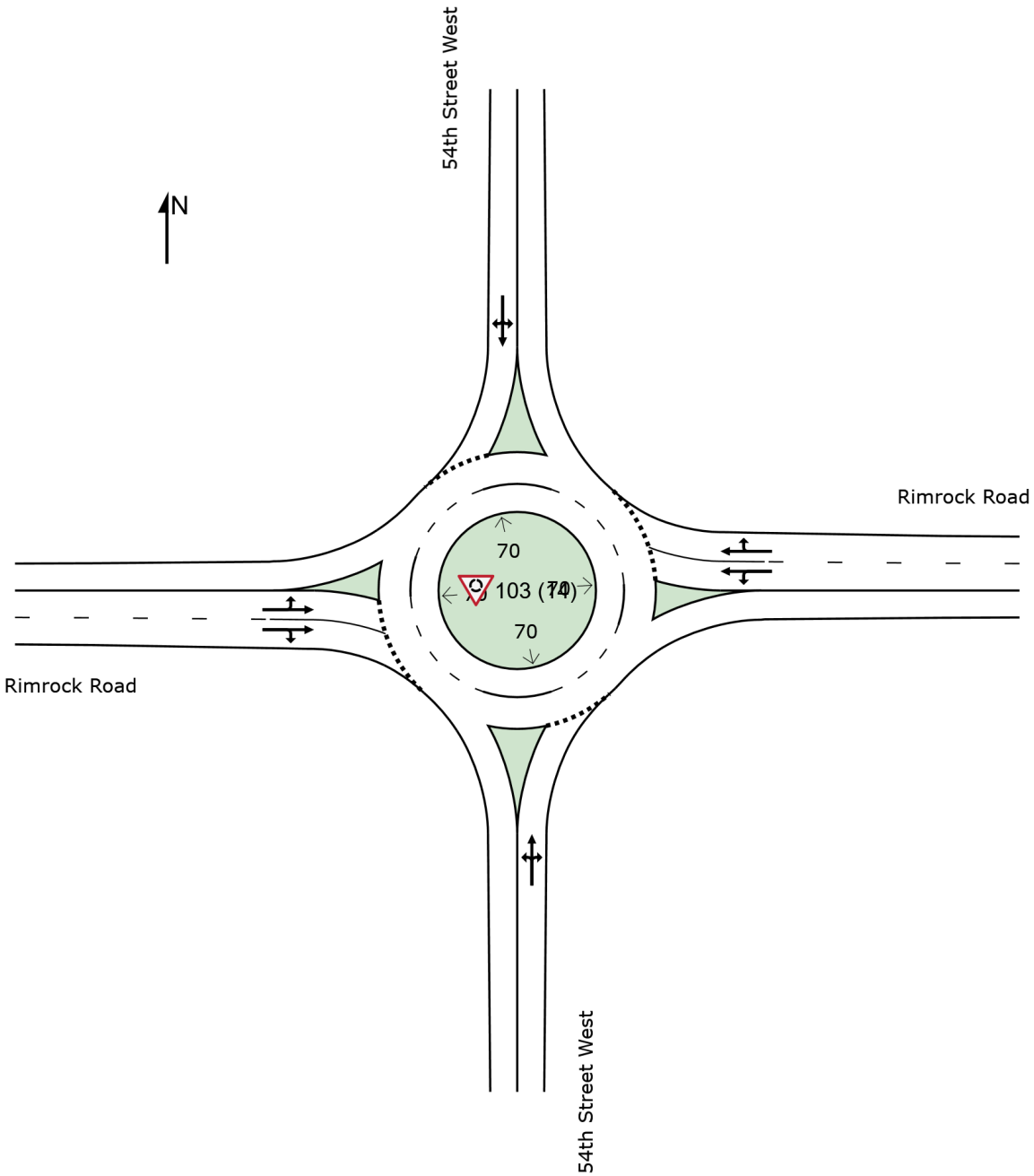
SITE LAYOUT

Site: [103 (14)] Rimrock Rd & 54th St AM Improved 2LN (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [103 (14)] Rimrock Rd & 54th St AM Improved 2LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 54th Street West															
7	L2	All MCs	164	3.3	164	3.3	0.283	6.8	LOS A	1.2	30.0	0.51	0.38	0.51	26.4
4	T1	All MCs	100	0.0	100	0.0	0.283	6.3	LOS A	1.2	30.0	0.51	0.38	0.51	27.1
14	R2	All MCs	5	0.0	5	0.0	0.283	6.3	LOS A	1.2	30.0	0.51	0.38	0.51	26.9
Approach			270	2.0	270	2.0	0.283	6.6	LOS A	1.2	30.0	0.51	0.38	0.51	26.6
West: Rimrock Road															
5	L2	All MCs	2	100.0	2	100.0	0.874	56.8	LOS F	18.9	482.7	1.00	1.32	2.48	21.7
2	T1	All MCs	853	2.1	853	2.1	0.874	26.1	LOS D	18.9	482.7	0.97	1.26	2.36	26.8
12	R2	All MCs	109	0.0	109	0.0	0.182	5.8	LOS A	0.7	18.2	0.50	0.39	0.50	35.1
Approach			964	2.1	964	2.1	0.874	23.9	LOS C	18.9	482.7	0.92	1.17	2.15	27.5
South: 54th Street West															
3	L2	All MCs	32	5.6	32	5.6	0.581	19.7	LOS C	3.1	79.3	0.77	0.89	1.20	28.7
8	T1	All MCs	28	0.0	28	0.0	0.581	17.1	LOS C	3.1	79.3	0.77	0.89	1.20	24.2
18	R2	All MCs	268	0.7	268	0.7	0.581	17.4	LOS C	3.1	79.3	0.77	0.89	1.20	29.6
Approach			328	1.1	328	1.1	0.581	17.6	LOS C	3.1	79.3	0.77	0.89	1.20	28.9
East: Rimrock Road															
1	L2	All MCs	190	1.9	190	1.9	0.281	5.0	LOS A	1.3	34.1	0.20	0.07	0.20	33.8
6	T1	All MCs	196	3.6	196	3.6	0.281	5.0	LOS A	1.3	34.1	0.20	0.07	0.20	34.4
16	R2	All MCs	50	10.7	50	10.7	0.059	3.6	LOS A	0.2	5.6	0.16	0.06	0.16	28.5
Approach			436	3.7	436	3.7	0.281	4.8	LOS A	1.3	34.1	0.19	0.07	0.19	33.3
All Vehicles			1998	2.3	1998	2.3	0.874	16.4	LOS C	18.9	482.7	0.68	0.78	1.35	28.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [103 (15)] Rimrock Rd & 54th St PM Improved 2LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 54th Street West															
7	L2	All MCs	105	3.4	105	3.4	0.302	11.4	LOS B	1.1	28.2	0.67	0.71	0.75	25.1
4	T1	All MCs	52	0.0	52	0.0	0.302	10.0	LOS B	1.1	28.2	0.67	0.71	0.75	25.7
14	R2	All MCs	8	0.0	8	0.0	0.302	10.0	LOS B	1.1	28.2	0.67	0.71	0.75	25.6
Approach			165	2.2	165	2.2	0.302	10.9	LOS B	1.1	28.2	0.67	0.71	0.75	25.3
West: Rimrock Road															
5	L2	All MCs	3	0.0	3	0.0	0.288	6.4	LOS A	1.3	31.4	0.50	0.37	0.50	27.4
2	T1	All MCs	308	0.0	308	0.0	0.288	6.3	LOS A	1.3	31.4	0.49	0.37	0.49	35.3
12	R2	All MCs	34	0.0	34	0.0	0.060	4.4	LOS A	0.2	5.6	0.44	0.33	0.44	36.0
Approach			345	0.0	345	0.0	0.288	6.1	LOS A	1.3	31.4	0.49	0.36	0.49	35.3
South: 54th Street West															
3	L2	All MCs	128	0.0	128	0.0	0.396	7.8	LOS A	1.9	47.0	0.56	0.42	0.56	33.0
8	T1	All MCs	72	0.0	72	0.0	0.396	7.8	LOS A	1.9	47.0	0.56	0.42	0.56	26.7
18	R2	All MCs	185	2.9	185	2.9	0.396	8.3	LOS A	1.9	47.0	0.56	0.42	0.56	33.0
Approach			385	1.4	385	1.4	0.396	8.0	LOS A	1.9	47.0	0.56	0.42	0.56	31.6
East: Rimrock Road															
1	L2	All MCs	242	2.1	242	2.1	0.760	15.3	LOS C	14.5	374.8	0.77	0.65	1.19	29.6
6	T1	All MCs	643	4.7	643	4.7	0.760	15.3	LOS C	14.5	374.8	0.75	0.63	1.16	30.0
16	R2	All MCs	139	10.0	139	10.0	0.158	5.0	LOS A	0.6	16.1	0.34	0.20	0.34	28.0
Approach			1025	4.8	1025	4.8	0.760	13.9	LOS B	14.5	374.8	0.70	0.58	1.06	29.6
All Vehicles			1920	3.0	1920	3.0	0.760	11.1	LOS B	14.5	374.8	0.63	0.52	0.83	30.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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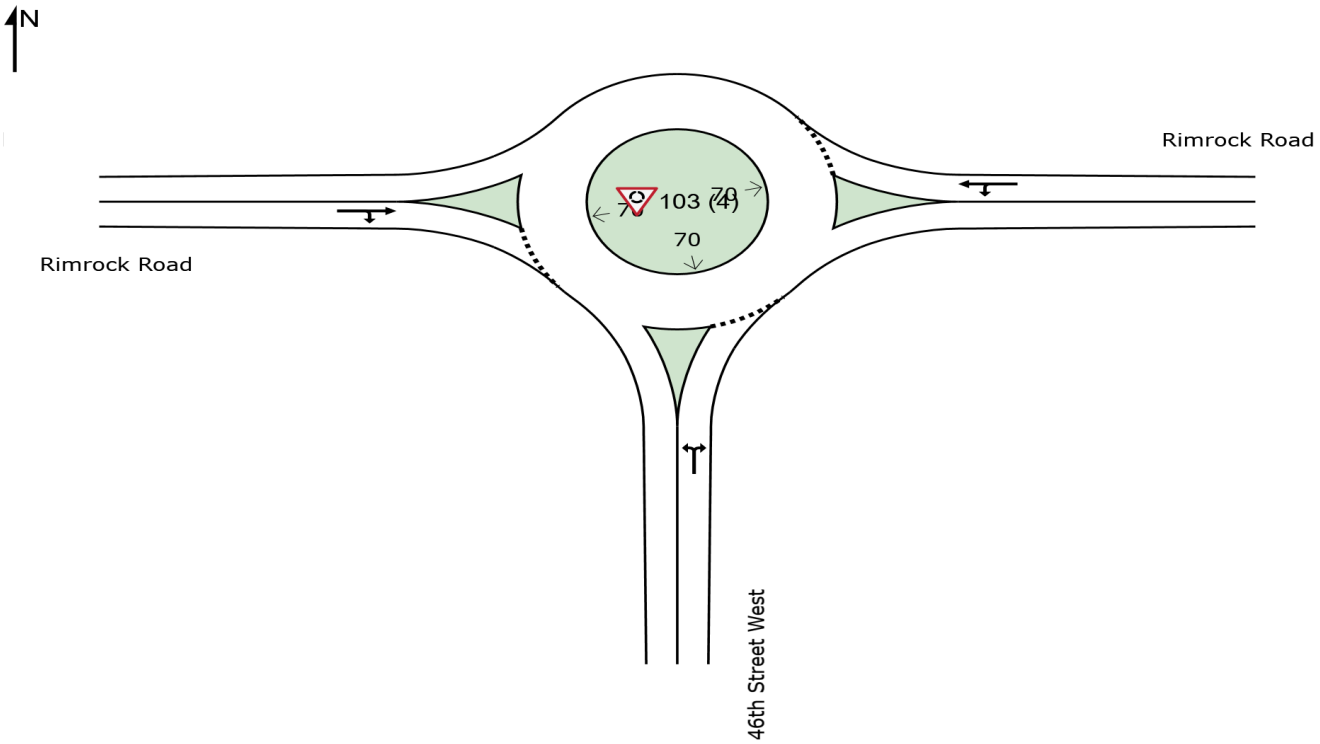
SITE LAYOUT

Site: [103 (4)] Rimrock Rd & 46th St AM Improved (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: [103 (4)] Rimrock Rd & 46th St AM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
West: Rimrock Road															
2	T1	All MCs	1291	1.7	1291	1.7	1.037	27.3	LOS F	146.5	3714.5	1.00	1.16	1.30	26.4
12	R2	All MCs	66	2.7	66	2.7	1.037	27.4	LOS F	146.5	3714.5	1.00	1.16	1.30	22.0
Approach			1358	1.7	1358	1.7	1.037	27.3	LOS D	146.5	3714.5	1.00	1.16	1.30	26.2
South: 46th Street West															
3	L2	All MCs	14	0.0	14	0.0	0.239	13.2	LOS B	0.8	21.3	0.78	0.78	0.79	24.9
18	R2	All MCs	72	2.5	72	2.5	0.239	14.5	LOS B	0.8	21.3	0.78	0.78	0.79	24.9
Approach			86	2.1	86	2.1	0.239	14.3	LOS B	0.8	21.3	0.78	0.78	0.79	24.9
East: Rimrock Road															
1	L2	All MCs	36	0.0	36	0.0	0.364	5.1	LOS A	2.3	59.2	0.11	0.02	0.11	27.7
6	T1	All MCs	446	3.2	446	3.2	0.364	5.3	LOS A	2.3	59.2	0.11	0.02	0.11	35.2
Approach			482	3.0	482	3.0	0.364	5.3	LOS A	2.3	59.2	0.11	0.02	0.11	34.5
All Vehicles			1925	2.1	1925	2.1	1.037	21.2	LOS C	146.5	3714.5	0.77	0.86	0.98	27.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [103 (5)] Rimrock Rd & 46th St PM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
West: Rimrock Road															
2	T1	All MCs	579	1.2	579	1.2	0.485	7.7	LOS A	3.6	90.4	0.36	0.15	0.36	34.4
12	R2	All MCs	28	0.0	28	0.0	0.485	7.6	LOS A	3.6	90.4	0.36	0.15	0.36	27.2
Approach			608	1.1	608	1.1	0.485	7.7	LOS A	3.6	90.4	0.36	0.15	0.36	34.0
South: 46th Street West															
3	L2	All MCs	25	0.0	25	0.0	0.081	5.3	LOS A	0.3	7.9	0.56	0.47	0.56	27.1
18	R2	All MCs	34	5.3	34	5.3	0.081	6.2	LOS A	0.3	7.9	0.56	0.47	0.56	26.9
Approach			59	3.0	59	3.0	0.081	5.8	LOS A	0.3	7.9	0.56	0.47	0.56	27.0
East: Rimrock Road															
1	L2	All MCs	84	0.0	84	0.0	0.868	13.1	LOS B	23.6	591.9	0.64	0.16	0.64	25.3
6	T1	All MCs	1083	0.2	1083	0.2	0.868	13.1	LOS B	23.6	591.9	0.64	0.16	0.64	31.7
Approach			1166	0.2	1166	0.2	0.868	13.1	LOS B	23.6	591.9	0.64	0.16	0.64	31.2
All Vehicles			1833	0.6	1833	0.6	0.868	11.1	LOS B	23.6	591.9	0.54	0.17	0.54	31.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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SITE LAYOUT

Site: [103 (12)] Rimrock Rd & 46th St AM Improved EB RT Slip

(Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

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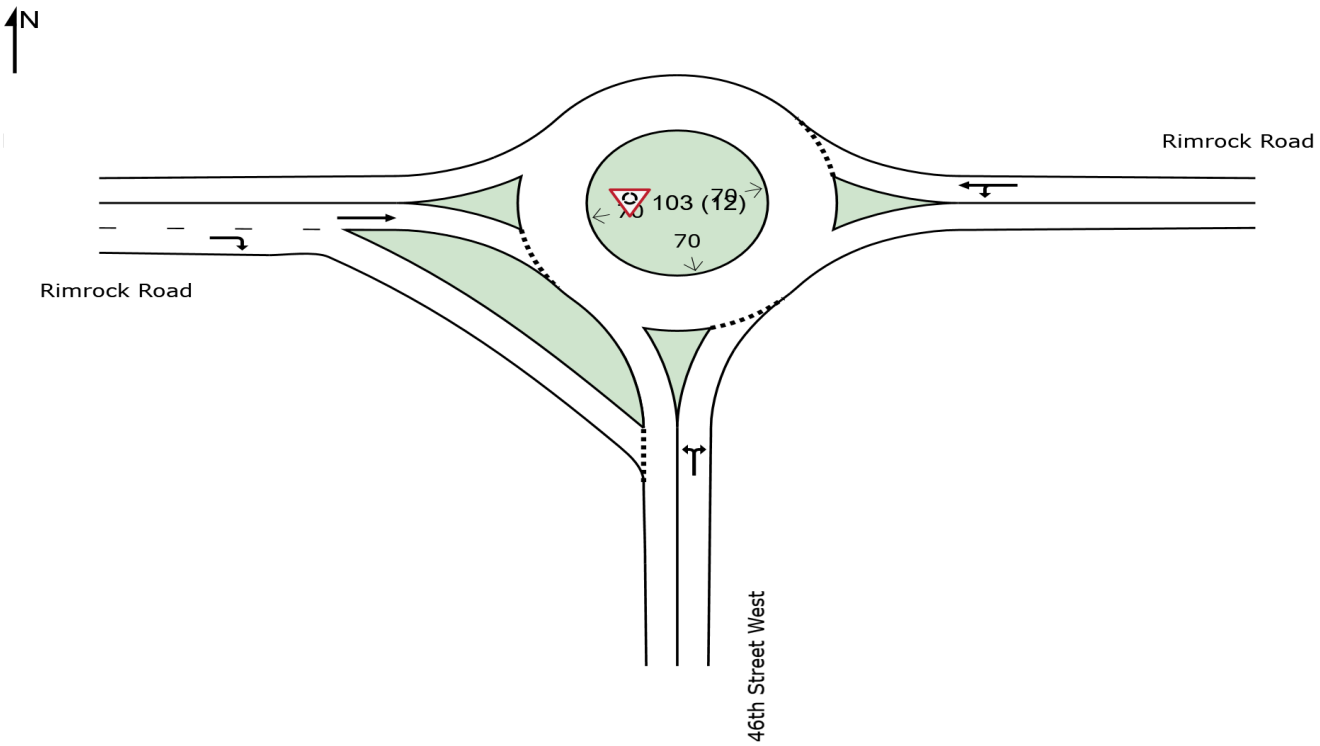

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Project: P:\23379_Yellowstone_County_West_Billings_Neighborhood_Plan\TRAFFIC\Capacity Calcs\Future 2044\Roundabouts\West Billings RABs Future (2044) Improved.sipx

MOVEMENT SUMMARY

Site: [103 (12)] Rimrock Rd & 46th St AM Improved EB RT Slip

(Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
West: Rimrock Road															
2	T1	All MCs	1291	1.7	1291	1.7	0.956	19.3	LOS C	50.3	1274.7	1.00	0.44	1.02	29.2
12	R2	All MCs	66	2.7	66	2.7	0.051	3.1	LOS A	0.2	5.6	0.13	0.04	0.13	28.8
Approach			1358	1.7	1358	1.7	0.956	18.5	LOS C	50.3	1274.7	0.96	0.42	0.98	29.2
South: 46th Street West															
3	L2	All MCs	14	0.0	14	0.0	0.251	14.0	LOS B	0.9	22.3	0.79	0.80	0.82	24.6
18	R2	All MCs	72	2.5	72	2.5	0.251	15.5	LOS C	0.9	22.3	0.79	0.80	0.82	24.6
Approach			86	2.1	86	2.1	0.251	15.2	LOS C	0.9	22.3	0.79	0.80	0.82	24.6
East: Rimrock Road															
1	L2	All MCs	36	0.0	36	0.0	0.364	5.1	LOS A	2.3	59.2	0.11	0.02	0.11	27.7
6	T1	All MCs	446	3.2	446	3.2	0.364	5.3	LOS A	2.3	59.2	0.11	0.02	0.11	35.2
Approach			482	3.0	482	3.0	0.364	5.3	LOS A	2.3	59.2	0.11	0.02	0.11	34.5
All Vehicles			1925	2.1	1925	2.1	0.956	15.0	LOS C	50.3	1274.7	0.74	0.34	0.75	30.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [103 (13)] Rimrock Rd & 46th St PM Improved EB RT Slip

(Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
West: Rimrock Road															
2	T1	All MCs	579	1.2	579	1.2	0.446	7.0	LOS A	2.9	72.4	0.31	0.12	0.31	34.8
12	R2	All MCs	28	0.0	28	0.0	0.022	3.0	LOS A	0.1	2.4	0.20	0.08	0.20	28.8
Approach			608	1.1	608	1.1	0.446	6.8	LOS A	2.9	72.4	0.30	0.12	0.30	34.5
South: 46th Street West															
3	L2	All MCs	25	0.0	25	0.0	0.081	5.3	LOS A	0.3	7.9	0.56	0.47	0.56	27.1
18	R2	All MCs	34	5.3	34	5.3	0.081	6.2	LOS A	0.3	7.9	0.56	0.47	0.56	26.9
Approach			59	3.0	59	3.0	0.081	5.8	LOS A	0.3	7.9	0.56	0.47	0.56	27.0
East: Rimrock Road															
1	L2	All MCs	84	0.0	84	0.0	0.868	13.1	LOS B	23.6	591.9	0.64	0.16	0.64	25.3
6	T1	All MCs	1083	0.2	1083	0.2	0.868	13.1	LOS B	23.6	591.9	0.64	0.16	0.64	31.7
Approach			1166	0.2	1166	0.2	0.868	13.1	LOS B	23.6	591.9	0.64	0.16	0.64	31.2
All Vehicles			1833	0.6	1833	0.6	0.868	10.8	LOS B	23.6	591.9	0.52	0.16	0.52	32.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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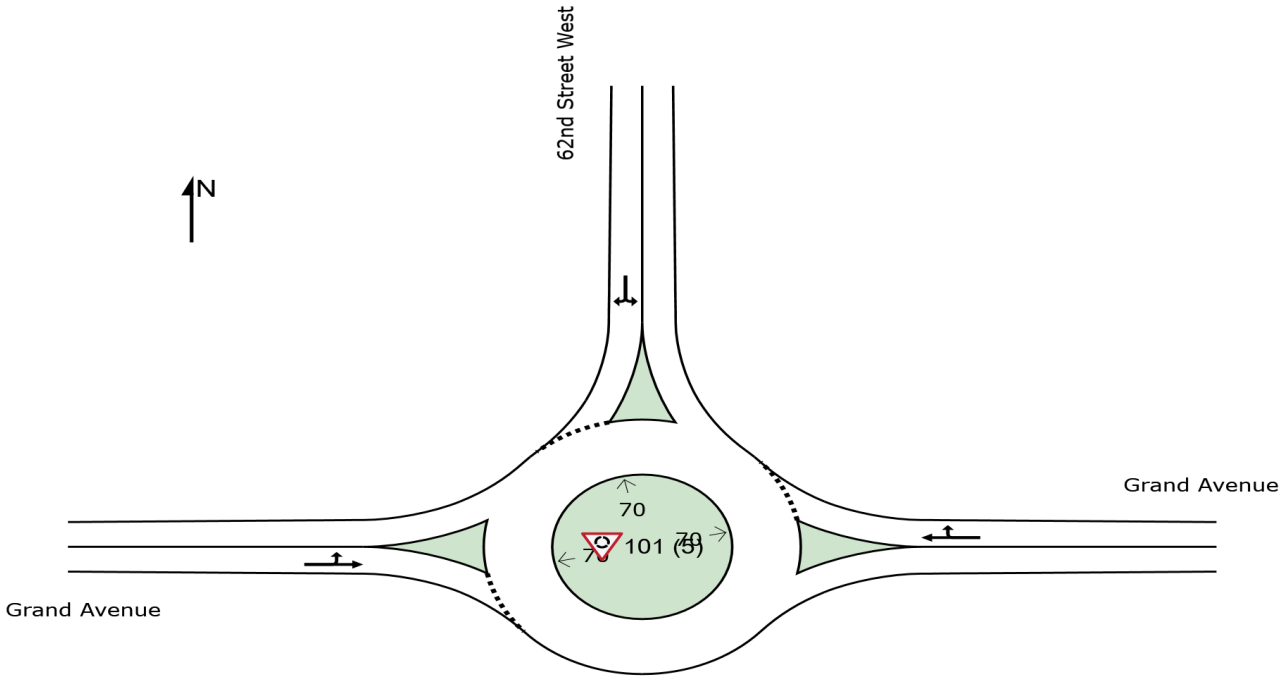
SITE LAYOUT

Site: [101 (5)] Grand Ave & 62nd St AM Improved (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: P:\23379_Yellowstone_County_West_Billings_Neighborhood_Plan\TRAFFIC\Capacity Calcs\Future 2044\Roundabouts\West Billings RABs Future (2044) Improved.sipx

MOVEMENT SUMMARY

Site: [101 (5)] Grand Ave & 62nd St AM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 62nd Street West															
7	L2	All MCs	288	1.2	288	1.2	0.331	6.3	LOS A	1.9	46.7	0.41	0.22	0.41	32.8
14	R2	All MCs	91	0.0	91	0.0	0.331	6.2	LOS A	1.9	46.7	0.41	0.22	0.41	33.3
Approach			379	0.9	379	0.9	0.331	6.3	LOS A	1.9	46.7	0.41	0.22	0.41	32.9
West: Grand Avenue															
5	L2	All MCs	55	0.0	55	0.0	0.333	6.8	LOS A	1.8	44.2	0.52	0.34	0.52	33.9
2	T1	All MCs	282	1.3	282	1.3	0.333	7.0	LOS A	1.8	44.2	0.52	0.34	0.52	34.4
Approach			337	1.1	337	1.1	0.333	6.9	LOS A	1.8	44.2	0.52	0.34	0.52	34.3
East: Grand Avenue															
6	T1	All MCs	162	6.6	162	6.6	0.182	4.4	LOS A	0.9	22.7	0.19	0.07	0.19	35.5
16	R2	All MCs	59	12.1	59	12.1	0.182	4.7	LOS A	0.9	22.7	0.19	0.07	0.19	34.3
Approach			221	8.1	221	8.1	0.182	4.4	LOS A	0.9	22.7	0.19	0.07	0.19	35.1
All Vehicles			937	2.7	937	2.7	0.333	6.1	LOS A	1.9	46.7	0.40	0.23	0.40	33.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [101 (6)] Grand Ave & 62nd St PM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 62nd Street West															
7	L2	All MCs	84	0.0	84	0.0	0.160	5.2	LOS A	0.7	18.0	0.47	0.33	0.47	34.0
14	R2	All MCs	73	0.0	73	0.0	0.160	5.2	LOS A	0.7	18.0	0.47	0.33	0.47	34.4
Approach			157	0.0	157	0.0	0.160	5.2	LOS A	0.7	18.0	0.47	0.33	0.47	34.2
West: Grand Avenue															
5	L2	All MCs	98	0.0	98	0.0	0.285	5.2	LOS A	1.6	39.9	0.27	0.11	0.27	34.5
2	T1	All MCs	260	1.4	260	1.4	0.285	5.3	LOS A	1.6	39.9	0.27	0.11	0.27	35.0
Approach			358	1.0	358	1.0	0.285	5.3	LOS A	1.6	39.9	0.27	0.11	0.27	34.8
East: Grand Avenue															
6	T1	All MCs	338	0.0	338	0.0	0.438	7.1	LOS A	3.0	75.0	0.36	0.16	0.36	34.9
16	R2	All MCs	209	0.0	209	0.0	0.438	7.1	LOS A	3.0	75.0	0.36	0.16	0.36	34.7
Approach			547	0.0	547	0.0	0.438	7.1	LOS A	3.0	75.0	0.36	0.16	0.36	34.8
All Vehicles			1061	0.3	1061	0.3	0.438	6.2	LOS A	3.0	75.0	0.34	0.17	0.34	34.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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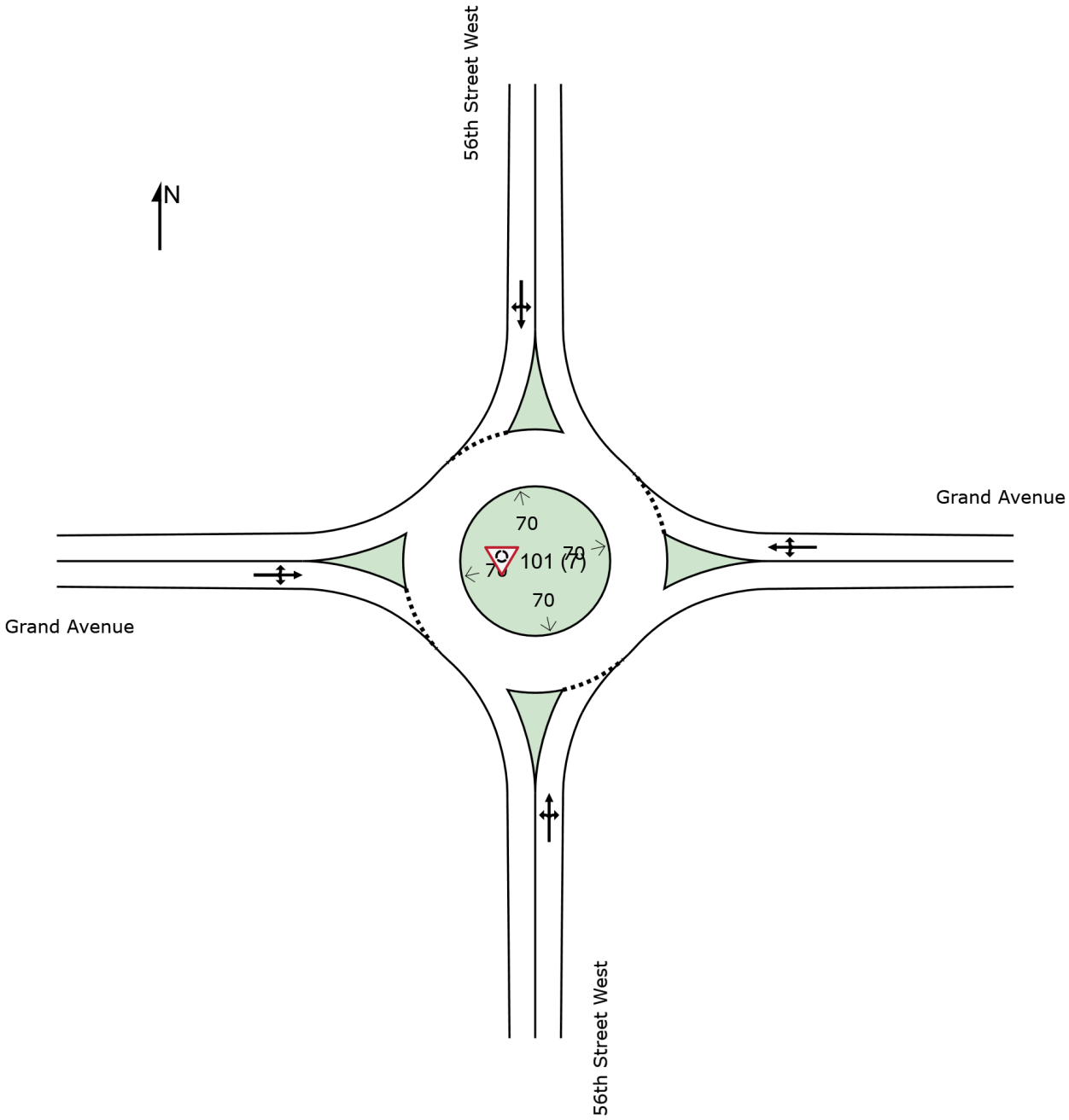
SITE LAYOUT

Site: [101 (7)] Grand Ave & 56th St AM Improved 1LN (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (7)] Grand Ave & 56th St AM Improved 1LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	1	0.0	1	0.0	0.005	5.5	LOS A	0.0	0.5	0.58	0.41	0.58	29.3
4	T1	All MCs	1	0.0	1	0.0	0.005	5.5	LOS A	0.0	0.5	0.58	0.41	0.58	29.7
14	R2	All MCs	1	0.0	1	0.0	0.005	5.5	LOS A	0.0	0.5	0.58	0.41	0.58	29.5
Approach			3	0.0	3	0.0	0.005	5.5	LOS A	0.0	0.5	0.58	0.41	0.58	29.5
West: Grand Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.962	33.3	LOS D	51.7	1308.5	1.00	1.62	2.26	21.8
2	T1	All MCs	855	1.0	855	1.0	0.962	33.4	LOS D	51.7	1308.5	1.00	1.62	2.26	22.0
12	R2	All MCs	239	3.7	239	3.7	0.962	33.8	LOS D	51.7	1308.5	1.00	1.62	2.26	21.9
Approach			1096	1.6	1096	1.6	0.962	33.5	LOS D	51.7	1308.5	1.00	1.62	2.26	22.0
South: 56th Street West															
3	L2	All MCs	50	10.7	50	10.7	0.471	16.6	LOS C	2.1	57.0	0.76	0.82	1.02	25.7
8	T1	All MCs	1	0.0	1	0.0	0.471	13.7	LOS B	2.1	57.0	0.76	0.82	1.02	26.1
18	R2	All MCs	175	9.2	175	9.2	0.471	16.1	LOS C	2.1	57.0	0.76	0.82	1.02	25.9
Approach			226	9.5	226	9.5	0.471	16.2	LOS C	2.1	57.0	0.76	0.82	1.02	25.9
East: Grand Avenue															
1	L2	All MCs	157	8.0	157	8.0	0.515	8.3	LOS A	4.0	103.5	0.31	0.11	0.31	28.4
6	T1	All MCs	488	2.6	488	2.6	0.515	7.8	LOS A	4.0	103.5	0.31	0.11	0.31	28.9
16	R2	All MCs	1	0.0	1	0.0	0.515	7.6	LOS A	4.0	103.5	0.31	0.11	0.31	28.8
Approach			646	3.9	646	3.9	0.515	7.9	LOS A	4.0	103.5	0.31	0.11	0.31	28.8
All Vehicles			1971	3.3	1971	3.3	0.962	23.1	LOS C	51.7	1308.5	0.75	1.03	1.47	24.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (8)] Grand Ave & 56th St PM Improved 1LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	1	0.0	1	0.0	0.006	6.9	LOS A	0.0	0.6	0.63	0.50	0.63	28.8
4	T1	All MCs	1	0.0	1	0.0	0.006	6.9	LOS A	0.0	0.6	0.63	0.50	0.63	29.2
14	R2	All MCs	1	0.0	1	0.0	0.006	6.9	LOS A	0.0	0.6	0.63	0.50	0.63	29.0
Approach			3	0.0	3	0.0	0.006	6.9	LOS A	0.0	0.6	0.63	0.50	0.63	29.0
West: Grand Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.576	10.0	LOS B	4.4	110.7	0.60	0.34	0.60	28.1
2	T1	All MCs	535	0.7	535	0.7	0.576	10.1	LOS B	4.4	110.7	0.60	0.34	0.60	28.5
12	R2	All MCs	109	1.6	109	1.6	0.576	10.2	LOS B	4.4	110.7	0.60	0.34	0.60	28.4
Approach			645	0.9	645	0.9	0.576	10.1	LOS B	4.4	110.7	0.60	0.34	0.60	28.5
South: 56th Street West															
3	L2	All MCs	136	1.3	136	1.3	0.585	13.7	LOS B	4.8	121.4	0.78	0.80	1.19	26.4
8	T1	All MCs	1	0.0	1	0.0	0.585	13.4	LOS B	4.8	121.4	0.78	0.80	1.19	26.7
18	R2	All MCs	310	3.4	310	3.4	0.585	14.0	LOS B	4.8	121.4	0.78	0.80	1.19	26.6
Approach			447	2.8	447	2.8	0.585	13.9	LOS B	4.8	121.4	0.78	0.80	1.19	26.5
East: Grand Avenue															
1	L2	All MCs	190	1.9	190	1.9	0.672	12.0	LOS B	6.6	165.5	0.63	0.32	0.63	27.2
6	T1	All MCs	608	0.3	608	0.3	0.672	11.8	LOS B	6.6	165.5	0.63	0.32	0.63	27.6
16	R2	All MCs	1	0.0	1	0.0	0.672	11.8	LOS B	6.6	165.5	0.63	0.32	0.63	27.4
Approach			799	0.7	799	0.7	0.672	11.9	LOS B	6.6	165.5	0.63	0.32	0.63	27.5
All Vehicles			1893	1.2	1893	1.2	0.672	11.7	LOS B	6.6	165.5	0.66	0.44	0.75	27.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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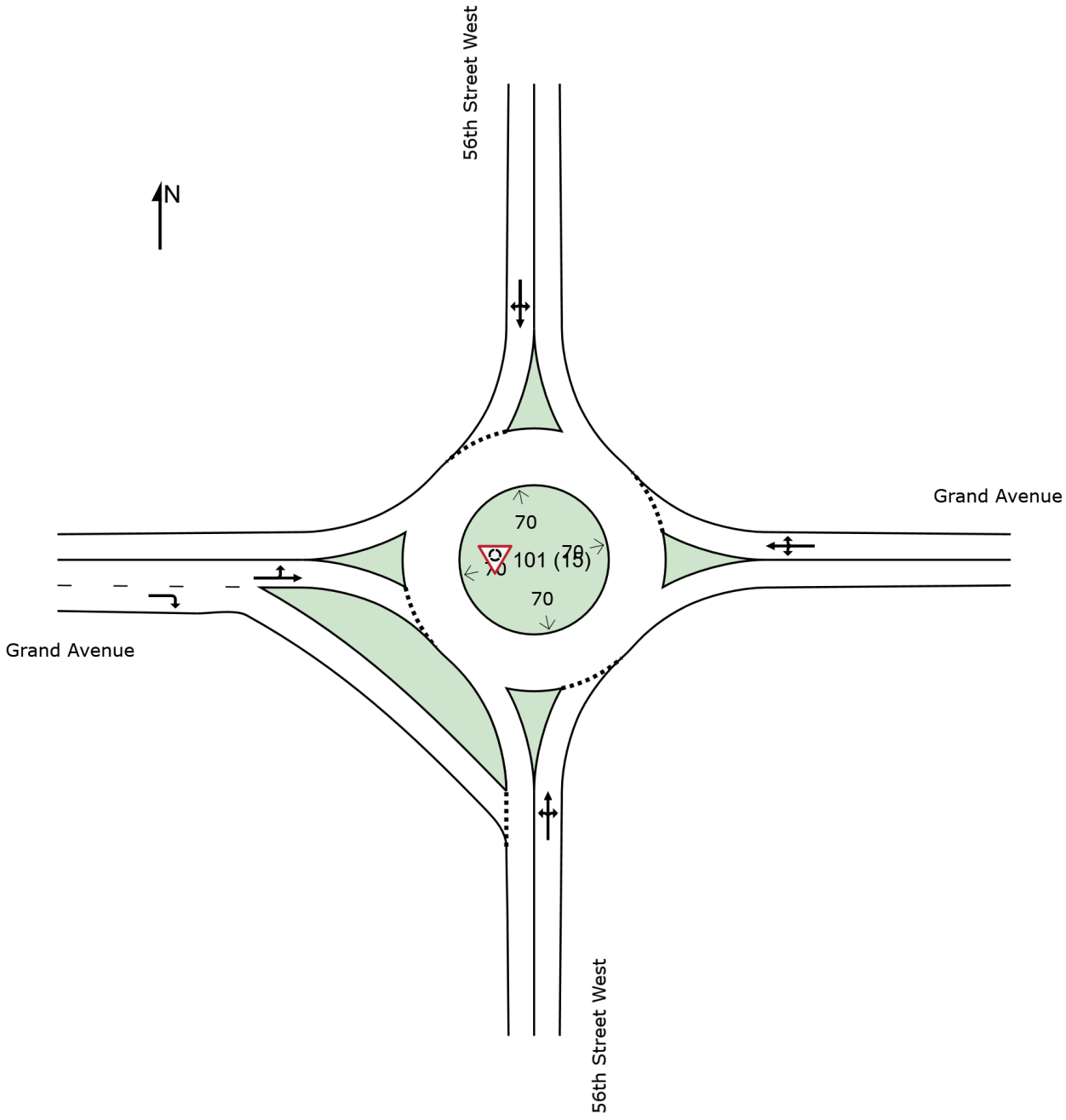
SITE LAYOUT

Site: [101 (15)] Grand Ave & 56th St AM Improved 1LN EB RT

Slip (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (15)] Grand Ave & 56th St AM Improved 1LN EB RT

Slip (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	1	0.0	1	0.0	0.005	5.5	LOS A	0.0	0.5	0.58	0.41	0.58	29.3
4	T1	All MCs	1	0.0	1	0.0	0.005	5.5	LOS A	0.0	0.5	0.58	0.41	0.58	29.7
14	R2	All MCs	1	0.0	1	0.0	0.005	5.5	LOS A	0.0	0.5	0.58	0.41	0.58	29.5
Approach			3	0.0	3	0.0	0.005	5.5	LOS A	0.0	0.5	0.58	0.41	0.58	29.5
West: Grand Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.713	13.0	LOS B	9.5	240.0	0.69	0.45	0.82	27.1
2	T1	All MCs	855	1.0	855	1.0	0.713	13.1	LOS B	9.5	240.0	0.69	0.45	0.82	27.5
12	R2	All MCs	239	3.7	239	3.7	0.214	5.1	LOS A	1.0	26.5	0.36	0.19	0.36	30.2
Approach			1096	1.6	1096	1.6	0.713	11.4	LOS B	9.5	240.0	0.62	0.40	0.72	28.1
South: 56th Street West															
3	L2	All MCs	50	10.7	50	10.7	0.471	16.6	LOS C	2.2	58.2	0.76	0.83	1.05	25.7
8	T1	All MCs	1	0.0	1	0.0	0.471	13.7	LOS B	2.2	58.2	0.76	0.83	1.05	26.1
18	R2	All MCs	175	9.2	175	9.2	0.471	16.1	LOS C	2.2	58.2	0.76	0.83	1.05	25.9
Approach			226	9.5	226	9.5	0.471	16.2	LOS C	2.2	58.2	0.76	0.83	1.05	25.9
East: Grand Avenue															
1	L2	All MCs	157	8.0	157	8.0	0.515	8.3	LOS A	4.0	103.5	0.31	0.11	0.31	28.4
6	T1	All MCs	488	2.6	488	2.6	0.515	7.8	LOS A	4.0	103.5	0.31	0.11	0.31	28.9
16	R2	All MCs	1	0.0	1	0.0	0.515	7.6	LOS A	4.0	103.5	0.31	0.11	0.31	28.8
Approach			646	3.9	646	3.9	0.515	7.9	LOS A	4.0	103.5	0.31	0.11	0.31	28.8
All Vehicles			1971	3.3	1971	3.3	0.713	10.8	LOS B	9.5	240.0	0.53	0.35	0.62	28.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (16)] Grand Ave & 56th St PM Improved 1LN EB RT

Slip (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	1	0.0	1	0.0	0.006	6.9	LOS A	0.0	0.6	0.63	0.50	0.63	28.8
4	T1	All MCs	1	0.0	1	0.0	0.006	6.9	LOS A	0.0	0.6	0.63	0.50	0.63	29.2
14	R2	All MCs	1	0.0	1	0.0	0.006	6.9	LOS A	0.0	0.6	0.63	0.50	0.63	29.0
Approach			3	0.0	3	0.0	0.006	6.9	LOS A	0.0	0.6	0.63	0.50	0.63	29.0
West: Grand Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.455	7.7	LOS A	2.7	69.1	0.47	0.26	0.47	29.0
2	T1	All MCs	535	0.7	535	0.7	0.455	7.7	LOS A	2.7	69.1	0.47	0.26	0.47	29.4
12	R2	All MCs	109	1.6	109	1.6	0.098	4.1	LOS A	0.4	10.8	0.34	0.20	0.34	30.7
Approach			645	0.9	645	0.9	0.455	7.1	LOS A	2.7	69.1	0.45	0.25	0.45	29.6
South: 56th Street West															
3	L2	All MCs	136	1.3	136	1.3	0.585	13.7	LOS B	4.8	122.2	0.78	0.81	1.19	26.4
8	T1	All MCs	1	0.0	1	0.0	0.585	13.4	LOS B	4.8	122.2	0.78	0.81	1.19	26.7
18	R2	All MCs	310	3.4	310	3.4	0.585	14.0	LOS B	4.8	122.2	0.78	0.81	1.19	26.6
Approach			447	2.8	447	2.8	0.585	13.9	LOS B	4.8	122.2	0.78	0.81	1.19	26.5
East: Grand Avenue															
1	L2	All MCs	190	1.9	190	1.9	0.672	12.0	LOS B	6.6	165.5	0.63	0.32	0.63	27.2
6	T1	All MCs	608	0.3	608	0.3	0.672	11.8	LOS B	6.6	165.5	0.63	0.32	0.63	27.6
16	R2	All MCs	1	0.0	1	0.0	0.672	11.8	LOS B	6.6	165.5	0.63	0.32	0.63	27.4
Approach			799	0.7	799	0.7	0.672	11.9	LOS B	6.6	165.5	0.63	0.32	0.63	27.5
All Vehicles			1893	1.2	1893	1.2	0.672	10.7	LOS B	6.6	165.5	0.60	0.41	0.70	27.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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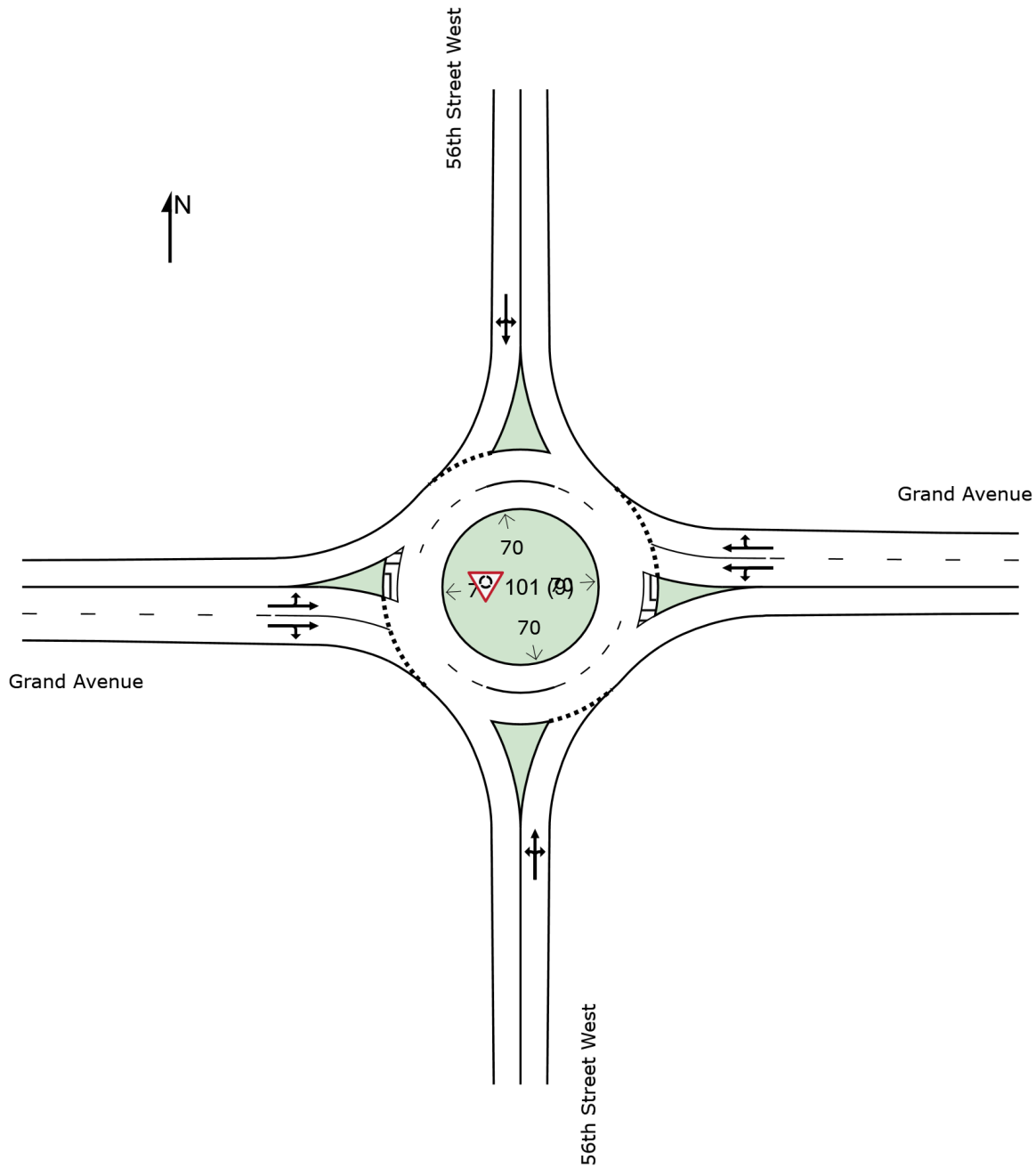
SITE LAYOUT

Site: [101 (9)] Grand Ave & 56th St AM Improved 2LN (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (9)] Grand Ave & 56th St AM Improved 2LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	1	0.0	1	0.0	0.004	4.7	LOS A	0.0	0.4	0.52	0.36	0.52	29.6
4	T1	All MCs	1	0.0	1	0.0	0.004	4.7	LOS A	0.0	0.4	0.52	0.36	0.52	30.0
14	R2	All MCs	1	0.0	1	0.0	0.004	4.7	LOS A	0.0	0.4	0.52	0.36	0.52	29.8
Approach			3	0.0	3	0.0	0.004	4.7	LOS A	0.0	0.4	0.52	0.36	0.52	29.8
West: Grand Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.713	13.0	LOS B	9.5	240.2	0.69	0.45	0.82	27.1
2	T1	All MCs	855	1.0	855	1.0	0.713	13.1	LOS B	9.5	240.2	0.69	0.45	0.82	27.5
12	R2	All MCs	239	3.7	239	3.7	0.205	4.9	LOS A	0.9	23.3	0.33	0.18	0.33	30.1
Approach			1096	1.6	1096	1.6	0.713	11.3	LOS B	9.5	240.2	0.61	0.39	0.71	28.0
South: 56th Street West															
3	L2	All MCs	50	10.7	50	10.7	0.413	13.5	LOS B	1.6	43.5	0.69	0.73	0.91	26.6
8	T1	All MCs	1	0.0	1	0.0	0.413	10.4	LOS B	1.6	43.5	0.69	0.73	0.91	27.1
18	R2	All MCs	175	9.2	175	9.2	0.413	13.0	LOS B	1.6	43.5	0.69	0.73	0.91	26.9
Approach			226	9.5	226	9.5	0.413	13.1	LOS B	1.6	43.5	0.69	0.73	0.91	26.8
East: Grand Avenue															
1	L2	All MCs	157	8.0	157	8.0	0.413	6.8	LOS A	2.5	64.3	0.24	0.08	0.24	28.9
6	T1	All MCs	488	2.6	488	2.6	0.413	5.7	LOS A	2.5	64.3	0.22	0.08	0.22	29.8
16	R2	All MCs	1	0.0	1	0.0	0.086	3.2	LOS A	0.3	8.9	0.16	0.06	0.16	30.9
Approach			646	3.9	646	3.9	0.413	5.9	LOS A	2.5	64.3	0.22	0.08	0.22	29.6
All Vehicles			1971	3.3	1971	3.3	0.713	9.7	LOS A	9.5	240.2	0.49	0.33	0.57	28.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (10)] Grand Ave & 56th St PM Improved 2LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 56th Street West															
7	L2	All MCs	1	0.0	1	0.0	0.005	5.7	LOS A	0.0	0.4	0.57	0.44	0.57	29.2
4	T1	All MCs	1	0.0	1	0.0	0.005	5.7	LOS A	0.0	0.4	0.57	0.44	0.57	29.6
14	R2	All MCs	1	0.0	1	0.0	0.005	5.7	LOS A	0.0	0.4	0.57	0.44	0.57	29.5
Approach			3	0.0	3	0.0	0.005	5.7	LOS A	0.0	0.4	0.57	0.44	0.57	29.4
West: Grand Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.454	7.6	LOS A	2.7	68.8	0.47	0.26	0.47	29.0
2	T1	All MCs	535	0.7	535	0.7	0.454	7.7	LOS A	2.7	68.8	0.47	0.26	0.47	29.4
12	R2	All MCs	109	1.6	109	1.6	0.095	3.9	LOS A	0.4	9.6	0.31	0.18	0.31	30.6
Approach			645	0.9	645	0.9	0.454	7.1	LOS A	2.7	68.8	0.44	0.25	0.44	29.6
South: 56th Street West															
3	L2	All MCs	136	1.3	136	1.3	0.523	11.0	LOS B	3.5	90.5	0.68	0.67	0.98	27.2
8	T1	All MCs	1	0.0	1	0.0	0.523	10.7	LOS B	3.5	90.5	0.68	0.67	0.98	27.6
18	R2	All MCs	310	3.4	310	3.4	0.523	11.4	LOS B	3.5	90.5	0.68	0.67	0.98	27.4
Approach			447	2.8	447	2.8	0.523	11.3	LOS B	3.5	90.5	0.68	0.67	0.98	27.4
East: Grand Avenue															
1	L2	All MCs	190	1.9	190	1.9	0.533	8.7	LOS A	3.8	95.0	0.45	0.23	0.45	28.2
6	T1	All MCs	608	0.3	608	0.3	0.533	7.5	LOS A	3.8	95.0	0.41	0.20	0.41	29.1
16	R2	All MCs	1	0.0	1	0.0	0.111	3.8	LOS A	0.5	11.7	0.27	0.13	0.27	30.8
Approach			799	0.7	799	0.7	0.533	7.8	LOS A	3.8	95.0	0.42	0.21	0.42	28.9
All Vehicles			1893	1.2	1893	1.2	0.533	8.3	LOS A	3.8	95.0	0.49	0.33	0.56	28.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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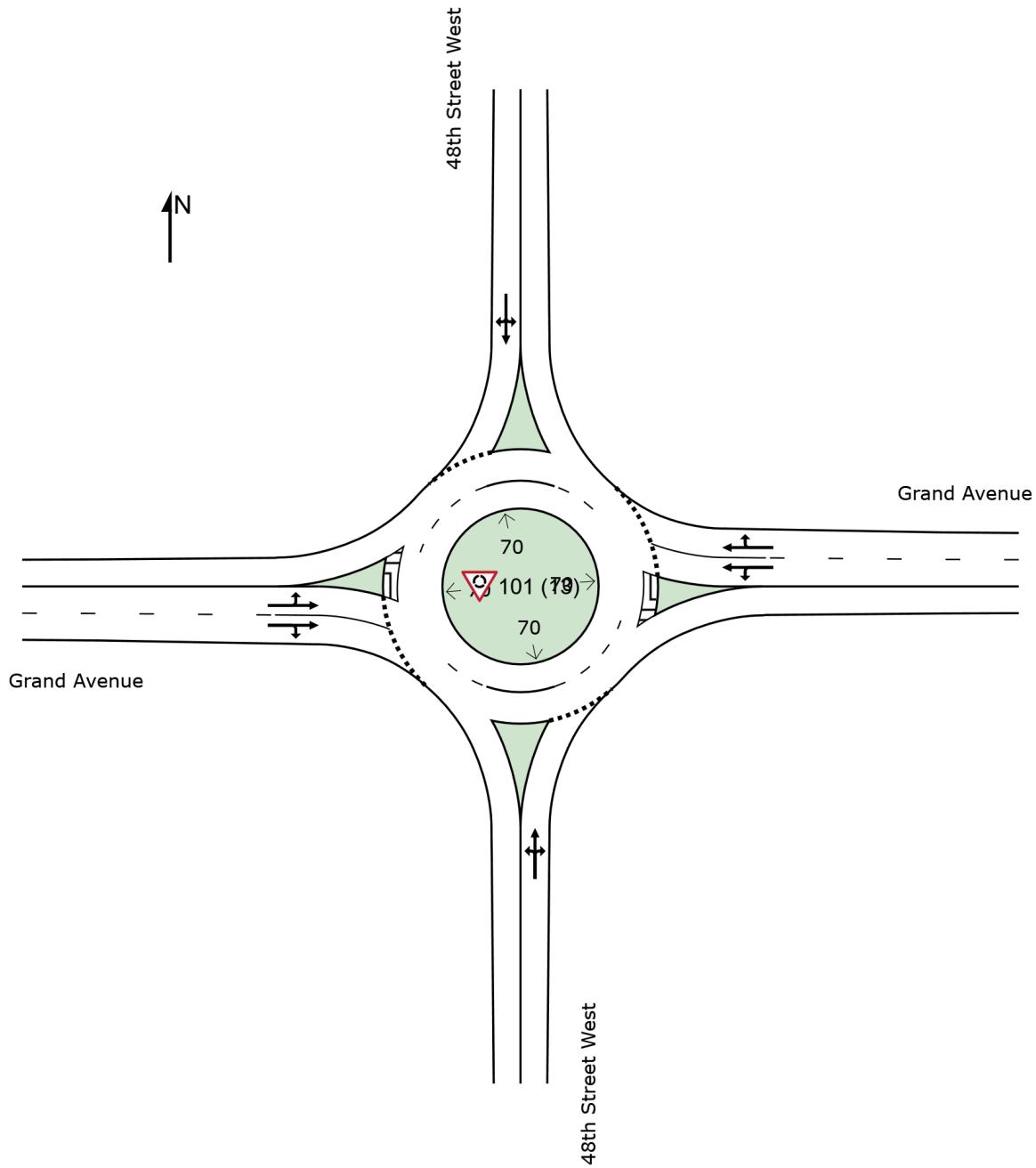
SITE LAYOUT

Site: [101 (13)] Grand Ave & 48th St AM Improved 2LN (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (13)] Grand Ave & 48th St AM Improved 2LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	16	0.0	16	0.0	0.031	4.5	LOS A	0.1	2.7	0.49	0.39	0.49	25.6
4	T1	All MCs	9	0.0	9	0.0	0.031	4.5	LOS A	0.1	2.7	0.49	0.39	0.49	25.9
14	R2	All MCs	1	0.0	1	0.0	0.031	4.5	LOS A	0.1	2.7	0.49	0.39	0.49	25.8
Approach			26	0.0	26	0.0	0.031	4.5	LOS A	0.1	2.7	0.49	0.39	0.49	25.7
West: Grand Avenue															
5	L2	All MCs	37	0.0	37	0.0	0.837	18.2	LOS C	21.9	551.3	0.92	0.69	1.26	22.6
2	T1	All MCs	1023	1.2	1023	1.2	0.837	17.9	LOS C	21.9	551.3	0.90	0.67	1.23	25.9
12	R2	All MCs	184	1.0	184	1.0	0.175	4.4	LOS A	0.8	19.5	0.29	0.15	0.29	30.4
Approach			1243	1.1	1243	1.1	0.837	15.9	LOS C	21.9	551.3	0.81	0.59	1.09	26.4
South: 48th Street West															
3	L2	All MCs	47	15.4	47	15.4	0.440	21.0	LOS C	1.8	46.4	0.73	0.81	0.96	26.2
8	T1	All MCs	16	0.0	16	0.0	0.440	13.1	LOS B	1.8	46.4	0.73	0.81	0.96	23.4
18	R2	All MCs	162	0.0	162	0.0	0.440	13.1	LOS B	1.8	46.4	0.73	0.81	0.96	26.6
Approach			225	3.2	225	3.2	0.440	14.6	LOS B	1.8	46.4	0.73	0.81	0.96	26.2
East: Grand Avenue															
1	L2	All MCs	117	1.5	117	1.5	0.402	6.5	LOS A	2.3	59.8	0.33	0.15	0.33	29.0
6	T1	All MCs	422	3.8	422	3.8	0.402	6.4	LOS A	2.3	59.8	0.32	0.14	0.32	29.5
16	R2	All MCs	67	0.0	67	0.0	0.084	3.4	LOS A	0.3	8.6	0.22	0.10	0.22	26.6
Approach			607	2.9	607	2.9	0.402	6.1	LOS A	2.3	59.8	0.31	0.14	0.31	29.1
All Vehicles			2101	1.9	2101	1.9	0.837	12.8	LOS B	21.9	551.3	0.65	0.48	0.84	27.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (14)] Grand Ave & 48th St PM Improved 2LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	5	0.0	5	0.0	0.019	8.3	LOS A	0.1	1.5	0.69	0.67	0.69	24.5
4	T1	All MCs	2	0.0	2	0.0	0.019	8.3	LOS A	0.1	1.5	0.69	0.67	0.69	24.8
14	R2	All MCs	1	0.0	1	0.0	0.019	8.3	LOS A	0.1	1.5	0.69	0.67	0.69	24.7
Approach			9	0.0	9	0.0	0.019	8.3	LOS A	0.1	1.5	0.69	0.67	0.69	24.6
West: Grand Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.444	7.6	LOS A	2.6	65.9	0.47	0.27	0.47	25.4
2	T1	All MCs	525	0.7	525	0.7	0.444	7.6	LOS A	2.6	65.9	0.47	0.27	0.47	29.5
12	R2	All MCs	100	0.0	100	0.0	0.093	3.8	LOS A	0.4	9.4	0.32	0.19	0.32	30.6
Approach			626	0.6	626	0.6	0.444	7.0	LOS A	2.6	65.9	0.45	0.26	0.45	29.6
South: 48th Street West															
3	L2	All MCs	151	1.2	151	1.2	0.290	7.2	LOS A	1.2	30.3	0.55	0.45	0.55	28.3
8	T1	All MCs	1	0.0	1	0.0	0.290	7.0	LOS A	1.2	30.3	0.55	0.45	0.55	25.0
18	R2	All MCs	105	0.0	105	0.0	0.290	7.0	LOS A	1.2	30.3	0.55	0.45	0.55	28.5
Approach			258	0.7	258	0.7	0.290	7.1	LOS A	1.2	30.3	0.55	0.45	0.55	28.3
East: Grand Avenue															
1	L2	All MCs	200	0.0	200	0.0	0.815	17.1	LOS C	19.4	485.3	0.87	0.66	1.20	25.6
6	T1	All MCs	1007	0.0	1007	0.0	0.815	14.6	LOS B	19.4	485.3	0.76	0.56	1.02	26.8
16	R2	All MCs	9	0.0	9	0.0	0.170	4.3	LOS A	0.8	18.9	0.30	0.15	0.30	26.5
Approach			1215	0.0	1215	0.0	0.815	14.9	LOS B	19.4	485.3	0.77	0.57	1.04	26.6
All Vehicles			2108	0.3	2108	0.3	0.815	11.6	LOS B	19.4	485.3	0.65	0.46	0.80	27.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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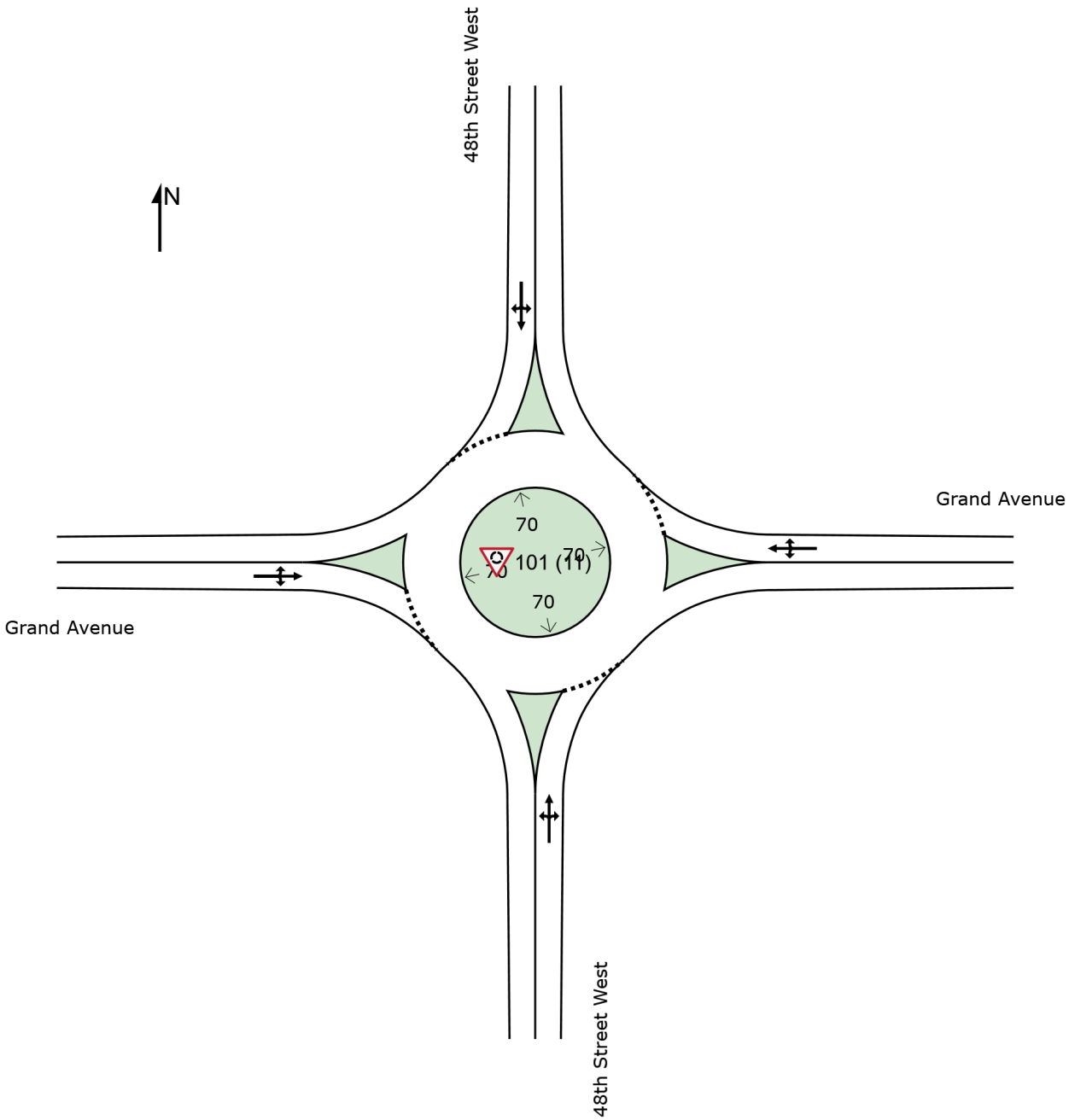
SITE LAYOUT

Site: [101 (11)] Grand Ave & 48th St AM Improved 1LN (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [101 (11)] Grand Ave & 48th St AM Improved 1LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	16	0.0	16	0.0	0.035	5.2	LOS A	0.1	3.4	0.55	0.45	0.55	25.4
4	T1	All MCs	9	0.0	9	0.0	0.035	5.2	LOS A	0.1	3.4	0.55	0.45	0.55	25.7
14	R2	All MCs	1	0.0	1	0.0	0.035	5.2	LOS A	0.1	3.4	0.55	0.45	0.55	25.6
Approach			26	0.0	26	0.0	0.035	5.2	LOS A	0.1	3.4	0.55	0.45	0.55	25.5
West: Grand Avenue															
5	L2	All MCs	37	0.0	37	0.0	1.056	53.1	LOS F	82.5	2081.6	1.00	2.13	2.72	16.7
2	T1	All MCs	1023	1.2	1023	1.2	1.056	53.2	LOS F	82.5	2081.6	1.00	2.13	2.72	18.4
12	R2	All MCs	184	1.0	184	1.0	1.056	53.2	LOS F	82.5	2081.6	1.00	2.13	2.72	18.4
Approach			1243	1.1	1243	1.1	1.056	53.2	LOS F	82.5	2081.6	1.00	2.13	2.72	18.4
South: 48th Street West															
3	L2	All MCs	47	15.4	47	15.4	0.500	23.3	LOS C	2.3	59.9	0.79	0.87	1.05	25.1
8	T1	All MCs	16	0.0	16	0.0	0.500	16.9	LOS C	2.3	59.9	0.79	0.87	1.05	22.6
18	R2	All MCs	162	0.0	162	0.0	0.500	16.9	LOS C	2.3	59.9	0.79	0.87	1.05	25.5
Approach			225	3.2	225	3.2	0.500	18.1	LOS C	2.3	59.9	0.79	0.87	1.05	25.2
East: Grand Avenue															
1	L2	All MCs	117	1.5	117	1.5	0.504	8.1	LOS A	3.7	94.5	0.41	0.19	0.41	28.5
6	T1	All MCs	422	3.8	422	3.8	0.504	8.3	LOS A	3.7	94.5	0.41	0.19	0.41	28.9
16	R2	All MCs	67	0.0	67	0.0	0.504	8.0	LOS A	3.7	94.5	0.41	0.19	0.41	25.1
Approach			607	2.9	607	2.9	0.504	8.2	LOS A	3.7	94.5	0.41	0.19	0.41	28.3
All Vehicles			2101	1.9	2101	1.9	1.056	35.9	LOS E	82.5	2081.6	0.80	1.41	1.85	21.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [101 (12)] Grand Ave & 48th St PM Improved 1LN (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	5	0.0	5	0.0	0.024	10.4	LOS B	0.1	2.1	0.75	0.74	0.75	24.0
4	T1	All MCs	2	0.0	2	0.0	0.024	10.4	LOS B	0.1	2.1	0.75	0.74	0.75	24.3
14	R2	All MCs	1	0.0	1	0.0	0.024	10.4	LOS B	0.1	2.1	0.75	0.74	0.75	24.1
Approach			9	0.0	9	0.0	0.024	10.4	LOS B	0.1	2.1	0.75	0.74	0.75	24.1
West: Grand Avenue															
5	L2	All MCs	1	0.0	1	0.0	0.561	9.8	LOS A	4.2	104.9	0.59	0.34	0.59	24.7
2	T1	All MCs	525	0.7	525	0.7	0.561	9.9	LOS A	4.2	104.9	0.59	0.34	0.59	28.6
12	R2	All MCs	100	0.0	100	0.0	0.561	9.8	LOS A	4.2	104.9	0.59	0.34	0.59	28.5
Approach			626	0.6	626	0.6	0.561	9.9	LOS A	4.2	104.9	0.59	0.34	0.59	28.6
South: 48th Street West															
3	L2	All MCs	151	1.2	151	1.2	0.326	8.4	LOS A	1.5	38.6	0.63	0.52	0.63	27.8
8	T1	All MCs	1	0.0	1	0.0	0.326	8.2	LOS A	1.5	38.6	0.63	0.52	0.63	24.7
18	R2	All MCs	105	0.0	105	0.0	0.326	8.2	LOS A	1.5	38.6	0.63	0.52	0.63	28.1
Approach			258	0.7	258	0.7	0.326	8.3	LOS A	1.5	38.6	0.63	0.52	0.63	27.9
East: Grand Avenue															
1	L2	All MCs	200	0.0	200	0.0	1.032	47.1	LOS F	74.8	1871.2	1.00	2.04	2.63	19.2
6	T1	All MCs	1007	0.0	1007	0.0	1.032	47.1	LOS F	74.8	1871.2	1.00	2.04	2.63	19.4
16	R2	All MCs	9	0.0	9	0.0	1.032	47.1	LOS F	74.8	1871.2	1.00	2.04	2.63	17.6
Approach			1215	0.0	1215	0.0	1.032	47.1	LOS E	74.8	1871.2	1.00	2.04	2.63	19.3
All Vehicles			2108	0.3	2108	0.3	1.032	31.1	LOS D	74.8	1871.2	0.83	1.35	1.77	22.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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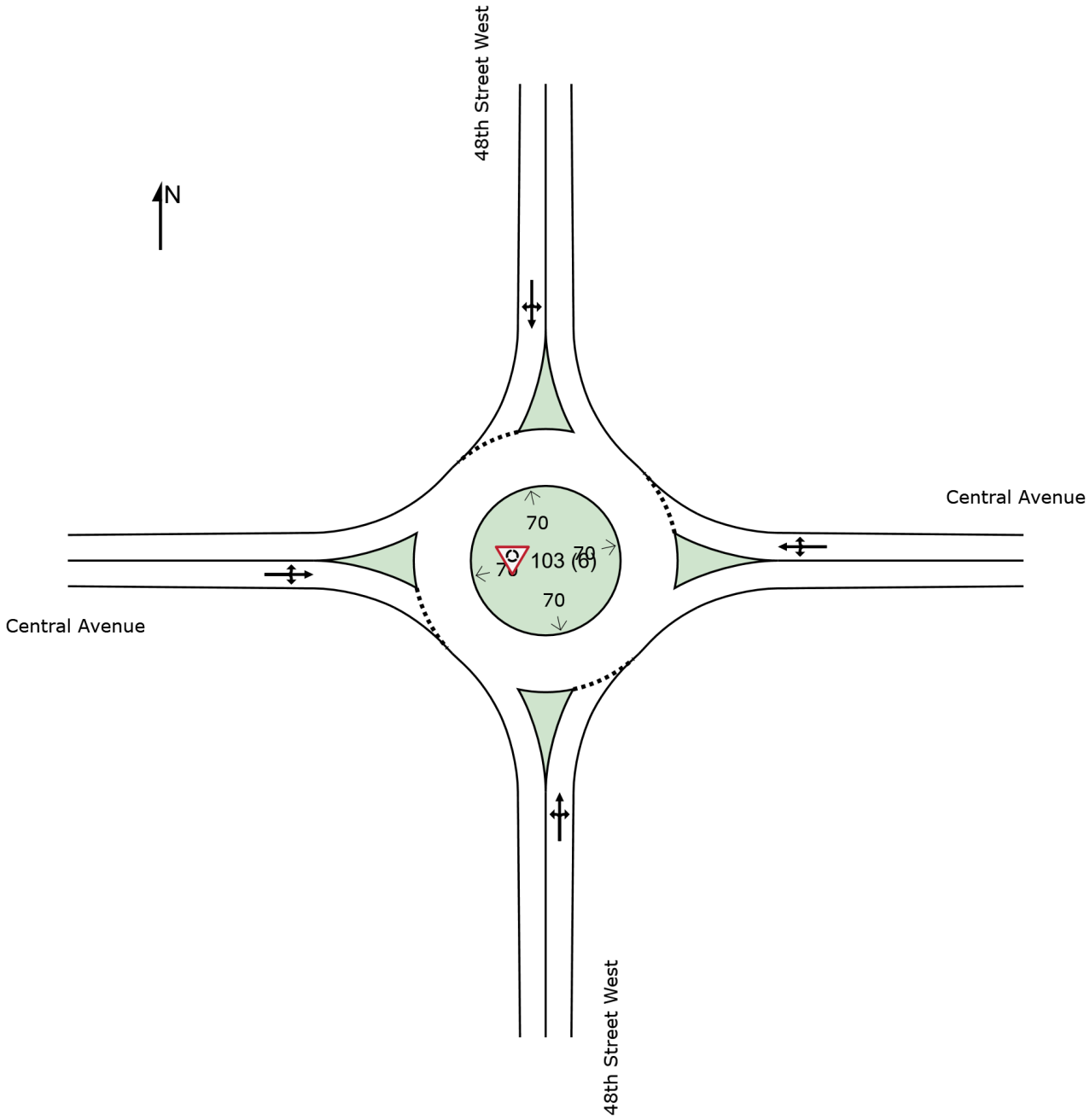
SITE LAYOUT

Site: [103 (6)] Central Ave & 48th St AM Improved (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [103 (6)] Central Ave & 48th St AM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	125	0.0	125	0.0	0.245	5.5	LOS A	1.2	31.0	0.41	0.24	0.41	35.0
4	T1	All MCs	125	0.0	125	0.0	0.245	5.5	LOS A	1.2	31.0	0.41	0.24	0.41	35.6
14	R2	All MCs	22	0.0	22	0.0	0.245	5.5	LOS A	1.2	31.0	0.41	0.24	0.41	35.3
Approach			272	0.0	272	0.0	0.245	5.5	LOS A	1.2	31.0	0.41	0.24	0.41	35.3
West: Central Avenue															
5	L2	All MCs	20	0.0	20	0.0	0.428	8.0	LOS A	2.5	63.6	0.56	0.36	0.56	34.5
2	T1	All MCs	357	0.5	357	0.5	0.428	8.1	LOS A	2.5	63.6	0.56	0.36	0.56	36.2
12	R2	All MCs	66	2.7	66	2.7	0.428	8.3	LOS A	2.5	63.6	0.56	0.36	0.56	35.6
Approach			442	0.8	442	0.8	0.428	8.1	LOS A	2.5	63.6	0.56	0.36	0.56	36.0
South: 48th Street West															
3	L2	All MCs	14	12.5	14	12.5	0.219	8.2	LOS A	0.9	23.8	0.58	0.46	0.58	34.3
8	T1	All MCs	70	5.1	70	5.1	0.219	7.1	LOS A	0.9	23.8	0.58	0.46	0.58	35.1
18	R2	All MCs	87	2.0	87	2.0	0.219	6.7	LOS A	0.9	23.8	0.58	0.46	0.58	36.3
Approach			171	4.1	171	4.1	0.219	7.0	LOS A	0.9	23.8	0.58	0.46	0.58	35.6
East: Central Avenue															
1	L2	All MCs	25	0.0	25	0.0	0.179	4.3	LOS A	0.8	21.8	0.27	0.12	0.27	37.5
6	T1	All MCs	167	3.2	167	3.2	0.179	4.5	LOS A	0.8	21.8	0.27	0.12	0.27	37.7
16	R2	All MCs	20	18.2	20	18.2	0.179	5.6	LOS A	0.8	21.8	0.27	0.12	0.27	34.1
Approach			212	4.2	212	4.2	0.179	4.5	LOS A	0.8	21.8	0.27	0.12	0.27	37.3
All Vehicles			1097	1.8	1097	1.8	0.428	6.6	LOS A	2.5	63.6	0.47	0.30	0.47	36.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [103 (7)] Central Ave & 48th St PM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	64	0.0	64	0.0	0.282	7.9	LOS A	1.3	31.8	0.63	0.53	0.63	34.0
4	T1	All MCs	130	1.4	130	1.4	0.282	8.1	LOS A	1.3	31.8	0.63	0.53	0.63	34.5
14	R2	All MCs	17	0.0	17	0.0	0.282	7.9	LOS A	1.3	31.8	0.63	0.53	0.63	34.4
Approach			212	0.9	212	0.9	0.282	8.0	LOS A	1.3	31.8	0.63	0.53	0.63	34.3
West: Central Avenue															
5	L2	All MCs	27	0.0	27	0.0	0.302	6.1	LOS A	1.5	39.6	0.47	0.29	0.47	35.4
2	T1	All MCs	253	2.8	253	2.8	0.302	6.4	LOS A	1.5	39.6	0.47	0.29	0.47	36.8
12	R2	All MCs	34	5.3	34	5.3	0.302	6.7	LOS A	1.5	39.6	0.47	0.29	0.47	36.0
Approach			314	2.8	314	2.8	0.302	6.4	LOS A	1.5	39.6	0.47	0.29	0.47	36.6
South: 48th Street West															
3	L2	All MCs	82	0.0	82	0.0	0.284	6.6	LOS A	1.4	35.2	0.53	0.38	0.53	35.8
8	T1	All MCs	150	0.0	150	0.0	0.284	6.6	LOS A	1.4	35.2	0.53	0.38	0.53	35.5
18	R2	All MCs	42	0.0	42	0.0	0.284	6.6	LOS A	1.4	35.2	0.53	0.38	0.53	36.2
Approach			274	0.0	274	0.0	0.284	6.6	LOS A	1.4	35.2	0.53	0.38	0.53	35.7
East: Central Avenue															
1	L2	All MCs	50	0.0	50	0.0	0.566	10.4	LOS B	4.9	122.8	0.65	0.45	0.75	34.2
6	T1	All MCs	449	0.4	449	0.4	0.566	10.4	LOS B	4.9	122.8	0.65	0.45	0.75	34.8
16	R2	All MCs	95	3.8	95	3.8	0.566	10.8	LOS B	4.9	122.8	0.65	0.45	0.75	33.1
Approach			593	0.9	593	0.9	0.566	10.5	LOS B	4.9	122.8	0.65	0.45	0.75	34.5
All Vehicles			1393	1.2	1393	1.2	0.566	8.4	LOS A	4.9	122.8	0.58	0.41	0.62	35.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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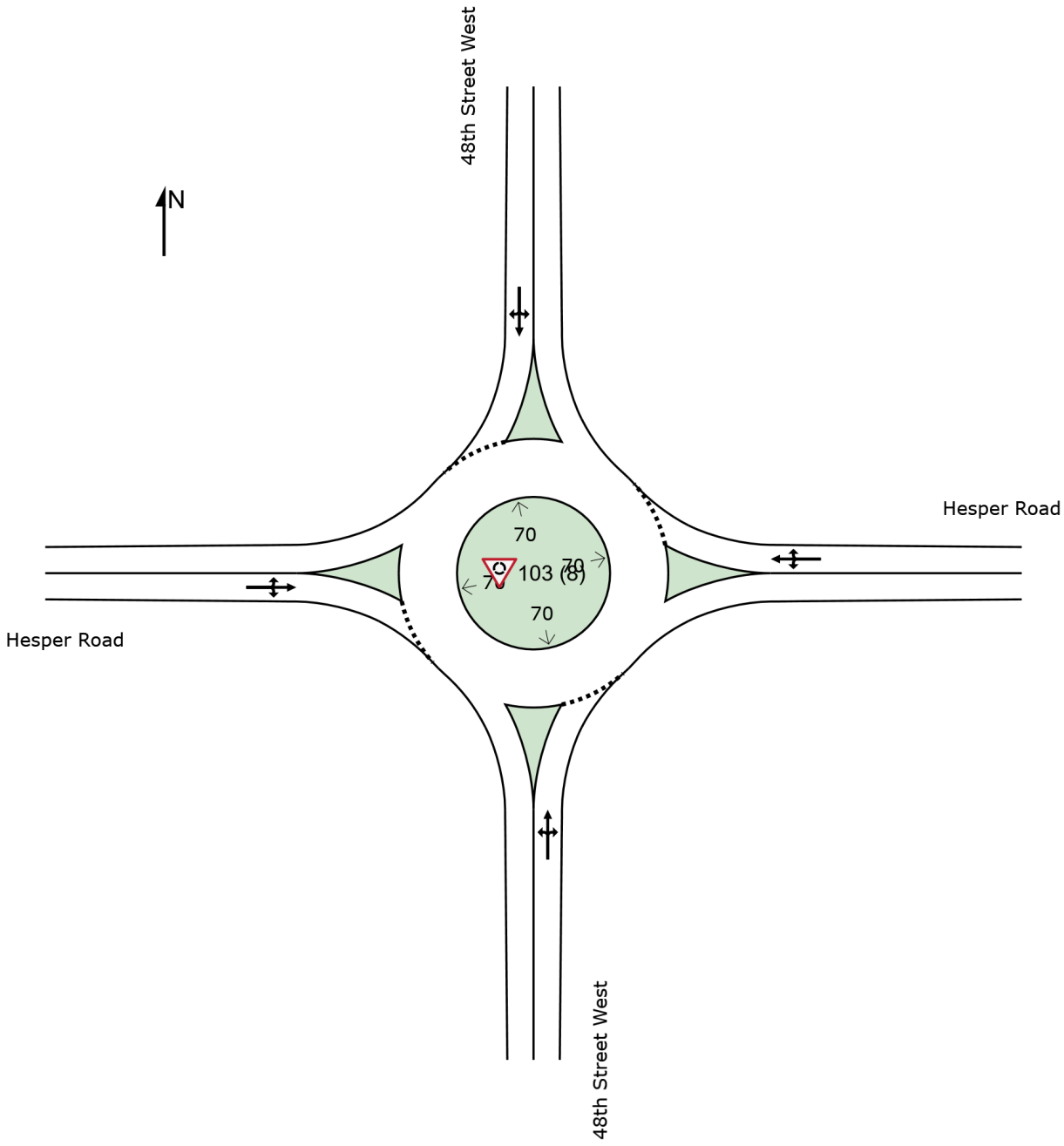
SITE LAYOUT

Site: [103 (8)] Hesper Rd & 48th St AM Improved (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [103 (8)] Hesper Rd & 48th St AM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	116	1.5	116	1.5	0.170	4.6	LOS A	0.8	20.0	0.36	0.20	0.36	35.8
4	T1	All MCs	50	3.6	50	3.6	0.170	4.8	LOS A	0.8	20.0	0.36	0.20	0.36	36.2
14	R2	All MCs	22	8.3	22	8.3	0.170	5.2	LOS A	0.8	20.0	0.36	0.20	0.36	35.2
Approach			188	2.8	188	2.8	0.170	4.7	LOS A	0.8	20.0	0.36	0.20	0.36	35.9
West: Hesper Road															
5	L2	All MCs	30	5.9	30	5.9	0.431	7.9	LOS A	2.6	67.3	0.48	0.27	0.48	34.8
2	T1	All MCs	426	5.4	426	5.4	0.431	7.9	LOS A	2.6	67.3	0.48	0.27	0.48	35.6
12	R2	All MCs	9	0.0	9	0.0	0.431	7.4	LOS A	2.6	67.3	0.48	0.27	0.48	36.0
Approach			465	5.3	465	5.3	0.431	7.9	LOS A	2.6	67.3	0.48	0.27	0.48	35.6
South: 48th Street West															
3	L2	All MCs	9	20.0	9	20.0	0.120	9.0	LOS A	0.4	11.7	0.58	0.49	0.58	33.4
8	T1	All MCs	50	3.6	50	3.6	0.120	6.2	LOS A	0.4	11.7	0.58	0.49	0.58	36.5
18	R2	All MCs	23	7.7	23	7.7	0.120	6.8	LOS A	0.4	11.7	0.58	0.49	0.58	35.6
Approach			82	6.5	82	6.5	0.120	6.6	LOS A	0.4	11.7	0.58	0.49	0.58	35.9
East: Hesper Road															
1	L2	All MCs	14	0.0	14	0.0	0.166	4.0	LOS A	0.7	20.0	0.25	0.11	0.25	37.6
6	T1	All MCs	148	9.6	148	9.6	0.166	4.6	LOS A	0.7	20.0	0.25	0.11	0.25	37.0
16	R2	All MCs	30	5.9	30	5.9	0.166	4.3	LOS A	0.7	20.0	0.25	0.11	0.25	37.1
Approach			192	8.3	192	8.3	0.166	4.5	LOS A	0.7	20.0	0.25	0.11	0.25	37.0
All Vehicles			927	5.5	927	5.5	0.431	6.4	LOS A	2.6	67.3	0.41	0.24	0.41	35.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [103 (9)] Hesper Rd & 48th St PM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: 48th Street West															
7	L2	All MCs	34	5.3	34	5.3	0.131	6.7	LOS A	0.5	13.4	0.57	0.48	0.57	35.2
4	T1	All MCs	48	0.0	48	0.0	0.131	5.9	LOS A	0.5	13.4	0.57	0.48	0.57	36.7
14	R2	All MCs	16	0.0	16	0.0	0.131	5.9	LOS A	0.5	13.4	0.57	0.48	0.57	36.4
Approach			98	1.8	98	1.8	0.131	6.2	LOS A	0.5	13.4	0.57	0.48	0.57	36.1
West: Hesper Road															
5	L2	All MCs	14	12.5	14	12.5	0.249	6.0	LOS A	1.3	32.7	0.32	0.16	0.32	35.2
2	T1	All MCs	278	1.9	278	1.9	0.249	5.2	LOS A	1.3	32.7	0.32	0.16	0.32	37.7
12	R2	All MCs	2	0.0	2	0.0	0.249	5.1	LOS A	1.3	32.7	0.32	0.16	0.32	37.7
Approach			295	2.4	295	2.4	0.249	5.2	LOS A	1.3	32.7	0.32	0.16	0.32	37.6
South: 48th Street West															
3	L2	All MCs	3	0.0	3	0.0	0.112	4.7	LOS A	0.5	12.1	0.45	0.31	0.45	37.7
8	T1	All MCs	73	0.0	73	0.0	0.112	4.7	LOS A	0.5	12.1	0.45	0.31	0.45	38.5
18	R2	All MCs	34	0.0	34	0.0	0.112	4.7	LOS A	0.5	12.1	0.45	0.31	0.45	38.1
Approach			110	0.0	110	0.0	0.112	4.7	LOS A	0.5	12.1	0.45	0.31	0.45	38.3
East: Hesper Road															
1	L2	All MCs	45	0.0	45	0.0	0.513	8.1	LOS A	4.0	99.7	0.39	0.17	0.39	35.5
6	T1	All MCs	522	0.7	522	0.7	0.513	8.1	LOS A	4.0	99.7	0.39	0.17	0.39	36.1
16	R2	All MCs	75	0.0	75	0.0	0.513	8.1	LOS A	4.0	99.7	0.39	0.17	0.39	35.9
Approach			641	0.6	641	0.6	0.513	8.1	LOS A	4.0	99.7	0.39	0.17	0.39	36.0
All Vehicles			1143	1.1	1143	1.1	0.513	6.9	LOS A	4.0	99.7	0.40	0.21	0.40	36.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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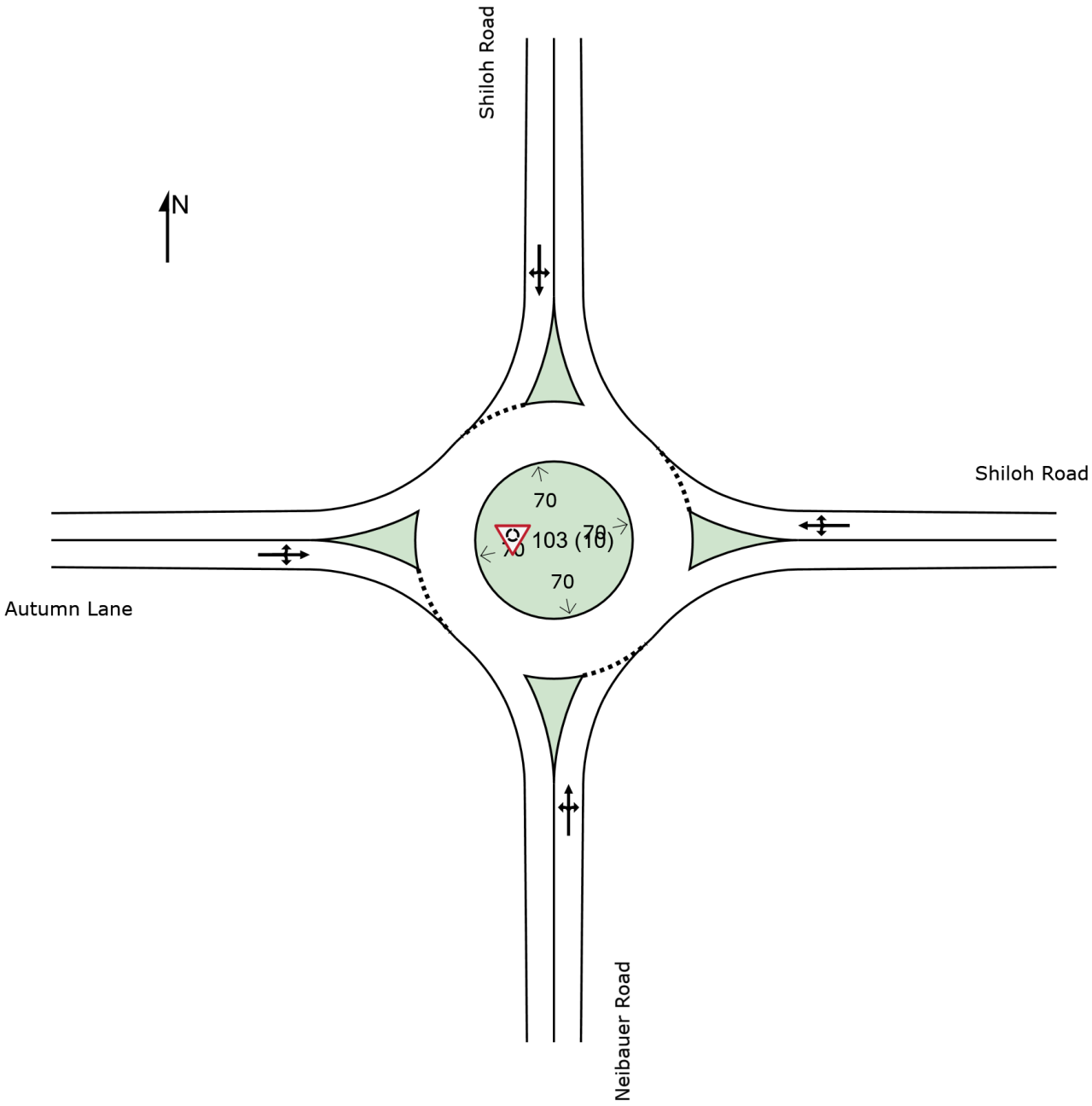
SITE LAYOUT

Site: [103 (10)] Neibauer Rd & Shiloh Rd AM Improved (Future (2044) w/ Improvements)

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [103 (10)] Neibauer Rd & Shiloh Rd AM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: Shiloh Road															
7	L2	All MCs	142	2.5	142	2.5	0.303	5.6	LOS A	1.5	41.4	0.36	0.18	0.36	33.3
4	T1	All MCs	187	15.0	187	15.0	0.303	6.6	LOS A	1.5	41.4	0.36	0.18	0.36	32.4
14	R2	All MCs	1	0.0	1	0.0	0.303	5.4	LOS A	1.5	41.4	0.36	0.18	0.36	34.0
Approach			330	9.6	330	9.6	0.303	6.2	LOS A	1.5	41.4	0.36	0.18	0.36	32.8
West: Autumn Lane															
5	L2	All MCs	1	0.0	1	0.0	0.004	4.4	LOS A	0.0	0.4	0.50	0.31	0.50	34.9
2	T1	All MCs	1	0.0	1	0.0	0.004	4.4	LOS A	0.0	0.4	0.50	0.31	0.50	35.6
12	R2	All MCs	1	0.0	1	0.0	0.004	4.4	LOS A	0.0	0.4	0.50	0.31	0.50	35.3
Approach			3	0.0	3	0.0	0.004	4.4	LOS A	0.0	0.4	0.50	0.31	0.50	35.3
South: Neibauer Road															
3	L2	All MCs	1	0.0	1	0.0	0.485	7.9	LOS A	3.1	83.7	0.47	0.24	0.47	33.5
8	T1	All MCs	374	10.0	374	10.0	0.485	8.8	LOS A	3.1	83.7	0.47	0.24	0.47	32.8
18	R2	All MCs	153	4.7	153	4.7	0.485	8.3	LOS A	3.1	83.7	0.47	0.24	0.47	33.2
Approach			528	8.4	528	8.4	0.485	8.6	LOS A	3.1	83.7	0.47	0.24	0.47	33.0
East: Shiloh Road															
1	L2	All MCs	120	13.4	120	13.4	0.457	11.2	LOS B	2.8	73.8	0.66	0.54	0.78	30.5
6	T1	All MCs	1	0.0	1	0.0	0.457	9.3	LOS A	2.8	73.8	0.66	0.54	0.78	32.8
16	R2	All MCs	268	0.7	268	0.7	0.457	9.4	LOS A	2.8	73.8	0.66	0.54	0.78	32.5
Approach			389	4.6	389	4.6	0.457	9.9	LOS A	2.8	73.8	0.66	0.54	0.78	31.9
All Vehicles			1251	7.5	1251	7.5	0.485	8.4	LOS A	3.1	83.7	0.50	0.32	0.54	32.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [103 (11)] Neibauer Rd & Shiloh Rd PM Improved (Future (2044) w/ Improvements)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
North: Shiloh Road															
7	L2	All MCs	260	0.0	260	0.0	0.513	8.2	LOS A	3.9	97.9	0.43	0.20	0.43	32.7
4	T1	All MCs	371	0.5	371	0.5	0.513	8.3	LOS A	3.9	97.9	0.43	0.20	0.43	33.3
14	R2	All MCs	1	0.0	1	0.0	0.513	8.2	LOS A	3.9	97.9	0.43	0.20	0.43	33.1
Approach			632	0.3	632	0.3	0.513	8.3	LOS A	3.9	97.9	0.43	0.20	0.43	33.0
West: Autumn Lane															
5	L2	All MCs	1	0.0	1	0.0	0.005	5.6	LOS A	0.0	0.5	0.58	0.42	0.58	34.2
2	T1	All MCs	1	0.0	1	0.0	0.005	5.6	LOS A	0.0	0.5	0.58	0.42	0.58	34.9
12	R2	All MCs	1	0.0	1	0.0	0.005	5.6	LOS A	0.0	0.5	0.58	0.42	0.58	34.6
Approach			3	0.0	3	0.0	0.005	5.6	LOS A	0.0	0.5	0.58	0.42	0.58	34.6
South: Neibauer Road															
3	L2	All MCs	1	0.0	1	0.0	0.313	6.3	LOS A	1.6	41.0	0.48	0.31	0.48	34.5
8	T1	All MCs	229	5.4	229	5.4	0.313	6.8	LOS A	1.6	41.0	0.48	0.31	0.48	34.4
18	R2	All MCs	86	0.0	86	0.0	0.313	6.3	LOS A	1.6	41.0	0.48	0.31	0.48	34.8
Approach			316	3.9	316	3.9	0.313	6.7	LOS A	1.6	41.0	0.48	0.31	0.48	34.5
East: Shiloh Road															
1	L2	All MCs	105	1.7	105	1.7	0.727	15.0	LOS C	12.5	316.9	0.82	0.71	1.26	30.1
6	T1	All MCs	1	0.0	1	0.0	0.727	14.8	LOS B	12.5	316.9	0.82	0.71	1.26	30.8
16	R2	All MCs	661	1.6	661	1.6	0.727	15.0	LOS C	12.5	316.9	0.82	0.71	1.26	30.4
Approach			767	1.6	767	1.6	0.727	15.0	LOS C	12.5	316.9	0.82	0.71	1.26	30.4
All Vehicles			1718	1.5	1718	1.5	0.727	11.0	LOS B	12.5	316.9	0.61	0.44	0.81	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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