

# Appendix 4

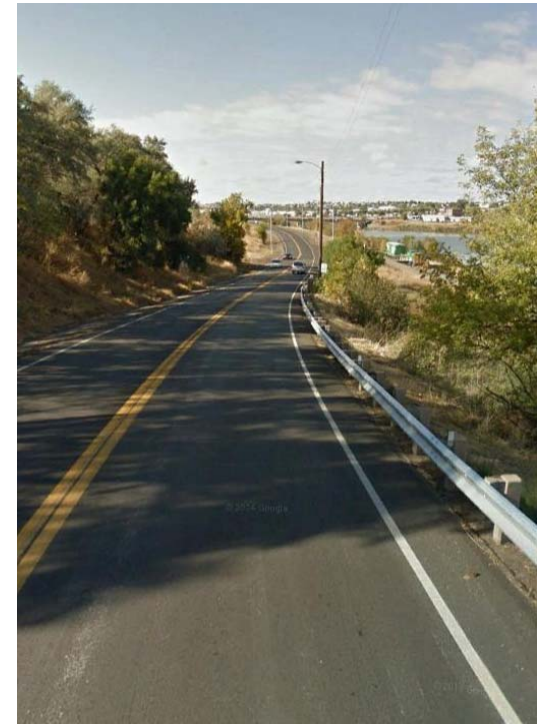
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## *Existing and Projected Conditions Technical Memorandum*



# EXISTING AND PROJECTED CONDITIONS

*Technical Memorandum*



March 14, 2016



Prepared for:  
Montana Department of  
Transportation



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# Existing and Projected Conditions

## 1.0. INTRODUCTION

This report identifies existing and projected roadway conditions, as well as social, economic, and environmental factors that influence the River Drive North corridor in Great Falls. The analysis performed includes a planning-level examination of the corridor by applying technical and environmental considerations to determine known issues, constraints, and/or areas of concern.

The analysis contained in this report is based on existing and historic traffic data, field measurements and observations, roadway as-built plans, aerial imagery, Geographical Information Systems (GIS), and publically available environmental information and demographics.

## 1.1. STUDY AREA

The study area for the *River Drive Corridor Study* includes a two mile segment of River Drive North in northern Great Falls. The corridor begins at the intersection with 15<sup>th</sup> Street North (Reference Post [RP] 3.4) and ends at the intersection with 38<sup>th</sup> Street North (RP 5.4). A 200-foot buffer from centerline along both sides of the roadway was used to define the study area. **Figure 1** presents the location of the corridor and the study area.

The north side of the corridor is generally constrained by the Missouri River. In addition, the River's Edge Trail parallels the corridor between the river and the roadway. South of the roadway, the land consists of commercial and residential development between 15<sup>th</sup> Street North and 25<sup>th</sup> Street North. Recreational development exists on the south side of the road east of 25<sup>th</sup> Street North.

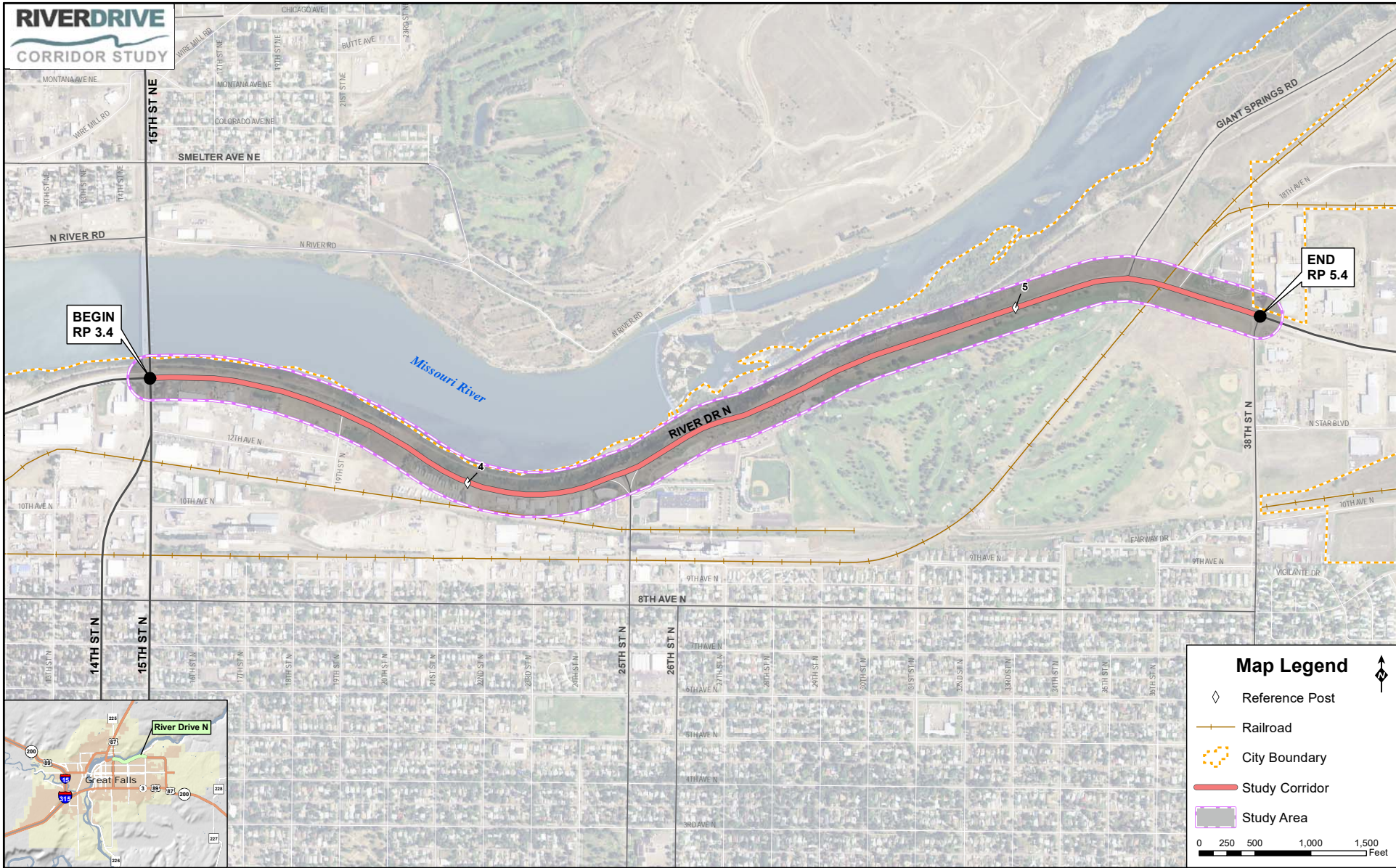


Figure 1: Study Area Boundary

## 1.2. PAST, CURRENT AND PLANNED PROJECTS

River Drive North was originally constructed in 1945. Since then, numerous projects have been constructed. A search of the Montana Department of Transportation (MDT) online summary of road and bridge construction projects was reviewed to identify notable projects within the study area. A list of recent projects, along with the letting date and a brief description, are shown in **Table 1**. The list is not an all-inclusive list of projects, rather, it is only a list of recent major projects completed along the corridor. The list does not include maintenance projects performed by MDT such as guardrail repair, pothole repair, striping, or other similar project. In addition, there have been multiple Community Transportation Enhancement Program (CTEP) projects within the study area. The CTEP projects include non-motorized improvements, such as the River's Edge Trail and the Caboose Trailhead.

**Table 1: Recent Projects within the Study Area**

Project Name	ID Number	UPN	Letting Date	Description
<b>15<sup>th</sup> St. and River Drive – Great Falls – Cascade County</b>	NH 10-1(15)3	1356	22-FEB-96	Improvements to the intersection at 15 <sup>th</sup> Street North and River Drive North.
<b>Giant Springs Road – Great Falls</b>	PLH-STPU 5221(3)	4694	26-JUL-01	Improvements to Giant Springs Road including the intersection of River Drive North.
<b>Northeast Bypass – Great Falls</b>	NH-STPE 5205(18)	4042	27-MAY-04	Reconstruction of the Northeast Bypass between 38 <sup>th</sup> Street North and 2 <sup>nd</sup> Avenue North. Included installation of a traffic signal at the intersection with 38 <sup>th</sup> Street North.
<b>River Dr – 15<sup>th</sup> to 25<sup>th</sup> (GTFLS)</b>	NH 102-1(4)3	6953	02-DEC-10	Pavement preservation of River Drive North between 15 <sup>th</sup> Street North and 25 <sup>th</sup> Street North. Included street lighting.
<b>River Dr – 25<sup>th</sup> to 38<sup>th</sup> (GTF)</b>	NH 102-1(8)4	7627	26-APR-12	Pavement preservation of River Drive North between 25 <sup>th</sup> Street North and 38 <sup>th</sup> Street North. Included digouts and a mechanically stabilized earth retaining wall.

Source: MDT Project List accessible at [http://www3.mdt.mt.gov:7782/mttplc/mttplc.tplk0007.project\\_init](http://www3.mdt.mt.gov:7782/mttplc/mttplc.tplk0007.project_init)

Two future projects are planned within the study area. Project UPN 8879 will result in construction of an overlook along River Drive North near the intersection of 25<sup>th</sup> Street North. Project UPN 5556 includes construction of a new bicycle/pedestrian bridge along 25<sup>th</sup> Street North just south of River Drive North. This project also includes sidewalk, curb, and landscaping.

## 1.3. LOCAL PLANNING

Local planning documents and regulations were reviewed for relevance to transportation within the study area. Improvement options identified as part of this study should be reviewed for continuity with existing local plans and regulations. In addition, a review for updated planning documents should take place during the project development process. The following provides a summary of relevant planning documents.



### *Great Falls Area Long Range Transportation Plan – 2014*

The *Great Falls Area Long Range Transportation Plan (LRTP) – 2014*<sup>1</sup> is intended to offer guidance for the decision-makers in the Great Falls Area by responding to existing and future transportation system concerns through a menu of large and small improvements to the transportation network. The LRTP provides a blueprint for guiding transportation infrastructure investments based on system needs and associated decision-making principles. Several items were noted in the LRTP that should be taken into consideration during the corridor study. The following provides a summary of recommended improvement options identified along the study corridor.

#### **MSN-1: River Drive North – 15<sup>th</sup> Street North to 38<sup>th</sup> Street North**

The existing two-lane facility will be inadequate to handle future traffic volumes. An expansion of the existing facility will be needed by the year 2035, and probably sooner given current travel characteristics exhibited during peak travel hours. Due to a high level of public interest in this corridor and its close proximity to the Missouri River and River's Edge Trail, it is recommended that a detailed corridor study and environmental assessment be undertaken prior to any design or construction which would consider reconstruction scenarios for River Drive North (15<sup>th</sup> Street North to 38<sup>th</sup> Street North). A corridor planning study should be entertained before proceeding with any project(s), which would then help inform the level of environmental documentation required.

The reconstruction of the facility along its existing alignment should be to a minimum three-lane principal arterial standard. It is recommended that any roadway widening be to the south and away from the river. The entire reconstruction of the facility could be constructed in two phases. Phase 1 could include the segment between 15<sup>th</sup> Street North and 25<sup>th</sup> Street North, while phase 2 could occur later in the planning horizon and include the segment between 25<sup>th</sup> Street North and 38<sup>th</sup> Street North. Coincident to project development activities, an assessment to the viability of non-motorized amenities should be made as public sentiment and stakeholder feedback has identified this route as an important gap in the visionary bicycle network for the community.

#### **Illustrative MSN-20: 25<sup>th</sup> Street North – River Drive to 2<sup>nd</sup> Avenue North**

Reconstruct to a minor arterial street standard. The roadway currently exhibits a mixture of urban and rural road characteristics. It is desirable to reconstruct the road to an urban minor arterial to accommodate increasing traffic, provide better non-motorized facilities and connectivity, and plan for the varied uses in the area. The project would require a new bridge crossing of the railroad. The intersection of 25<sup>th</sup> Street North and River Drive North should be reconstructed with consideration for either traffic signalization or a modern roundabout.

#### **Non-motorized Recommendations**

- **River Drive North (15<sup>th</sup> Street North to 38<sup>th</sup> Street North):** If River Drive North is improved to a 3-lane arterial section, an assessment to the viability of on-street bike lanes should be made as public sentiment and stakeholder feedback has identified this route as an important gap in the visionary bicycle network for the community.

- **15<sup>th</sup> Street North Connector Trail (15<sup>th</sup> Street North to 19<sup>th</sup> Street North):** If deemed feasible, construct a shared-use path on the north side of River Drive between 15<sup>th</sup> Street North and 19<sup>th</sup> Street North. The path would connect the River's Edge Trail to the intersection of 15<sup>th</sup> Street North and River Drive.
- **15<sup>th</sup> Street North and River Drive North (Intersection Improvement – Buffered Bike Lanes):** Construct intersection improvements to facilitate connections from 15<sup>th</sup> Street North to the proposed 15<sup>th</sup> Street North Connector Trail.
- **25<sup>th</sup> Street North and River Drive North (Trail Connection – Shared Use Pathway):** If deemed feasible, provide a shared-use connection between 25<sup>th</sup> Street North and the River's Edge Trail. The connection could be considered by either a trail descending from River Drive down to the River's Edge Trail, or by a tunnel connecting to Veteran's Memorial Park. This connection would tie into the proposed 25<sup>th</sup> Street North bike lanes and the currently under development pedestrian bridge over the railroad tracks along 25<sup>th</sup> Street North.

#### *Cascade County Growth Policy Update (2014)*

The *Cascade County Growth Policy Update (2014)*<sup>2</sup> was drafted as a comprehensive plan to provide guidance on decisions regarding land development and public investments within Cascade County. The document outlines 13 goals, of which the transportation goal is most relevant to this study. The transportation goal is to, "promote and maintain a transportation system that provides safety, efficiency, and is cost effective". In addition, nine objectives are listed to help achieve this goal.

#### *City of Great Falls Growth Policy Update (2013)*

The *City of Great Falls Growth Policy Update (2013)*<sup>3</sup> is intended to provide guidance to the local government with regard to establishing policy and a framework to guide the social, environmental, economic, and physical makeup of the city of Great Falls. The Growth Policy recognizes that transportation and growth go hand in hand. Specific to the study corridor, the Growth Policy notes that existing traffic volumes on River Drive North, between 15<sup>th</sup> Street North and 25<sup>th</sup> Street North, currently exceed optimal levels for the number of lanes present.

A number of goals and policies were crafted around four primary focus areas: Social, Environmental, Economic and Physical. In all four focus areas there are transportation related policies interwoven throughout. There are multiple policies identified to improve transportation system form and function throughout the Growth Policy. Perhaps most specific to transportation in the community is information developed under the "transportation and mobility" goal found under the Physical focus area. The transportation and mobility goal is to, "increase mobility and the access of citizens to transportation alternatives throughout the City". Twelve policies are identified as part of this goal.

#### *Great Falls Transit Development Plan (2010)*

The *Great Falls Transit Development Plan (TDP)*<sup>4</sup> was developed to analyze and recommend strategies that will affect the delivery of public transportation services for the Great Falls Transit District. The TDP states the following: "The mission of the Great Falls Transit District is to provide a safe, reliable, affordable and fiscally sound transportation system for the people of Great Falls and Black Eagle, Montana." Currently no fixed routes use the study corridor. Furthermore, no new alternative routes are recommended within the study area.

#### *River Drive North Feasibility Study (2009)*

The *River Drive North Feasibility Study*<sup>5</sup> was developed as an academic exercise with students of the George Mason University, Transportation Policy, Operations and Logistics Program in cooperation with MDT and the City of Great Falls. The purpose of the study was to research and develop alternatives to improving River Drive North between 15<sup>th</sup> Street North and 38<sup>th</sup> Street North.

The study recommends that the River Drive North corridor be reconstructed to include two travel lanes (one in each direction), left-turn lanes where necessary, and improvements to roadway geometrics to improve safety and operations. The study notes that the recommended configuration does not fully meet capacity demands, but would result in less impacts to adjacent landowners and would have less constraints than a four-lane roadway.

The study recommends that a new bridge across the Missouri River be evaluated as a long-term improvement option to connect River Drive North near Giant Springs Road to Smelter Avenue on the north side of the river. Additional recommendations were made for further analysis of additional traffic control at the intersection with 25<sup>th</sup> Street North, and for a grade separated railroad crossing east of 38<sup>th</sup> Street North.

#### *Great Falls Arterial Studies (2004 – 2009)*

The 2004 *Great Falls Arterial Feasibility Study*<sup>6</sup> evaluated the engineering and economic feasibility of two possible arterial routes connecting Interstate 15 west of Great Falls with US Highway 87/89 east of Great Falls. A northern corridor and a southern corridor were evaluated. The study concluded that a southern arterial would provide a more favorable benefit/cost ratio than a northern arterial. The report recommended the continued development of the southern corridor to include preparation of a route location study, preparation of an appropriate environmental document, and development of project design activities.

In response to the 2004 study, the *Great Falls South Arterial Alignment Study*<sup>7</sup> was conducted in 2009. The *Great Falls South Arterial Alignment Study* built on analysis from the 2004 study by providing a more detailed analysis of the opportunities and constraints in the general study area. The study identified engineering, environmental, and funding challenges and provided preliminary cost estimates to aid in the identification of a recommended alignment for the south arterial. The study ultimately recommended a four-lane rural principal arterial alignment. However, on April 5, 2010, the Great Falls Policy Coordinating Committee, as the official decision making body for the Great Falls transportation planning process, took action to cease work on the development of a south arterial.

#### *Missouri River Urban Corridor Plan (2004)*

The *Missouri River Urban Corridor Plan*<sup>8</sup> examined and planned for lands adjoining the Missouri River in the core of the Great Falls urban area. The plan was conceived as an ongoing vision, recognizing the challenge of transitioning historic and industrial land uses over time. The plan recognizes that some development patterns along the river corridor represented an opportunity for more desirable, sustainable development that would capitalize on the river as an amenity and a resource. The plan provided a heavy transportation focus for typical sections and gateway treatments, and included River Drive North between 15<sup>th</sup> Street North and 32<sup>nd</sup> Street North.



## 2.0. TRANSPORTATION SYSTEM

River Drive North serves as a key route in the Great Falls transportation system and supports both local access and regional travel demand. Within the study area, the roadway is classified as a principal arterial roadway on the Non-interstate National Highway System (NHS). The corridor is a designated truck route and provides access to several businesses, industrial areas, residential neighborhoods, community resources, and recreation areas. The corridor is part of the US Highway 87 bypass which connects 10<sup>th</sup> Avenue South to 15<sup>th</sup> Street North.

The following sections discuss the transportation-specific aspects of the study corridor. Information obtained from publically available sources, field observations, data collection efforts, GIS data, and as-built drawings were used to evaluate the transportation system.

### 2.1. PHYSICAL FEATURES AND CHARACTERISTICS

The roadway was constructed or improved at various times, beginning in 1945. The study corridor consists of two travel lanes, one in each direction, and serves as a key route, supporting both local access, and regional travel demand. The north side of the roadway is generally constrained by the Missouri River and River's Edge Trail. West of 25<sup>th</sup> Street North, there are commercial, light industrial, residential, and recreational developments on the south side of the roadway. The Veteran's Memorial Park and Eagle Falls Golf Club are located on the south side of the roadway to the west of 25<sup>th</sup> Street North.

#### 2.1.1. Roadway Surfacing

The MDT *Road Log*<sup>9</sup> contains information for roadway surface width, lane width, shoulder width, surfacing thickness, and base thickness. According to the *Road Log*, the study corridor consists of a 30-foot paved roadway. The paved surface includes two 12-foot travel lanes and 3-foot shoulders on each side of the roadway. The MDT *Road Design Manual* requires a minimum travel lane width of 12 feet. The MDT *NHS Route Segment Plan* suggests a width of 40 feet or greater for the corridor. However, the *NHS Route Segment Plan* no longer defines the standard roadway width. The MDT Roadway Width Committee is responsible for determining the appropriate width during future project development.

#### *Pavement Condition*

MDT annually tracks and measures pavement condition indices along the corridor. MDT's Pavement Management System (PvMS) is used to analyze the collected data to determine the relative performance of the pavement. Items of primary interest include the presence and degree of cracking and rutting, as well as overall ride quality. By understanding the condition of the pavement, MDT can identify the most appropriate treatments and resources needed to extend pavement life. Several pavement condition indices are monitored through MDT's PvMS. The performance measures and corresponding indices are such that the numerical value of 100 is assigned to a new pavement with no flaws, and zero is assigned to a highly degraded pavement. The following performance measures are routinely used to track pavement conditions:

- **Ride Index:** This is determined by using an internationally applied roughness index (IRI) in inches per mile and converting the number to a 0 to 100 scale.
- **Rut Index (RI):** This is calculated by converting rut depth to a 0 to 100 scale. Rut measurements are taken approximately every foot and averaged into one-tenth-mile reported depths.
- **Alligator Crack Index (ACI):** This is measured by combining all load-associated cracking and converting the index to a 0 to 100 scale.
- **Miscellaneous Cracking Index (MCI):** This is calculated by combining all non-load-associated cracking and converting the index into a 0 to 100 scale.
- **Overall Performance Index (OPI):** This is determined by combining and placing various weighting factors on the IRI, RI, ACI, and MCI figures and converting the index to a 0 to 100 scale. The OPI is calculated to provide a single index describing the current general health of a particular route or system.

The most important performance measure is the OPI, as this index includes all the aforementioned indices. An OPI of 80 to 100 is considered “good,” 60 to 79.9 is “fair,” and 0 to 59.9 is “poor.” As shown in **Table 2**, the various pavement condition performance measures generally indicate fair performance for the study corridor. The OPI indicates that the pavement is in fair condition. The roadway was last paved in 2012.

**Table 2: Roadway Surfacing**

Route	Surface Width	Last Surface	Flexible Thickness (feet)	IRI	RI	ACI	MCI	OPI
<b>River Drive North (RP 3.4 to RP 5.4)</b>	30	2012	0.15	67.32	77.18	97.10	99.57	<b>67.56</b>

### 2.1.2. Access and Right-of-way

The typical width of right-of-way for the study corridor is approximately 100 feet, measured 50 feet on each side of centerline. There are some spot locations with greater than 100 feet of available right-of-way.

Access along the study corridor is varied in type and density. There are multiple public and private approaches and drives. There are seven defined business approaches on the south side of the roadway between 15<sup>th</sup> Street North and 19<sup>th</sup> Street North. The approaches provide access to adjacent businesses and parking areas. Just east of 19<sup>th</sup> Street North, there is access for the Caboose Trailhead parking area on the north side of River Drive North.

The Big Stack Mobile Home Court is accessed on the south side of River Drive North between 15<sup>th</sup> Street North and 25<sup>th</sup> Street North near the top of the grade (see **Photo 1**). Also on the south side of River Drive North, and just west of 25<sup>th</sup> Street North, there is a business district with no defined access points (see **Photo 2**). The businesses front closely to the roadway which provides little room for

ingress/egress and for parking. During the field review it was noted that vehicles appear to be parking within the River Drive North right-of-way. There does not appear to be sufficient available parking near the business district outside the roadway right-of-way. There are no known easements or agreements for this de-facto parking use in place with MDT.



**Photo 1: Big Stack Mobile Home Court Access**



**Photo 2: Business District Access**

East of 25<sup>th</sup> Street North there is limited access. There are three scenic pull-outs on the north side of the roadway. There are no access points on the south side of the roadway due to the Eagle Falls Golf Club and Veteran's Memorial Park. There is one private business approach on the north side of the roadway, just west of 38<sup>th</sup> Street North.

The north gate for Malmstrom Air Force Base (AFB) is located approximately 1.5 miles east of 38<sup>th</sup> Street North at the intersection with 10<sup>th</sup> Avenue North. Traffic along River Drive North is influenced by commuter and other traffic associated with Malmstrom AFB.

There are six public roads which intersect River Drive North within the study area. These public roads range from local public roads, to principal arterials and have varying forms of intersection traffic control. **Table 3** provides a list of these intersections.

Table 3: Public Access Points

Intersection	RP	Classification	Jurisdiction	Traffic Control
15 <sup>th</sup> Street North	3.4	Principal Arterial	MDT	Signalized
19 <sup>th</sup> Street North	3.7	Local	City	Unsignalized
25 <sup>th</sup> Street North	4.3	Urban Minor Arterial	City	Unsignalized
Giant Springs Road	5.2	Urban Major Collector	City	Unsignalized
18 <sup>th</sup> Avenue North	5.3	Local	City	Unsignalized
38 <sup>th</sup> Street North	5.4	Urban Minor Arterial	City	Signalized

### 2.1.3. Drainage Conditions

There is limited information available for the location and type of drainage structures along the corridor. The existing as-built drawings did not include drainage information. There is currently curb and gutter on the west end of the corridor between 15<sup>th</sup> Street North and the Parks and Recreation approach (approximately 750 feet). The remaining portion of the corridor is uncurbed. A storm sewer pipe located under the roadway on the east side of the Caboose Trailhead was noted during the field review.

Problematic erosion is known to exist along the shoulder on the south side of River Drive North between 25<sup>th</sup> Street North and 19<sup>th</sup> Street North. The Missouri River floodplain is located on the north side of the corridor. The study area is located within the Great Falls Municipal Separate Storm Sewer System (MS4) area which may require additional drainage considerations (see **Section 3.1.3**). Further investigation and analysis of drainage conditions may be necessary during project development.

### 2.1.4. Operations

The study corridor is considered a Level I winter maintenance level according to the MDT *Maintenance Operations and Procedures Manual*.<sup>10</sup> A Level I roadway receives the highest level of maintenance and attention during inclement weather events. Level I routes are eligible to receive up to 24-hour-per-day coverage during storms. The primary objective is to keep at least one travel lane in each direction open to traffic and to provide intermittently bare pavement as soon as possible.

### 2.1.5. Other Transportation Modes

#### *Non-motorized*

The River's Edge Trail is located within the study area. The trail is a shared use path for bicyclists and pedestrians and is part of the nationally published Lewis and Clark Bicycle Trail. The trail is located north of the study corridor between 15<sup>th</sup> Street North and Giant Springs Road. At Giant Spring Road, the trail continues northeast along the Missouri River.

An additional shared use path connects to the River's Edge Trail on the east side of Giant Springs Road. This trail is located on the north side of River Drive North and connects to 38<sup>th</sup> Street North. The trail travels south along 38<sup>th</sup> Street North towards the recreational baseball



fields. There are bike lanes on both sides of the roadway east of 38<sup>th</sup> Street North. There are no non-motorized accommodations along the south side of the study corridor, nor are there any sidewalks along the corridor.

The Caboose Trailhead is located on the north side of River Drive North, just east of 19<sup>th</sup> Street North (see **Photo 3**). The trailhead provides parking and access to the River's Edge Trail. There is a trail spur that terminates at 19<sup>th</sup> Street North (see **Photo 4**). There are currently no crossing treatments at this location.



**Photo 3: Caboose Trailhead**



**Photo 4: Trail Crossing at 19th Street North**

### *Transit*

Great Falls Transit does not currently operate a route along the River Drive North corridor. The nearest route to the study corridor is the Yellow Route (Northeast Route), which passes through the intersection of 15<sup>th</sup> Street North and River Drive North. The closest stop is located at the intersection of 15<sup>th</sup> Street North and 8<sup>th</sup> Avenue North.

#### *Rail*

BNSF Railway operates rail line within the study area. There is an at-grade crossing between Giant Springs Road and 38<sup>th</sup> Street North (RP 5.25). The crossing (#098 910U) is a concrete crossing approximately 57 feet in length. The line is part of the Fort Benton branch line which runs from Fort Benton to Great Falls. The line serves the industrial and commercial areas south of River Drive North.

There are, on average, two trains per day at this crossing with a maximum train speed of 10 mph. Traffic control at the crossing currently consists of a post mounted flashing light signal with a crossbuck sign (see **Photo 5**).

#### *Freight*

The study corridor is a designated truck route and is part of the Northeast Bypass. The Northeast Bypass provides an alternate route to US Highway 87 between the intersection with 57<sup>th</sup> Street North in the southeast side of Great Falls, and the intersection with 15<sup>th</sup> Street North in the northwest. The corridor accommodates local and regional freight traffic. Within and adjacent to the study area are multiple industrial and commercial freight generators. A new industrial park is planned to be developed in the area of River Drive North and 18<sup>th</sup> Avenue North. Developments in the area are expected to serve firms reliant on goods movement by trucks and rail. The study corridor currently experiences approximately 7.2 percent heavy vehicle traffic (see **Section 2.2.1**).

#### *Air Service*

The Great Falls International Airport serves the greater community. The airport is located approximately seven miles from the study corridor at the Gore Hill Interchange off Interstate 15. Due to the location of the airport, the study corridor is likely not directly influenced by the airport.

#### 2.1.6. Utilities

Electric power and natural gas utilities are provided by Northwestern Energy. CenturyLink provides telecommunication services to the study area. Overhead power is located along the south side of the roadway beginning just east of 25<sup>th</sup> Street North. The overhead power crosses the roadway at two locations, both near the Veteran's Memorial Park. Street lights are present between 15<sup>th</sup> Street North and the Big Stack



**Photo 5: Existing Traffic Control at the Railroad Crossing**

Mobile Home Court. Street lighting is also in place at the intersection with 25<sup>th</sup> Street North, at the scenic pullout, and at the intersection with 38<sup>th</sup> Street North.

## 2.2. TRAFFIC OPERATIONS

An evaluation of traffic operations for the study corridor was completed using available data provided by MDT, as well as field-collected data. Turning-movement counts were conducted at the three major intersections within the study area over a 24-hour period. Mainline traffic volume data for existing and historic conditions were available at multiple locations within the study area. Visual observations were made for driver behavior, vehicle queuing and general traffic characteristics. The following sections provide details about the existing and projected traffic characteristics for the study corridor. Detailed data is included in the appendix.

### 2.2.1. Traffic Volumes

Traffic volumes along the roadways within the study area are collected annually as part of MDT's traffic data collection program. A total of 10 data collection sites are located within the study area. Of these 10 sites, three are located directly along the study corridor. The remaining seven sites are located adjacent to the study corridor.

The data collected at these sites is used to determine an average annual daily traffic (AADT) volume. AADT represents the average number of vehicles that pass a given point on a typical day of the year. Existing AADT volumes on the study corridor ranged from a low of 10,770 vehicle per day (vpd) east of Giant Springs Road, to a high of 14,400 vpd west of 25<sup>th</sup> Street North.

#### *Projected Conditions*

Projected transportation conditions were analyzed to estimate how traffic volumes and characteristics may change compared to existing conditions. The analysis was based on known existing conditions projected out 20 years, to the year 2035. Future projections were made using estimated growth for the study area. The location, type, and design of land use developments ultimately impacts the existing and future transportation system.

The future growth rate was estimated by comparing three different projection methods: historic traffic growth, transportation demand model (TDM) of a "no action" scenario, and TDM of an "expanded capacity" model. Each method resulted in a different growth rate for both the study area and the study corridor. These values were then compared and a final growth rate was determined.

The historic traffic growth method utilized the historic AADT data available from MDT. AADT data from the past 20 years (1995 through 2014) were used to determine an average annual growth rate (AGR) for the count sites within the study area. It was found that for the study area, the AAGR is 1.48 percent over the past 20 years. For the study corridor itself, the AAGR is 1.88 percent.

The second projection method used the TDM under a "no action" scenario. This scenario assumes that the transportation network will remain the same for the next 20 years. The existing traffic volumes, along with housing and employment projections, were entered into the



TDM and future traffic volumes were output. One consideration for this model is that the study corridor is shown to be at, or exceeding, assigned capacity values for a two-lane roadway. As such, future traffic demand is more likely to use alternate routes to the study corridor due to capacity constraints. This rerouting of traffic results in a lower growth rate than future demand might project. The AAGR for this method is 1.06 percent for the study area, and 0.93 percent for the study corridor.

The third method also utilized the TDM. Unlike the second method, however, the capacity along the study corridor was increased to remove the capacity constraints. This method is the method most likely to predict the true demand for the corridor, given no constraints for roadway capacity. This method resulted in an AAGR of 1.40 percent for the study area, and 1.48 percent for the study corridor.

Given the three traffic projection methods, an AAGR of 1.50 percent was selected for the study corridor. This growth rate was applied to the existing traffic volume data discussed previously. The existing AADT and resulting projected AADT values for the year 2035 are shown in **Table 4**.

**Table 4: Existing and Projected AADT**

Location		2014 AADT	2035 AADT <sup>(i)</sup>
<b>ALONG STUDY CORRIDOR</b>			
River Drive North	West of 25 <sup>th</sup> Street North	14,400	19,690
River Drive North	West of Giant Springs Road	12,583	17,200
River Drive North	East of Giant Springs Road	10,770	14,720
<b>ADJACENT TO STUDY CORRIDOR</b>			
River Drive North	East of 10 <sup>th</sup> Street North	12,336	16,860
River Drive North	East of 38 <sup>th</sup> Street North	8,941	12,220
25 <sup>th</sup> Street North	South of River Drive North	5,339	7,300
38 <sup>th</sup> Street North	South of River Drive North	5,603	7,660
Giant Springs Road	North of River Drive North	1,170	1,600
15 <sup>th</sup> Street North	South of River Drive North	11,470	15,680
15 <sup>th</sup> Street North	North of River Drive North	15,650	21,390

<sup>(i)</sup> Projected AADT based on an assumed growth rate of 1.50% per year.

### *Heavy Vehicle Traffic*

An analysis of heavy vehicle traffic along the study corridor was made using the 24-hour turning movement count data. The turning movement count data includes breakouts for vehicle types. For this analysis, vehicles classified as single-unit trucks and articulated trucks

were considered heavy vehicles. Based on the turning movement counts, heavy vehicles account for approximately 7.2 percent of all vehicles along the study corridor.

### 2.2.2. Major Intersections

Traffic volume data was supplied by MDT for the intersections of River Drive North with 15<sup>th</sup> Street North, 25<sup>th</sup> Street North, and 38<sup>th</sup> Street North. The turning movement counts were performed on August 17<sup>th</sup>, 2015 at 15<sup>th</sup> Street North and on September 21<sup>st</sup>, 2015 at 25<sup>th</sup> Street North and at 38<sup>th</sup> Street North. Each turning movement count was adjusted based on seasonal traffic adjustment factors published by MDT<sup>11</sup>. The following sections discuss the traffic operations at the three major intersections. **Figures 2** and **3** provides graphical summaries of the existing and projected traffic conditions for the study area. The results of the intersection operational analysis are shown in **Table 5**.

#### *15<sup>th</sup> Street North*

The intersection of River Drive North and 15<sup>th</sup> Street North is currently signalized. The eastbound and westbound approaches consist of dedicated right-turn, through, and left-turn lanes. The northbound approach consists of a dedicated left-turn bay, one dedicated through lane, and a shared through/right-turn lane. The southbound approach consists of a shared through/right-turn and a shared through/left-turn lane.

During field observations it was noted that large trucks had difficulty making turns at this intersection, particularly right-turns from the westbound approach. The southbound approach is constrained by the limited width of the bridge directly to the north of the intersection. This results in sharp corners that force large trucks to turn into the outside lane.

The signal is operated using split phasing for the northbound and southbound directions (i.e. southbound and northbound movements receive green time separately from each other) due to the current lane configurations. A left-turn phase study was completed by MDT on January 13, 2011. The purpose of the study was to explore the implementation of an east/west protected-permissive left-turn phase. The study determined that modifying the traffic signal to include protected-permissive left-turn phasing was not warranted at the time.

Under existing traffic conditions, this intersection operates at a Level of Service (LOS) of D, C and C during the AM, noon, and PM peak hours, respectively. Under projected conditions, the intersection is shown to operate at a LOS of E, C and E during the respective peak hours.

#### *25<sup>th</sup> Street North*

The intersection of River Drive North and 25<sup>th</sup> Street North is a three-legged intersection. The northbound approach consists of a right-turn slip lane with yield control and a dedicated left-turn lane with stop control. The eastbound approach consists of a free-flowing through lane and a yield controlled right-turn slip lane. The westbound approach consists of a dedicated left-turn bay and a free flowing through lane.

An intersection signal warrant analysis was completed on January 13, 2015. The purpose of the analysis was to evaluate installation of a traffic signal or roundabout to accommodate existing traffic. The analysis noted that a higher form of traffic control could be necessary to

accommodate northbound left-turning vehicles. Existing issues, such as steep roadway grades, construction constraints, and the desire to maintain the bypass characteristics of River Drive North, were noted as challenges which may inhibit installation of a traffic signal or roundabout. The analysis recommended that the entire River Drive North corridor be evaluated for a long-term solution.

Under existing traffic conditions, the intersection operates at a LOS of D, C and F during the AM, noon, and PM peak hours, respectively. Under projected traffic conditions, the intersection operates at a LOS of F during all peak hours.

### 38<sup>th</sup> Street North

The intersection of River Drive North and 38<sup>th</sup> Street North is a four-legged signalized intersection. The northbound, eastbound, and westbound approaches each consist of a dedicated left-turn bay and a shared through/right-turn lane. The southbound leg of the intersection is an access to a local business.

The intersection is shown to operate at a LOS of A during the existing peak hours. Under projected conditions, the intersection operates at a LOS of B, A and B during the AM, noon, and PM peak hours, respectively.

**Table 5: Intersection Operations Analysis**

Intersection	Existing Conditions (2015)						Projected Conditions (2035)					
	AM		Noon		PM		AM		Noon		PM	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
<b>15<sup>th</sup> Street North</b>	<b>37.5</b>	<b>D</b>	<b>21.2</b>	<b>C</b>	<b>31.3</b>	<b>C</b>	<b>58.7</b>	<b>E</b>	<b>34.1</b>	<b>C</b>	<b>58.3</b>	<b>E</b>
Eastbound	22.4	C	20.5	C	24.2	C	35.4	D	25.3	C	33.8	C
Westbound	12.9	B	14.4	B	17.6	B	15.3	B	17.0	B	24.0	C
Northbound	30.5	C	24.6	C	36.5	D	48.9	D	39.3	D	66.5	E
Southbound	68.4	E	24.8	C	49.1	D	109.1	F	52.3	D	113.2	F
<b>25<sup>th</sup> Street North</b>	<b>31.4</b>	<b>D</b>	<b>23.5</b>	<b>C</b>	<b>92.7</b>	<b>F</b>	<b>73.8</b>	<b>F</b>	<b>65.9</b>	<b>F</b>	<b>517.9</b>	<b>F</b>
Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Westbound	0.6	A	1.1	A	0.7	A	0.6	A	1.1	A	0.8	A
Northbound	25.9	D	20.1	C	75.1	F	56.4	F	51.0	F	407.8	F
<b>38<sup>th</sup> Street North</b>	<b>8.6</b>	<b>A</b>	<b>6.7</b>	<b>A</b>	<b>8.3</b>	<b>A</b>	<b>11.3</b>	<b>B</b>	<b>7.5</b>	<b>A</b>	<b>11.7</b>	<b>B</b>
Eastbound	8.0	A	6.4	A	7.6	A	11.3	B	6.8	A	11.0	B
Westbound	5.2	A	5.5	A	7.1	A	5.6	A	5.6	A	9.5	A
Northbound	13.4	B	9.7	A	13.5	B	16.7	B	13.1	B	19.2	B
Southbound	0.0	A	8.8	A	11.3	B	0.0	A	11.5	B	15.3	B

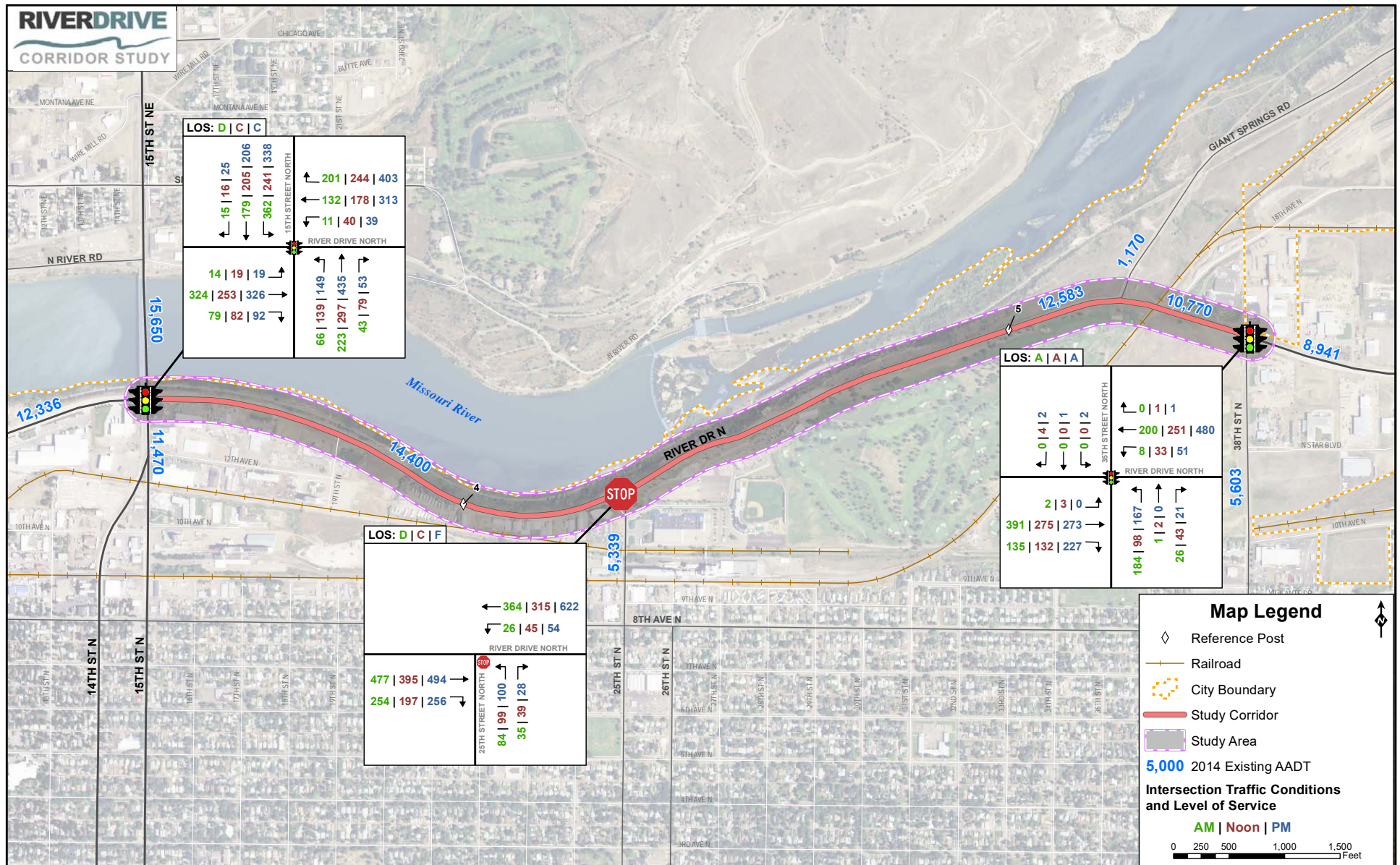


Figure 2: Existing Traffic Conditions



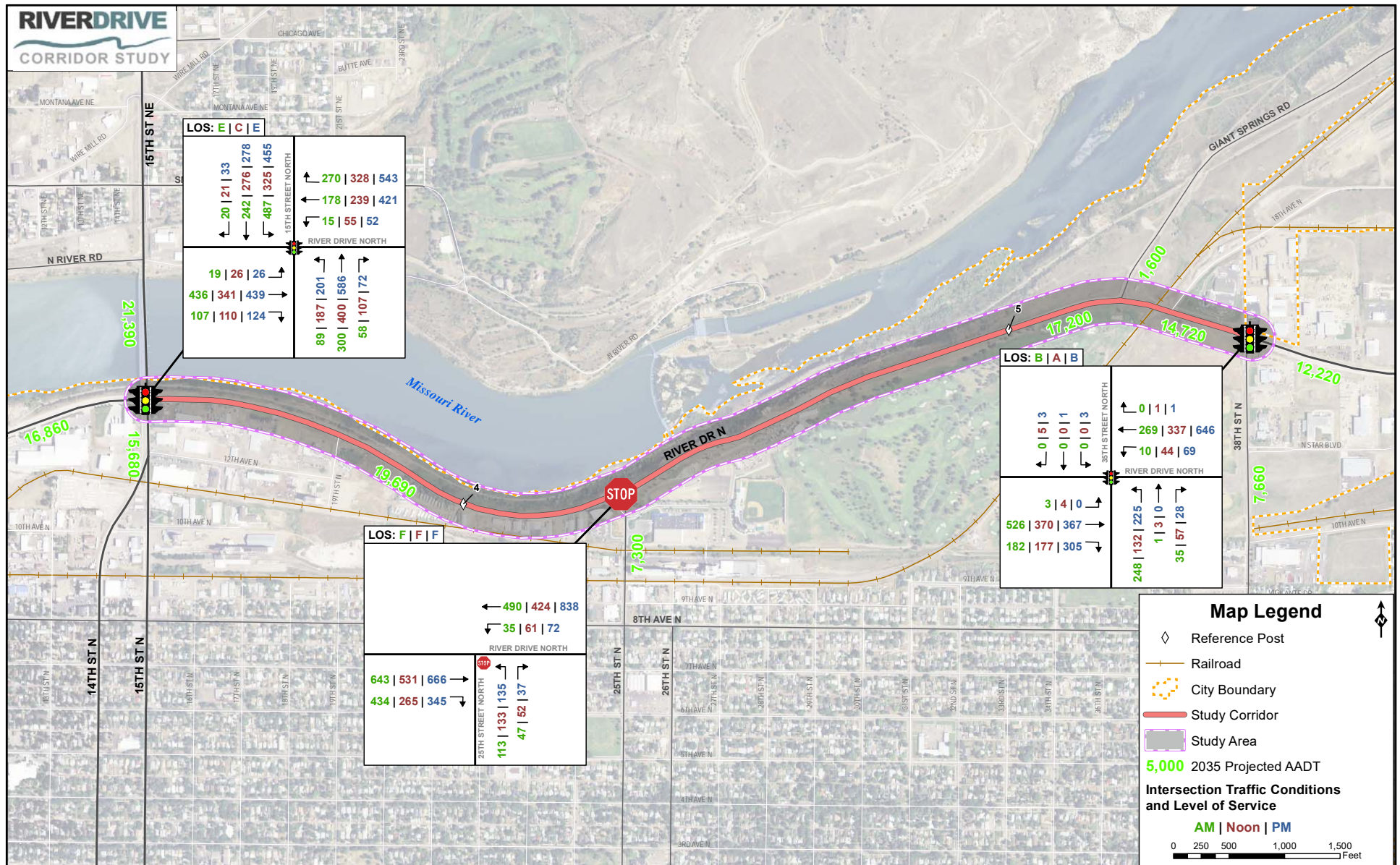


Figure 3: Projected Traffic Conditions

## 2.3. GEOMETRIC CONDITIONS

Existing roadway geometrics were evaluated and compared to current MDT standards. The analysis was conducted based on a review of public information, MDT as-built drawings, GIS data, and field observations. As-built drawings containing horizontal geometrics were reviewed for the study corridor. Vertical profiles were not available as part of the as-built drawings. Planning level mapping was completed for the *River Drive North Feasibility Study* and was used to approximate vertical profile information.

### 2.3.1. Design Criteria

The MDT *Road Design Manual*<sup>12</sup> specifies general design principles and controls that determine the overall operational characteristics of the roadway and enhance its aesthetic appearance. The geometric design criteria for the study corridor are based on the current MDT design criteria for an “Urban Principal Arterial (NHS Non-Interstate)” roadway.

The NHS is a system of highways determined to have the greatest national importance to transportation, commerce and defense. Arterial roadways are characterized by a capacity to move relatively large volumes of traffic quickly and a restricted-access-point function to serve adjoining properties. In both rural and urban areas, the principal arterials provide the highest traffic volumes and the greatest trip lengths.

**Table 6** lists the current design standards for the study corridor according to MDT design criteria.

The design speed for an urban principal arterial roadway ranges between 40 and 45 mph where curbing is present, and 40 to 50 mph for an uncurbed roadway. Note that a facility’s design speed and its operating speed differ. The design speed is a selected speed used to determine the various geometric design features of the roadway. The operating speed is the highest overall speed at which a driver can travel on a given section of roadway under favorable weather conditions and under prevailing traffic conditions without at any time exceeding the safe speed as determined by the design speed.

Some design standards vary based on terrain. MDT’s *Road Design Manual* contains the following definitions for each terrain type:

- **Level Terrain** – The available stopping sight distances are generally long or can be made to be so without construction difficulty or major expense.
- **Rolling Terrain** – The natural slopes consistently fall below and rise above the roadway and occasional steep slopes offer some restriction to horizontal and vertical alignment.
- **Mountainous Terrain** – Longitudinal and traverse changes in elevation are abrupt and extensive grading is frequently needed to obtain acceptable alignments.

Based on these definitions, most of the study area appears to be level terrain with some areas of rolling terrain. A determination of design speed and terrain type for the corridor was not made as part of this evaluation. Rather, those areas that do not meet standards for the minimum design speed (40 mph) and criteria for level terrain as listed in **Table 6** were considered areas of concern. Further evaluation of design speed and terrain type may be necessary during the project development process.

Table 6: Geometric Design Criteria (Urban Principal Arterial)

Design Element			Manual Section	2-lane		
				Curbed	Uncurbed	
Design Controls	Design Forecast Year (Geometrics)		8.4	20 years		
	Design Speed <sup>(i)</sup>		8.3	40 – 45 mph	40 – 50 mph	
	Level of Service		8.4	Desirable: B Minimum: C		
Roadway Elements	Travel Lane Width <sup>(i)</sup>		11.2	12'		
	Shoulder Width <sup>(i)</sup>	Outside	11.2	Varies		
		Inside		N/A		
	Cross Slope	Travel Lane <sup>(i)</sup>	11.2	2% Typical	2%	
		Shoulder		2% Typical	2%	
	Median Width		11.3	N/A		
TWLTL Width		11.2	16'			
Earth Cut Section	Ditch	Inslope	11.4	N/A	6:1 Desirable; 4:1 Minimum	
		Width		N/A	10' Min.	
		Slope		N/A	20:1 towards back slope	
	Back Slope; Cut Depth at Slope Stake	0' – 5'	11.4	5:1		
		5' – 10'		Level/rolling: 4:1; Mountainous: 3:1		
		10' – 15'		Level/rolling: 3:1; Mountainous: 2:1		
		15' – 20'		Level/rolling: 2:1; Mountainous: 1.5:1		
		> 20'		1.5:1		
Earth Fill Slopes	Fill Height at Slope Stake	0' – 10'	11.4	6:1	6:1	
		10' – 20'		4:1	4:1	
		20' – 30'		3:1	3:1	
		> 30'		2:1	2:1	
Alignment Elements	DESIGN SPEED			40 mph	45 mph	50 mph
	Stopping Sight Distance <sup>(i)</sup>		8.6	305'	360'	425'
	Minimum Radius <sup>(i)</sup>		9.2	533'	711'	760'
	Superelevation Rate <sup>(i)</sup>		9.3 & 9.4	e <sub>max</sub> = 4.0%		e <sub>max</sub> = 8.0%
	Vertical Curvature <sup>(i)</sup>	Crest	10.5	44	61	84
		Sag		64	79	96
	Maximum Grade <sup>(i)</sup>	Level	10.3	6%	6%	6%
		Rolling		7%	7%	7%
		Mountainous		9%	9%	9%
Minimum Vertical Clearance <sup>(i)</sup>		10.6	17'			

<sup>(i)</sup> Controlling design criteria

Source: MDT Road Design Manual, Figure 12-7, Geometric Design Criteria for Urban Principal Arterials



### 2.3.2. Horizontal Alignment

Elements comprising horizontal alignment include curvature, superelevation, and sight distance. These horizontal alignment elements influence traffic operation and safety and are directly related to the design speed of the corridor. MDT's standards for horizontal curves are defined in terms of curve radius, stopping sight distance, and superelevation rate. For a 40 mph design speed, the minimum standards for curve radius, stopping sight distance, and superelevation rate are 533 feet, 305 feet, and 4.0 percent, respectively. **Table 6** provides the recommended standards contained in the MDT *Road Design Manual*.

Horizontal curve radius was determined based on as-built drawings provided by MDT. According to the as-built drawings, eight horizontal curves exist along the study corridor. All eight horizontal curves appear to meet current 40 mph design standards based on curve radius and sight distance. Superelevation rates were unavailable, so it is unknown at this time whether the curves meet standards for maximum superelevation rates. **Table 7** provides a summary of the horizontal curves found along the study corridor.

**Table 7: Horizontal Curve Design Information**

Location (RP)	Radius (ft)	Length (ft)	Superelevation	Min. Sight Obstruction (ft) <sup>(i)</sup>	Design Speed Met (mph)	Meets Standards	Comments
<b>3.53</b>	1,910	471.9	UNKNOWN	8.5	45	YES	Curbed segment
<b>3.74</b>	4,000	1,329.7	UNKNOWN	5.6	50	YES	
<b>4.07</b>	1,640	1,561.5	UNKNOWN	13.7	50	YES	
<b>4.27</b>	600	108.9	UNKNOWN	19.3	40	YES	
<b>4.41</b>	1,100	307.5	UNKNOWN	20.5	50	YES	
<b>4.48</b>	1,200	234.2	UNKNOWN	18.8	50	YES	
<b>4.69</b>	4,500	581.9	UNKNOWN	5.0	50	YES	
<b>5.16</b>	1,433	947.8	UNKNOWN	15.7	50	YES	

<sup>(i)</sup> Minimum sight obstruction distance calculated based on design speed met.

### 2.3.3. Vertical Alignment

Vertical alignment is a measure of elevation change of a roadway. The length and steepness of grades directly affect the operational characteristics of the roadway. The MDT *Road Design Manual* lists recommendations for vertical alignment elements such as grade, rate of vertical curvature (K-value), and stopping sight distance. Recommendations are made based on roadway design speed and terrain type. These recommendations are shown in **Table 6**.

According to the *Road Design Manual*, the maximum allowable grades are six percent for level terrain, seven percent for rolling terrain, and nine percent for mountainous terrain. For vertical curves, stopping sight distance, and K-values are controlling design criteria. K-values are

defined as a function of the length of the curve compared to the algebraic change in grade, which comprises either a sag or a crest vertical curve. For a 40 mph design speed, minimum k-values of 44 and 64 are recommended for crest and sag vertical curves, respectively.

As-built vertical profile information was unavailable for the study corridor. Instead, planning level mapping completed for the *River Drive North Feasibility Study* was used to approximate vertical profile information. According to the planning level mapping, there are 14 vertical curves along the study corridor. Of the 14 vertical curves, two do not appear to meet standards based on rate of curvature (K-value). In addition, the grade between approximately RP 3.87 and RP 4.01 exceeds standards for level terrain. **Table 8** provides a list of vertical curve information as obtained from the planning level mapping.

**Table 8: Vertical Curve Design Information**

Location (RP)	Curve Type	Length (ft)	Grade Back	Grade Ahead	K-value	Design Speed Met (mph)	Meets Standards	Comments
3.49	SAG	200.0	1.1%	0.6%	399.2	45	YES	Curbed segment
3.59	CREST	100.0	0.6%	-1.4%	51.5	40	YES	
3.62	SAG	100.0	-1.4%	0.6%	50.5	35	NO	Does not meet current standards based on rate of curvature.
3.67	CREST	500.0	0.6%	-2.0%	188.5	50	YES	
3.87	SAG	700.0	-2.0%	6.8%	78.8	40	NO	Does not meet current standards for level terrain based on grade.
4.01	CREST	400.0	6.8%	1.9%	81.0	45	NO	Does not meet current standards for level terrain based on grade.
4.10	SAG	550.0	1.9%	3.5%	336.6	50	YES	
4.26	CREST	400.0	3.5%	-1.4%	80.7	45	YES	
4.45	SAG	800.0	-1.4%	2.0%	237.7	50	YES	
4.60	CREST	490.0	2.0%	-1.2%	154.8	50	YES	
4.70	SAG	200.0	-1.2%	-0.1%	185.0	50	YES	
4.87	CREST	380.0	-0.1%	-1.5%	283.8	50	YES	
5.25	SAG	297.0	-1.5%	3.5%	59.3	35	NO	Does not meet current standards based on rate of curvature.
5.34	CREST	480.0	3.5%	1.7%	263.6	50	YES	

### 2.3.4. Roadside Clear Zone

The roadside clear zone, starting at the edge of the traveled way, is the total roadside border area available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a recovery area. The desired clear zone width varies depending on traffic volumes, speeds and roadside geometry. Clear zones are evaluated individually based on the roadside cross section. According to MDT, clear zone should be attained by removing or shielding obstacles, if costs are reasonable.

In certain instances within the study area, it may be impractical to protect or remove certain obstacles within the clear zone. As improvement options develop, roadside clear zones should be designated, to a practical extent, to meet current MDT design standards.

## 2.4. SAFETY

Historic crash data was provided by the MDT Traffic and Safety Bureau for the study area for the five year period from January 1<sup>st</sup>, 2010 to December 31<sup>st</sup>, 2014. A total of 113 crashes were reported to have occurred within the study area during the crash analysis period. The following subsections provide detailed analyses of the crash data.

### 2.4.1. Crash Location

Crash data for the period of record were evaluated based on location. The crashes were plotted based on GPS coordinates contained in the crash records. **Figure 4** shows the locations and clusters of reported crashes over the analysis period. The following were noted as crash cluster locations:

- **15<sup>th</sup> Street North Intersection**: A total of 41 crashes occurred at the intersection with 15<sup>th</sup> Street North. Of these crashes, 39 involved multiple vehicles. There were 16 rear-end crashes and 11 right angle crashes. The remaining crash types at this intersection include fixed object, head on, left turn, right turn, backing vehicle, and sideswipe crashes. There were three crashes which resulted in a non-incapacitating injury and eight resulting in a possible injury. The remaining crashes at this intersection resulted in property damage only.
- **East of 15<sup>th</sup> Street North**: A total of six crashes were reported near the entrances to the businesses east of 15<sup>th</sup> Street North. Four crashes were rear-ends, one was a fixed object, and the sixth crash was reported as other. Two of the rear-end crashes resulted in possible injuries, while the remaining crashes were property damage only.
- **Big Stack Mobile Home Court**: There were 19 reported crashes at the entrance to the Big Stack Mobile Home Court, 17 of which involved multiple vehicles. Of the 19 crashes, 12 were rear-ends, three were left turn crashes, one was a fixed object collision, one involved a wild animal, one was a right angle crash, and one was listed as "other". Eighteen of the reported crashes occurred during daylight conditions, while the 19<sup>th</sup> occurred during dusk. Four of the reported crashes resulted in possible injuries and one crash was reported as a non-incapacitating injury.

- **25<sup>th</sup> Street North Intersection**: Eleven crashes were reported at the intersection with 25<sup>th</sup> Street North. Nine of the crashes involved multiple vehicles. The crash types included five rear-ends, three right angles, one left turn, one roll over, and one pedestrian related crash. All 11 crashes occurred on dry surface condition.
- **Scenic Pullout**: Seven crashes were reported near the scenic pullout overlooking Black Eagle Falls. Two of the crashes were rear-end crashes, three were fixed object collisions, and two were wild animal related. One rear-end resulted in an incapacitating injury, while the remaining six crashes resulted in property damage only. Two crashes occurred under daylight, three under dark-lighted, one under dark-not lighted, and one under dusk lighting conditions. The weather was reported as clear for all but one crash which was listed as cloudy.
- **Giant Springs Road Intersection**: Seven crashes were reported at the intersection of Giant Springs Road. Two of the crashes involved multiple vehicles and were reported as left turn crashes. The remaining include two wild animal related and three fixed object crashes. One left turn crash resulted in an incapacitating injury and one of the fixed object crashes resulted in a non-incapacitating injury. The remaining five crashes were reported as property damage only crashes.
- **Railroad Crossing**: Four crashes were reported in the vicinity of the railroad crossing between Giant Springs Road and 18<sup>th</sup> Avenue North. All of the crashes resulted in property damage only. Two crashes were rear-end and the other two were wild animal related.
- **38<sup>th</sup> Street North Intersection**: Five crashes were reported at the 38<sup>th</sup> Street North intersection. All five crashes were rear-end crashes. Three resulted in property damage only and the other two were reported as a possible injury and a non-incapacitating injury. All of the crashes occurred during the daylight. The roadway conditions were reported as one wet, one dry, one snow covered, and three unknown.



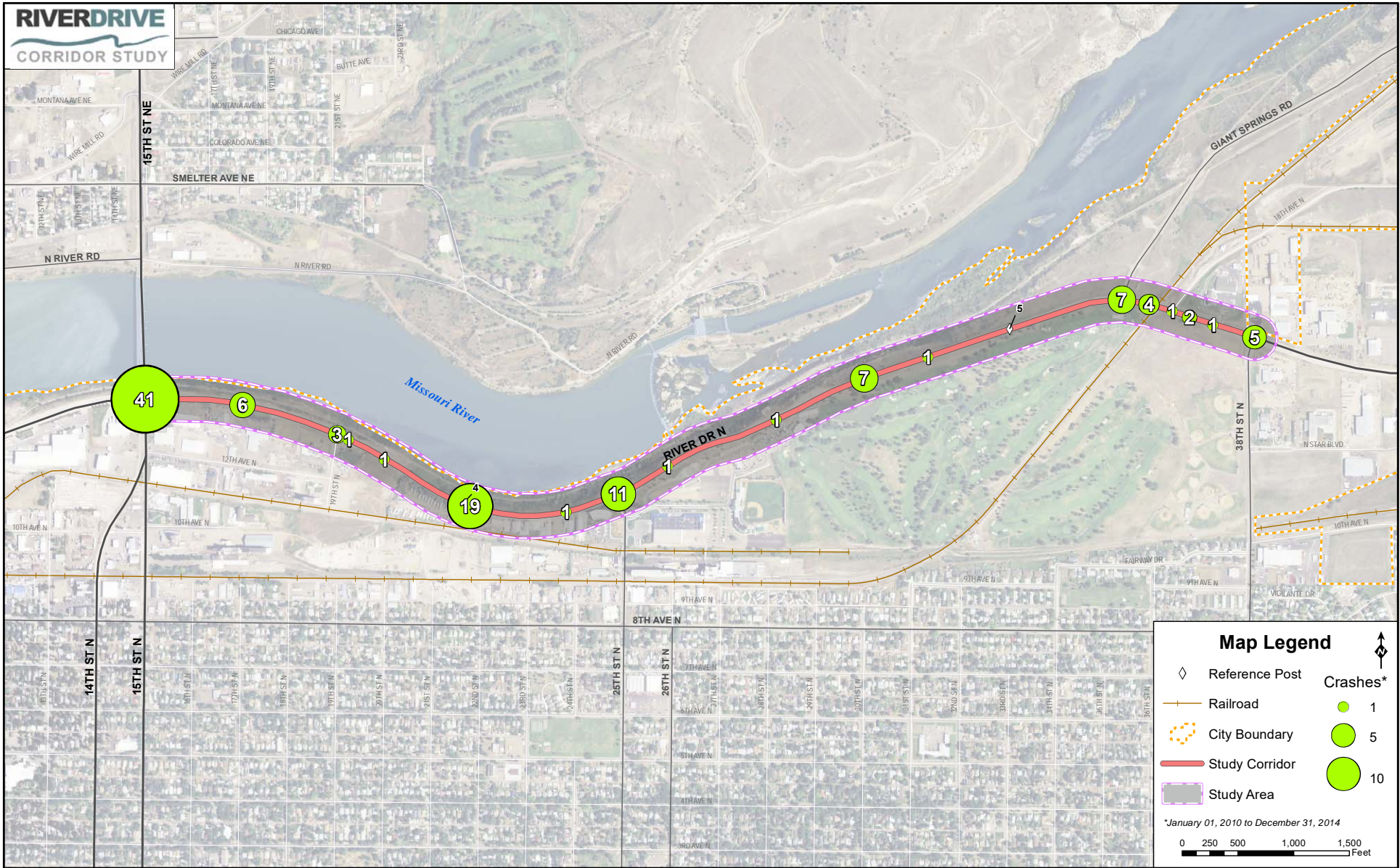


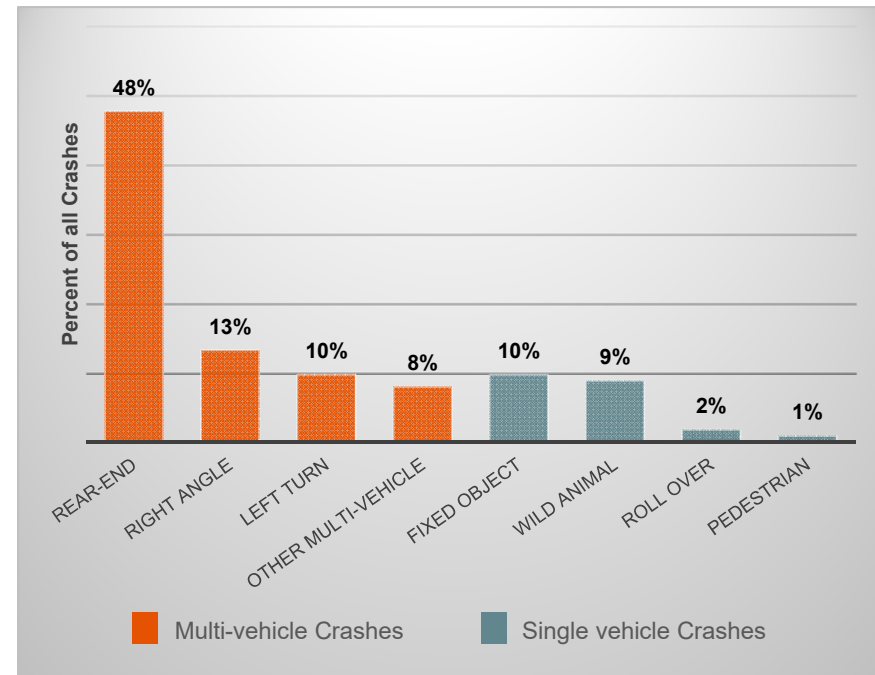
Figure 4: Crash Locations

### 2.4.1. Crash Type

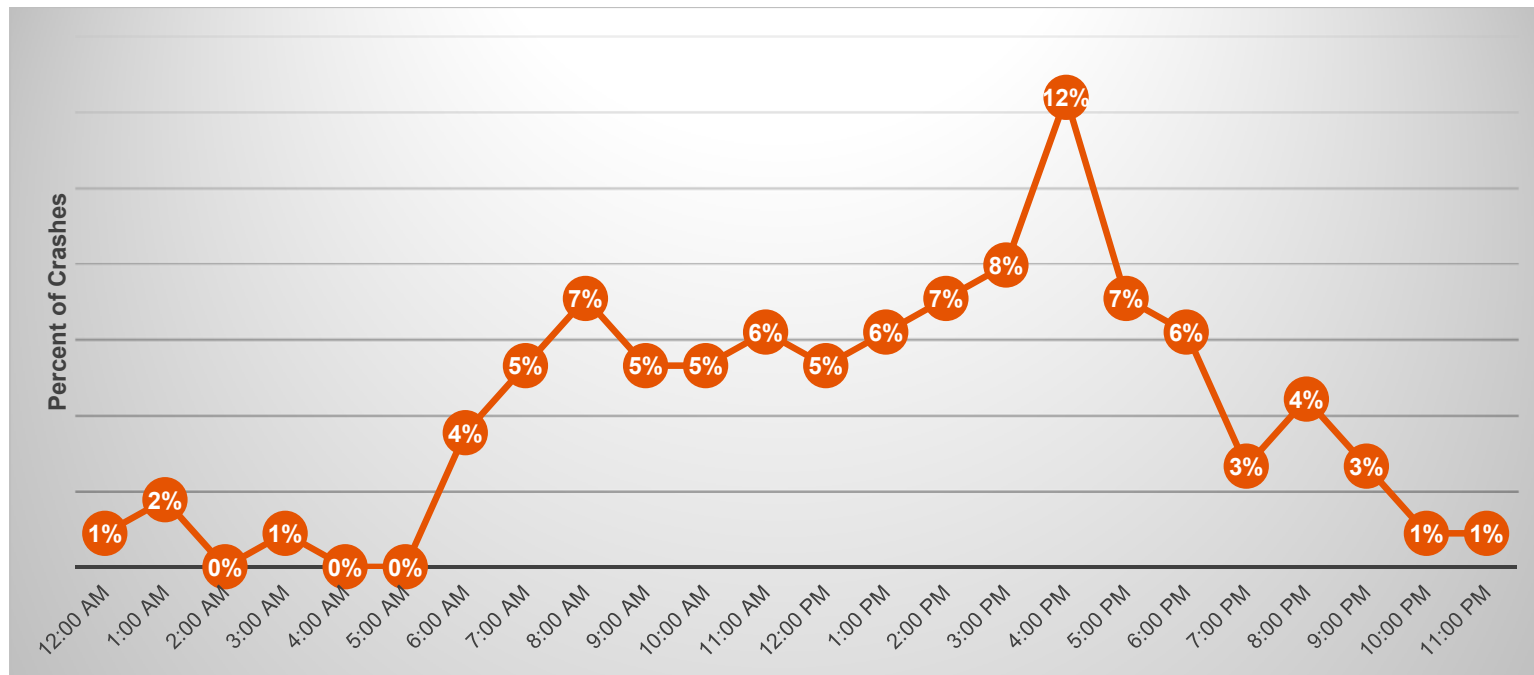
The crash type, or manner of crash, was reported for each crash. Crash types can be grouped into two categories, multi- and single vehicle crashes. Multi-vehicle crashes are crashes that involve two or more vehicles, single vehicle crashes involve only one vehicle. Multi-vehicle crashes accounted for 79 percent of all crashes. Single vehicle crashes accounted for the remaining 21 percent. The most common crash type was rear-end crashes, accounting for 48 percent of all reported crashes. The most commonly single vehicle crash was fixed object crashes, accounting for 10 percent of total crashes. **Figure 5** presents the distribution of crashes based on crash type.

### 2.4.2. Temporal Analysis

Each crash record contains the date and time of the crash. The data was inspected to determine if any temporal patterns could be identified. With respect to the time-of-day in which crashes occurred, crashes occurring between 4:00 and 5:00 PM accounted for 12 percent of all crashes. **Figure 6** depicts the distribution of crashes based on time-of-day.



**Figure 5: Crash Type Statistics**



**Figure 6: Time-of-day Crash Statistics**

Both the day of the week and the month of the year in which crashes occurred were analyzed. Analysis of the day of the week data showed that the most common day for crashes was Monday, accounting for 22 percent of total crashes. Crashes occurring on Saturday and Sunday accounted for 12 and 4 percent of crashes, respectively. Data regarding the month of the year in which crashes occurred showed that October had the most crashes, accounting for 14 percent of total crashes. April had the fewest crashes, accounting for 3 percent of all crashes. The winter months, November through February, accounted for a combined 34 percent of all crashes. **Figure 7** shows the distribution of crashes with respect to the day of the week and the month of the year in which the crashes occurred.



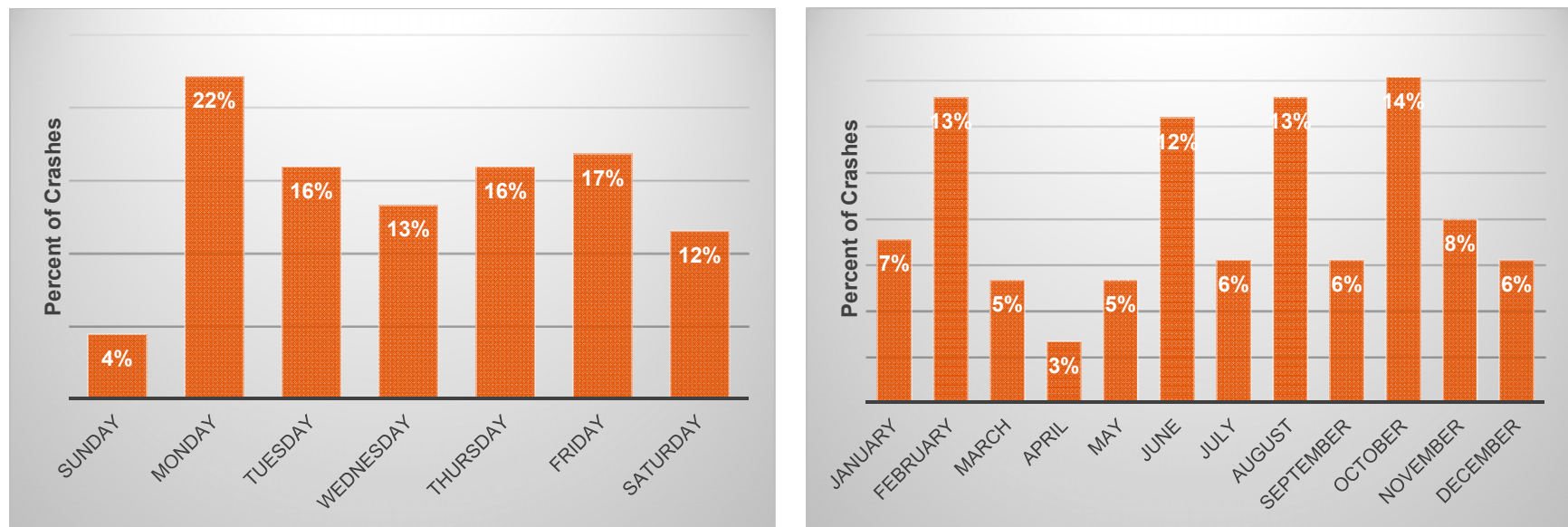


Figure 7: Day of Week and Month of Year Crash Statistics

#### 2.4.3. Crash Severity

Crash severity is reported based on the worst injury that occurred during the crash. For example, if there are three individuals involved in a crash and two are uninjured and the third has a non-incapacitating evident injury, the crash would be reported as a non-incapacitating injury crash. Crash severity can be defined as non-injury, property damage only (PDO); possible injury; non-incapacitating, evident injury, incapacitating injury; or fatal injury. An incapacitating injury is defined as an injury, other than a fatality, which prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before injury. During the analysis period, there no reported fatal injury crashes, two incapacitating injury crashes, and six non-incapacitating injury crashes.

#### 2.4.4. Driver's Age and Gender

Reported with each crash is the age and gender of each individual involved in the crash. Additionally, drivers and passengers are identified separately. A total of 216 drivers were involved in crashes within the study area during the crash analysis time period. Males accounted for 65 percent of all drivers, females accounted for 32 percent of drivers, and the gender of the remaining three percent was not listed. With respect to the driver's age, the 21 to 25 years of age group accounted for 18 percent of drivers. The 16 to 20 years of age group had the second most drivers with 10 percent of drivers.

### 2.4.5. Environmental Conditions

Three environmental conditions are reported on each crash record: weather, road, and lighting conditions. It was found that 65 percent of crashes occurred under clear weather conditions, 65 percent occurred on dry roads, and 80 percent occurred during daylight conditions. **Table 9** shows the relationship between the three environmental conditions.

### 2.4.6. Crash Rates

**Table 10** provides a comparison of the crash rate, crash severity index, and crash severity rate within the study area. Crash rates are defined as the number of crashes per million vehicle miles of travel (for intersections, the crash rate is the number of crashes per million vehicles entering the intersection per year). The crash severity index is the ratio of the sum of the level of crash degree to the total number of crashes. Crash severity rate is determined by multiplying the crash rate and the crash severity index.

**Table 9: Environmental Crash Statistics**

Road Condition <i>Lighting Condition</i>	Number of Crashes					
	Weather Condition					Total
	Clear	Cloudy	Snow	Rain	Other	
Dry	60	14				74
Daylight	50	9				59
Dark-Lighted	6	2				8
Dusk/Dawn	3	3				6
Dark-Not Lighted	1					1
Wet	1	4	1	3		9
Daylight	1	4	1	2		8
Dark-Lighted				1		1
Snow		2	5			7
Daylight		2	3			5
Dark-Lighted			1			1
Dusk/Dawn			1			1
Ice/Frost	1		1		3	5
Daylight	1		1		2	4
Dark-Lighted					1	1
Unknown	11	5	1		1	18
Daylight	9	3	1		1	14
Dark-Lighted	2	2				4
Grand Total	73	25	8	3	4	113

**Table 10: Crash Rate and Severity Statistics**

Location	# Fatal/Incap	# Injury	#PDO	AADT 3-year Average	Crash Rate	Severity Index	Severity Rate
<b>SEGMENTS</b>							
<b>15<sup>th</sup> Street North – 25<sup>th</sup> Street North</b>	0	9	22	15,503	1.25	1.58	1.97
<b>25<sup>th</sup> Street North – 38<sup>th</sup> Street North</b>	2	3	20	11,991	0.99	1.80	1.78
<b>MAJOR INTERSECTIONS</b>							
<b>15<sup>th</sup> Street North</b>	0	11	30	27,266	0.81	1.54	1.24
<b>25<sup>th</sup> Street North</b>	0	4	7	16,311	0.36	1.73	0.63
<b>38<sup>th</sup> Street North</b>	0	2	3	12,276	0.22	1.80	0.39

### 3.0. ENVIRONMENTAL SETTING

This section provides a summary of the *Environmental Scan*<sup>13</sup> developed by MDT. The primary objective of the *Environmental Scan* is to provide a planning-level overview of resources and to determine potential constraints and opportunities within the study area. As a planning-level scan, the information was obtained from various publicly available reports, websites, and other documentation, as well as a “windshield survey” conducted by MDT staff. This scan is not a detailed environmental investigation. Refer to the MDT *Environmental Scan* for more detailed information.

If improvement options are forwarded from this study into project development, an analysis for compliance with the National and Montana Environmental Policy Acts (NEPA and MEPA) will be completed as part of the project development process. Information provided in the *Environmental Scan* may be included in the NEPA/MEPA process at that time.

#### 3.1. PHYSICAL ENVIRONMENT

The following subsections present an overview of items related to the physical environment.

##### 3.1.1. Soil Resources and Prime Farmland

Information obtained on soils is used to determine the presence of prime and unique farmland in the study area to demonstrate compliance with the Farmland Protection Policy Act (FPPA). Farmland includes prime farmland, some prime if irrigated farmland, unique farmland, and farmland (other than prime or unique farmland) that is of statewide or local importance. Prime farmland soils are those that have the best combination of physical and chemical characteristics for producing food, feed, and forage; the area must also be available for these uses. Prime farmland can be either non-irrigated or lands that would be considered prime if irrigated. Farmland of statewide importance is defined as follows: land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crops.

Soil surveys of the study area are available from the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). NRCS indicates that farmland of statewide importance is present within the study area. There is land designated as having statewide importance on the south side of the study area between approximately RP 3.4 to RP 4.25, as well as along the last quarter mile of the corridor. The majority of this land has already been developed and is no longer subject to the FPPA.

If a federally funded improvement option forwarded from the study will require acquisition of lands from these areas, MDT will have to complete a CPA-106 Farmland Conversion Impact Rating Form for Linear Projects and coordinate with NRCS. NRCS will use information from that form to keep an inventory of the prime and important farmlands within the state.

### 3.1.2. Geologic Resources

Information on the geology and seismicity in the study area was obtained from several published sources. Geologic mapping was reviewed for rock types, the presence of unconsolidated material, and fault lines. The seismicity and potential seismic hazards were also reviewed. This geologic information can help determine potential design and construction issues related to embankments and road design.

It is common in this area to encounter deposits of silt interbedded with very fine-grained sand and clay from glacial lake deposits. The majority of soils are silts, fine silty sands, and clays which can be moisture sensitive. The design of future projects forwarded from the study should consider including permanent erosion and sediment control measures to the extent practicable to facilitate stabilization and revegetation of disturbed areas.

Improvements brought forward from the study will be subject to a more detailed analysis of the above-mentioned geotechnical risk factors. Part of this detailed analysis may involve taking advance borings to evaluate soil characteristics at exact project locations. This is standard procedure for most MDT road projects. The design of any improvements should consider specific requirements that come from the detailed analysis.

### 3.1.3. Surface Waters

Topographic maps and GIS data were reviewed to identify the location of surface water bodies within the study area. The Missouri River is the only surface water located within the study area. Although not within or immediately adjacent to the study area, an intermittent stream flows into the Missouri River on the opposite side of the river from the corridor study area. This intermittent stream has the potential to transport sediment or pollutants that could affect water quality of the Missouri River.

Effects on water bodies near the study area will have to be identified and coordinated with applicable agencies during any future project design. Permitting may be required for improvement options involving construction in or near the Missouri River. Coordination with federal, state, and local agencies would be necessary to determine the appropriate permits based on choice of improvement options forwarded from this study. Impacts should be avoided and minimized to the maximum extent practicable.

#### *Total Maximum Daily Loads*

Section 303 subsection “d” of the Clean Water Act requires the state of Montana to develop a list, subject to U. S. Environmental Protection Agency (USEPA) approval, of water bodies that do not meet water quality standards. When water quality fails to meet state water quality standards, the Department of Environmental Quality (DEQ) determines the causes and sources of pollutants in a sub-basin assessment and sets maximum pollutant levels, called total maximum daily loads (TMDL). TMDLs set by DEQ become the basis for implementation plans to restore water quality to a level that supports state designated beneficial water uses. The implementation plans identify and describe pollutant controls and management measures to be undertaken (such as best management practices), the mechanisms by which the selected measures would be put into action, and the individuals and entities responsible for implementation projects.

DEQ lists the section of the Missouri River that is adjacent to the study area as having impairments. The Missouri River is classified as category 5. Category 5 water bodies are waters where one or more applicable beneficial uses are impaired or threatened, and a TMDL is required to address the factors causing the impairment or threat, but has not been completed. DEQ is currently working on completing the TMDL for this watershed. Coordination with DEQ on TMDL status will occur at the development stage of potential improvements. For the Missouri River within the study area, major probable sources of impairment are industrial/commercial site stormwater discharge, and industrial point source discharges. The probable sources of impairments are not currently listed as being associated with road construction activities. That said, if improvement options are advanced, it will be necessary to reevaluate the 303(d)/305(b) integrated report for changes to listed impairments along with possible changes to TMDLs on a project level at that future time.

### *Stormwater*

The study area is located within the Great Falls MS4 area. Under the current Small MS4 General Permit, new development or redevelopment projects greater than or equal to one acre in size must implement, when practicable, low impact development (LID) practices that infiltrate, evapo-transpire, or capture for reuse the runoff generated from the first half-inch of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation. MS4 issues, including potential applicability of LID requirements, will have to be further evaluated during any future project design. In addition, there may be a need to obtain coverage under the Montana Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity during project development.

### *Wild and Scenic Rivers*

The Wild and Scenic Rivers Act Congress created in 1968 provided for the protection of certain selected rivers, as well as their immediate environments, that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Based on a review of the United States National Park Service website, the Missouri River does not carry the wild and scenic designation within the study area.

### *3.1.4. Groundwater*

There are 6,208 wells on record in Cascade County. Within the study area, there are two private domestic wells and one public water supply well. Wells can be a costly item to mitigate if they are not avoided. Mitigation of a well usually involves drilling a new well for the owner in a new location that will not be impacted by the potential project. In addition, there is a 100-foot setback requirement for public water supply wells in which no source of pollutant can be located. Public water supply wells can also be deeper and require a higher volume of water to be discharged. This can translate into a more expensive well to replace, along with affecting larger number of users compared to a private well if impacted. Impacts on existing wells should be considered if a project is forwarded from this study.



### 3.1.5. Wetlands

The U.S. Army Corps of Engineers defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Based on review of available information and on a windshield survey of the corridor, no known wetland areas are currently identified within the study area. The potential does exist for a wetland to occur within the riparian corridor of the Missouri River. Given the steepness of the terrain along the riverbanks, however, it likely would not facilitate generation of a wetland area. Future wetland investigation and potential delineation would be required if improvement options are forwarded from the study.

### 3.1.6. Floodplains and Floodways

Executive Order 11988, Floodplain Management, requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Federal Emergency Management Agency-issued flood maps for Cascade County indicate that flood plain zones existing within or adjacent to the study area.

Some areas of Zone A, Zone AE, and Zone X (0.2% chance flood) are adjacent to, or intersect, the study area on the north side of the corridor. However, the elevation difference between the Missouri River and the corridor places the road outside these areas. The majority of the study area is located within Zone X (determined to be outside the 500-year flood).

A flood plain permit is required if improvement options involve placement of fill within the regulatory flood plain. As Zone X (outside the 500-year flood) is the main flood zone within the study area, there is likely to be minimal impacts to possible improvements by flood zones. However, this should be reevaluated at the time of project development.

### 3.1.7. Irrigation

There is no irrigated agriculture land within the study area. If a project results in impacts to irrigation structures, there could be additional costs above typical project costs associated with the redesign, or moving of the irrigation structure(s). The available Water Resources Survey maps indicate that there is only one water right close to the study area. As such, irrigation structures should not be a concern for this corridor study. A more in-depth review for irrigation structures should occur at the project development stage to identify if new possible impacts are present.

### 3.1.8. Air Quality

The USEPA designates communities that do not meet National Ambient Air Quality Standards (NAAQS) as “non-attainment areas.” States are then required to develop plans to control source emissions and ensure future attainment of NAAQS. The study area is not located in a

non-attainment area for any of the criteria pollutants. Additionally, there are currently no non-attainment areas nearby. As a result, special design considerations are likely not required in future project design to accommodate NAAQS non-attainment issues.

Depending on the scope of the project under consideration along this corridor, an evaluation of mobile source air toxics (MSATs) may be required. MSATs are compounds emitted from highway vehicles and off-road equipment that are known or suspected to cause cancer or other serious health and environmental effects.

### 3.1.9. Hazardous Substances

The NRIS and Montana Board of Oil and Gas databases were searched for information on underground storage tank sites, leaking underground storage tank sites, abandoned mine sites, remediation response sites, landfills, National Priority List sites, hazardous waste, crude oil pipelines, and toxic release inventory sites. There were no oil and gas production wells, crude oil pipelines, open-cut mining sites, or toxic release inventory sites identified within the study area. At this time, none of the identified hazardous substances sites are expected to substantially impact improvements to the corridor. However, if a project were to overlap a hazardous substance site, a soil investigation would likely be needed. If contaminated soils are present, a special provision regarding handling contaminated soils is recommended to be included in project documentation. In addition, the contaminated soils could result in the need for remediation.

## 3.2. BIOLOGICAL ENVIRONMENT

The following information applies to natural resources within the study area and reflects a baseline natural resource condition. Depending on the level of detail available through the high-level baseline scan, some of the information is presented at the county level, some at the study-area level, and some at the corridor level.

### 3.2.1. Vegetation

According to the Montana Natural Heritage Program Landcover Report, the dominate landcover type in the study area is developed land consisting of open space (golf course, park), commercial/industrial, railroad, and roads. There are also small sections of grassland consisting of Great Plains mixed prairie. This landcover is a reflection of the study area being located in an urban setting.

If improvement options are forwarded from the study, practices outlined in MDT standard specifications should be followed to minimize adverse impacts to vegetation and facilitate establishment of final stabilization of disturbed areas. Removal of mature trees and shrubs should be limited to the extent practicable.

### 3.2.2. Noxious Weeds

Noxious weeds can degrade native vegetative communities, damage riparian areas, compete with native plants, create fire hazards, degrade agricultural and recreational lands, pose threats to the viability of livestock, humans, and wildlife, and are expensive to manage. Areas with a history of disturbance, like highway rights-of-way, are at particular risk of weed encroachment.

The Invaders Database System lists 28 exotic plant species and 10 Montana noxious weed species in Cascade County, some of which may be present in the study area. Reseeding of disturbed areas with desirable native plant species will help to reduce the spread and establishment of noxious weeds and to re-establish permanent vegetation. If improvements are forwarded from the study, field surveys for noxious weeds should take place prior to any ground disturbance and coordination with Cascade County Weed Board should occur. Proposed projects should incorporate the practices outlined in MDT standard specifications to minimize adverse impacts.

### 3.2.3. General Wildlife Species

#### *Mammals*

Wildlife species inhabiting or traversing the study area are typical of those that occur in developed and disturbed areas of Montana. Since many species in this area are habituated to somewhat disturbed areas and are tolerant of moderate levels of development, species present in this area are predominately, though not exclusively, generalists. Some of the generalist wildlife species present in the study area are white-tail and mule deer, coyote, red fox, porcupine, raccoon, striped skunk, muskrat, Richardson's ground squirrel, deer mouse, and meadow vole. Due to the lack of suitable habitat resulting from the level of development in the study area, density of roads, it is not anticipated that any of the listed species occurring in Cascade County would normally occur in the study area.

There were three reported occurrences of carcasses collected within the study area. One mule deer and two white-tail deer carcasses were collected in the eastern half of the corridor near the golf course.

#### *Fisheries*

The only waterbody in the study area is the Missouri River and it is listed as providing suitable habitat for an array of cold-water species. If impacts to the Missouri River will occur from future improvements, potential impacts to aquatic species will be need to be considered.

#### *Birds*

The MNHP Natural Heritage Tracker database indicates a variety of birds have been documented with the potential to occur and nest in the Study Area. These species include representative songbirds, birds of prey, waterfowl, owls, and shorebirds. The study area provides marginal habitat for migratory birds which may nest in the mature trees or move through the area as seasonal migrants.

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA). Under this strict liability law, it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Direct disturbance of a nest occupied with birds or eggs is prohibited under the law. The destruction of unoccupied nests of eagles; colonial nesters such as cormorants, herons, and pelicans; and some ground/cavity nesters such as burrowing owls or bank or cliff swallows may also be prohibited under the MBTA.

There are two bald eagle nests which occur within the general proximity of the corridor, with one of the half-mile buffer areas crossing into the study area. The study area is not typical golden eagle habitat, so presence of golden eagle nests is unlikely.

Any improvements forwarded from this study should consider potential constraints that may result from nesting/breeding periods of migratory birds and presence of unknown or future bald and golden eagles nests. Future projects that involve tree and shrub removal and/or structure replacement or rehabilitation must be conducted in compliance with MBTA, which may entail a timing restriction between April 15 and August 15.

### *Amphibians and Reptiles*

The presence of amphibians and reptiles in the study area is likely limited by lack of suitable habitat and level of development. Common species may occur in low numbers along irrigation facilities, drainages, and within wetland areas. The Plains Spadefoot has a record of collection from 1992 the area near the railroad tracks south of River Drive North. Any improvements forwarded from the study should take into consideration and minimize impacts to amphibian and reptile habitat where practicable.

### *Crucial Areas Planning System*

The Montana Fish, Wildlife and Parks (FWP) Crucial Areas Planning System (CAPS) is a resource intended to provide non-regulatory information during early planning stages of projects, conservation opportunities, and environmental review. The finest data resolution within CAPS is at the square-mile section scale or water body. Use of these data layers at a more localized scale is not appropriate and may lead to inaccurate interpretations since the classification may or may not apply to the entire square-mile section.

CAPS provides general recommendations and recommendations specific to transportation projects for both terrestrial and aquatic species and habitat. These recommendations of the CAPS system can have a generic application to possible project locations moving forward from the study. Coordination with the FWP wildlife biologist should occur during project development.

### *3.2.4. Threatened and Endangered Species*

The U.S. Fish and Wildlife Service (USFWS) maintains the federal list of threatened and endangered species. Species on this list receive protection under the Endangered Species Act. An “endangered” species is in danger of extinction throughout all or a significant portion of its range. A “threatened” species is likely to become endangered in the near future. The USFWS also maintains a list of species that are candidates or proposed for possible addition to the federal list. According to the USFWS, four threatened, endangered, proposed, or candidate species are listed as occurring in Cascade County:

- Sprague’s Pipit (Candidate)
- Whitebark Pine (Candidate)
- Red Knot (Threatened)
- Canada Lynx (Threatened, and Critical Habitat)

The Montana Natural Heritage Program - Natural Heritage Map Viewer database records and maps documents observations of species in a known location. According to the database, there are no records of any threatened, endangered, proposed, or candidate species within



the boundaries of the corridor study. Due to the lack of suitable habitat resulting from the level of development in the study area, density of roads, it is not anticipated that any of the listed species occurring in Cascade County would normally occur in the study area. It is anticipated that any project forwarded from this study would result in a “*no effect*” determination for listed species in Cascade County.

As the federal status of protected species changes over time, reevaluation of the listing status and a review for the potential occurrence of these species in the project area should take place before issuing a determination of effect relative to potential project impacts. If a project moves forward from this study, completion of an evaluation of potential effects on any of the species listed above has to occur during the project development process.

### 3.2.5. Species of Concern

Montana Species of Concern (SOCs) are native animals breeding in the state that are considered to be at risk due to declining population trends, threats to their habitats, and/or restricted distribution. Designation of a species as an SOC is not a statutory or regulatory classification. Instead, these designations provide a basis for resource managers and decision-makers to direct limited resources to priority data collection needs and to address conservation needs proactively.

A search of the MNHP species of special concern database, revealed three SOC in Cascade County that have the potential to occur and breed in the study area based on presence of suitable habitat. These species include the following:

- **Bald Eagle**: There is a nest site located approximately 0.05 miles north of the roadway across the Missouri River.
- **Plains Spadefoot**: A record from 1992 was collected from the area near the railroad tracks south of the roadway.
- **Many-headed Sedge**: There is one historic record within the boundaries of the corridor study. This record is from 1891; this species is not expected to occur in the project area due to development of Great Falls since 1891.

A thorough field investigation for the presence and extent of these species should be conducted if improvement options are forwarded from this study. If present, special conditions that apply to the project design and/or during construction such as timing restrictions should be considered to avoid or minimize impacts to these species.

## 3.3. SOCIAL AND CULTURAL ENVIRONMENT

The following subsections present an overview of the social and cultural environment within the study area.

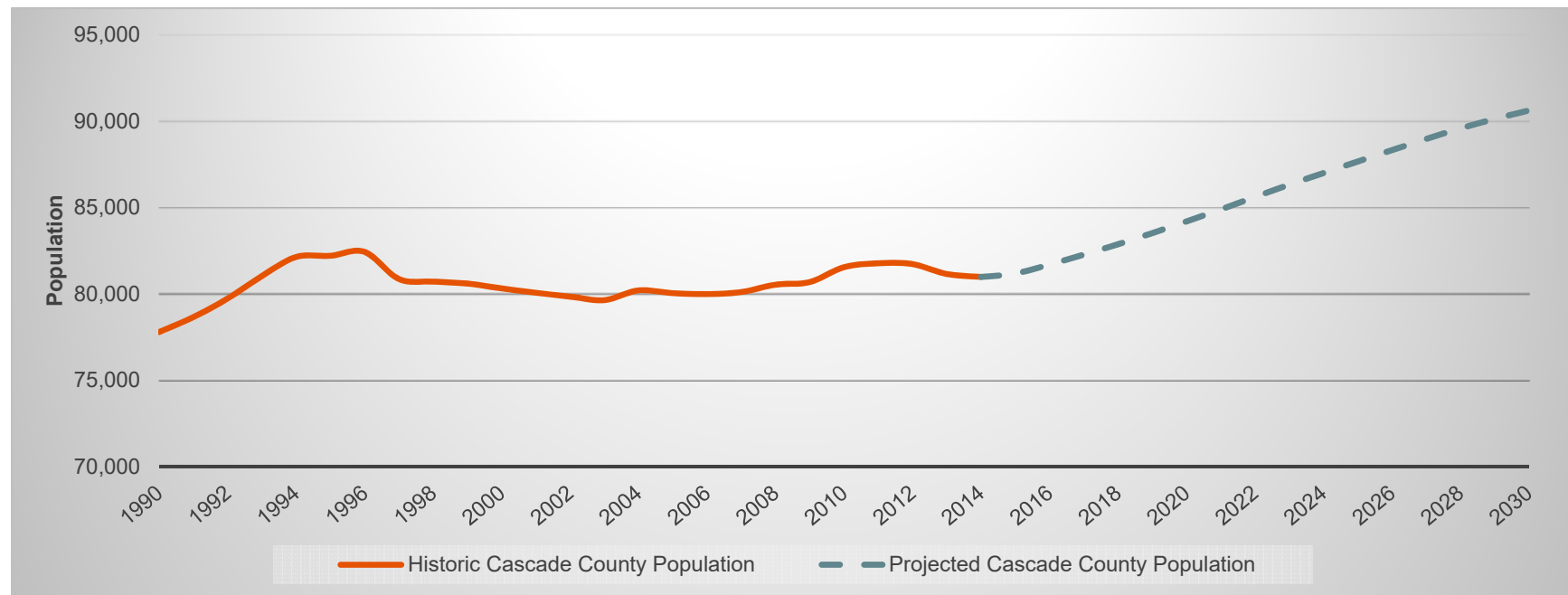
### 3.3.1. Population Demographics and Economic Conditions

Under NEPA/MEPA and associated implementing regulations, state and federal agencies are required to assess potential social and economic impacts resulting from proposed actions. FHWA guidelines recommend consideration of impacts to neighborhoods and community cohesion, social groups including minority populations, and local and/or regional economies, as well as growth and

development that may be induced by transportation improvements. Demographic and economic information presented in this section is intended to assist in identifying human populations that might be affected by improvements within the study area.

Title VI of the U. S. Civil Rights Act of 1964, as amended (USC 2000(d)) and Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, require that no minority, or, by extension, low-income person shall be disproportionately adversely impacted by any project receiving federal funds. For transportation projects, this means that no particular minority or low-income person may be disproportionately isolated, displaced, or otherwise subjected to adverse effects. If a project is forwarded from the improvement option(s), environmental justice will need to be further evaluated during the project development process.

According to the U. S. Census Bureau's estimate, Cascade County had a population of 82,384 people in 2013, and was the 5th most populous county in Montana. Great Falls, the 3rd largest city in the state, had a population of 59,351. Over the last 15 years, Cascade County has seen slight increases and decreases in population. The population is projected to grow over the next fifteen years, but at rate less than Montana as a whole (see **Figure 8**).



**Figure 8: Historic and Projected Population for Cascade County**

Source: Montana Department of Commerce, eREMI data.

Past trends in growth for the City of Great Falls indicate that this projected growth may be high. A large part of the City of Great Falls economy relies on Malmstrom AFB which does not have the potential for growth seen in other industries such as energy, tech, or tourism. These other industries have not shown tremendous growth in the City of Great Falls, which is reflected in the city's population having smaller growth than other major cities of Montana.

The population ethnicity in Cascade County is primarily White/Caucasian (89.1 percent). Hispanic or Latino individuals comprise just over three percent of the population. Great Falls has a slightly more diverse ethnic population compared to the Montana average. Malmstrom Air Force Base (in Great Falls) and the two Native American Reservations (Blackfeet Reservation and Rocky Boy Reservation) located within 100 miles of Great Falls could be contributors to the higher than Montana average population diversity seen in Great Falls.

Cascade County and Great Falls residents have a slightly higher percentage of people under the age of 18 and people over the age of 65, with a smaller proportion in the 18 to 64 age range. The median age of 39.2 in Great Falls is still slightly younger than the state median of 39.9 years.

Cascade County's labor market has shown strong performance as evidenced by its 3.7 percent unemployment rate. The county is one of many in Montana showing strong labor market conditions and low unemployment, especially as compared to the rest of the United States. Educational Services, health care and social assistance industries account for 23.8 percent of employment in Cascade County, which is slightly above the Montana average of 22.8 percent. Great Falls and Cascade County employment mirrors that of the State of Montana, and as mentioned earlier, lacks the growth in technology, tourism, and energy industries other Montana cities are seeing.

Median household income for Cascade County is \$44,963 and the City of Great Falls is \$43,822, both of which are lower than the state average of \$46,230. The poverty levels for the City of Great Falls and Cascade County are 16.5 percent, and 14.9 percent, respectively. The state average poverty level is 15.2 percent.

Three census tracts overlap the corridor study area. The overlap incorporates information from locations surrounding the corridor study area, but does not include all census data for the City of Great Falls. The data from the three census tracts around the study area indicates a poverty level of 19.37 percent and minority population of 16.43 percent, both of which are higher than City of Great Falls average.

Cascade County's economy has only moderate growth projected in the near future. The median income within the study area is likely below statewide averages, while the minority population is likely higher than statewide averages. As such, further investigation may be necessary during project development to determine the possibility of low-income and/or minority person(s) being disproportionately isolated, displaced, or otherwise subjected to adverse effects.

### 3.3.2. Land Ownership

Ownership of land in the study area is predominantly local government, with some interspersed private, commercial, and federal owners. The specific public landowners include the City of Great Falls, FWP, and MDT. The City of Great Falls land includes the Eagle Falls Golf

Club and Parks and Recreation land. The FWP land encompasses a majority of the land on the north side of the study area along the bank of the Missouri River. The majority of private land use within the study area is either industrial or commercial. Some properties are physically close to the River Drive North roadway, which may inhibit future project development. If improvements are forwarded from this study, land use at and adjacent to possible projects will need to be considered during design for determining overall project costs.

### 3.3.3. Recreational Resources

Cascade County and the Great Falls area offer a variety of year round outdoor activities. Some of the local activities available either in or adjacent to the study area include walking, running, biking, site seeing, and golfing. Adjacent to the study area are the Veteran's Memorial Park, Eagle Falls Golf Club, the Centene Stadium, and the road that leads to the Giant Springs State Park which contains the Lewis and Clark Interpretive Center and the Giant Springs Fish Hatchery.

Recreational resource information was gathered through review of FWP resource lists, the City of Great Falls website, and websites for the specific venues. Recreational areas may be protected under Section 4(f) of the US Department of Transportation Act of 1966, which was enacted to protect publically owned parks, recreation areas, wildlife and waterfowl refuges, and public and private historic sites of local, state, and national significance. Federally funded transportation projects cannot impact Section 4(f)-protected properties unless there are no feasible and prudent avoidance alternatives and all possible planning to minimize harm has occurred.

From a high level evaluation, there appears to be recreational-related potential 4(f) resources within the study area that could potentially be impacted from future improvements. These are the Eagle Falls Golf Club and Veteran's Memorial Park both located on City of Great Falls property. The Eagle Falls Golf Club is owned by the City of Great Falls and open to the public. Acquiring right-of-way from these potential 4(f) lands would need to go through the evaluation process described above which could add time and costs to a project.

According to the FWP National Land and Water Conservation Fund Act (LWCFA) Sites by County, there is one Section 6(f) resource within the study area. This 6(f) resource is Giant Springs State Park. LWCFA funds were utilized in both the acquisition and development of the state park lands. FWP has indicated that the entire property has LWCFA 6(f) protection. This 6(f) resource should be taken into consideration for any potential forwarded projects, as converting to a non-recreational resource will be both difficult and time-consuming.

Reevaluation of 4(f) and 6(f) resources is likely needed during project development. If future resources are discovered, efforts should be made to avoid adverse impacts to, or right of way acquisitions from, these community recreational resources.

### 3.3.4. Cultural Resources

A file search of the study area through the Montana State Historic Preservation Office revealed four historic properties sites located within sections 4, 5, and 6, T20N, R4E. These four properties have been previously recorded and National Register of Historic Places status established. All four properties are near, but not within, the study area.



Other potentially historic resources exist within the study area. An examination of the Montana Cadastral Survey information for the designated corridor indicates that at least 10 historic-age properties are adjacent to the study corridor. These resources are “unrecorded historic sites” and include nine commercial properties that were constructed between 1950 and 1962.

Direct and indirect impacts (such as visual, noise, and access impacts) to eligible or listed properties would need to be considered during project development. A cultural resource survey for unrecorded historic and archaeological properties within the Area of Potential Effect will need to be completed during the project development process.

#### 3.3.5. Noise

Traffic noise may have to be evaluated for planned improvements to the study corridor. Noise analysis is necessary for “Type I” projects. If the roadway improvements are limited (e.g., the horizontal and vertical alignments are not changed, and the highway remains a two-lane facility), then the project would not be considered a Type I project.

If the improvements planned for the road would include a substantial shift in the horizontal or vertical alignments, increasing the number of through-lanes, passing lanes, or turning lanes, or increasing the traffic speed and volume, then the project would be considered a Type I project, which would require a detailed noise analysis. The analysis would include measuring ambient noise levels at selected receivers and modeling design-year noise levels using projected traffic volumes.

Noise abatement measures would be considered for the project if noise levels would approach or substantially exceed the noise abatement criteria. The noise abatement measures must be considered reasonable and feasible before implementation. If noise abatement measures were deemed necessary, they could increase costs of proposed future Type I roadway improvements. Construction activities in the study area may cause localized, short-duration noise impacts. These impacts can be minimized by using standard MDT specifications for the control of noise sources during construction.

There are sensitive noise receptors within the study area which may need evaluation during project development. These receptors include the River’s Edge Trail, Veteran’s Memorial Park, Eagle Falls Golf Club, Bob Speck Municipal Golf Course, Centene Stadium, and Giant Springs State Park. Due to these receptors, the majority of the corridor will qualify as an Active Category C for the Noise Abatement Criteria.

#### 3.3.6. Visual Resources

The visual resources of an area include landforms, vegetation, water features, and physical modifications caused by human activities that give the landscape its visual character and aesthetic qualities. Visual resources are typically assessed based on the landscape character (what is seen), visual sensitivity (human preferences and values regarding what is seen), scenic integrity (degree of intactness and wholeness in landscape character), and landscape visibility (relative distance of seen areas) of a geographically defined view shed.

The visual resources of an area include landforms, vegetation, water features, and physical modifications caused by human activities that give the landscape its visual character and aesthetic qualities. Visual resources are typically assessed based on the landscape character (what is seen), visual sensitivity (human preferences and values regarding what is seen), scenic integrity (degree of intactness and wholeness in landscape character), and landscape visibility (relative distance of seen areas) of a geographically defined view shed.

The River's Edge Trail allows the public to walk and bike along the edge of the Missouri River. An historic marker at approximately RP 4.6 describes the history of Black Eagle. Pullouts exist along the corridor allowing views of Black Eagle Falls. Along with a view of Black Eagle Falls, sandstone outcroppings are visible along the cliffs. One of the pullouts is the Caboose trailhead which has two railroad cars and several picnic tables for public use. Another visually appealing aspect is the Veteran's Memorial Park, which has a wall of tiles dedicated to those that have served in any branch of the US military.

These features lead to a visually appealing setting which considered during the development of improvement options. An evaluation of the potential effects on visual resources may be necessary, depending on the improvement options forwarded from this study.

## 4.0. AREAS OF CONCERN AND CONSIDERATION SUMMARY

This section provides a list and description of areas of concern and consideration within the study area. These areas were identified through review of as-built drawings, field review, public databases, and other resources. More discussion has been provided in the previous sections, and it is reiterated here as appropriate.

### 4.1. TRANSPORTATION SYSTEM

#### **Access and Right-of-way**

- West of 25<sup>th</sup> Street North, businesses closely front the roadway which provides little room for ingress/egress and for parking.

#### **Non-motorized**

- The River's Edge Trail is located on the north side of the roadway.
- The Caboose Trailhead is located just east of 19<sup>th</sup> Street North and provides parking and access to the River's Edge Trail.
- There is a trail spur that terminates at the intersection with 19<sup>th</sup> Street North. There are no crossing treatments at this location.

#### **Rail**

- There is an at-grade crossing between Giant Springs Road and 38<sup>th</sup> Street North.

#### **Freight**

- The study corridor is a designated truck route and is part of the Northeast Bypass.
- The route currently experiences approximately 7.2 percent heavy vehicle traffic.

#### **Traffic Operations**

- The intersection with 15<sup>th</sup> Street North is projected to experience a LOS of E during the AM and PM peak hours.
- The intersection with 25<sup>th</sup> Street North currently experiences a LOS of F during the PM peak hour. The intersection is projected to experience a LOS of F during the AM, noon, and PM peak hours.

#### **Geometrics**

- Two vertical curves do not meet current standards for rate of curvature.
- The grade between RP 3.8 and RP 4.0 exceeds current standards.

### **Safety**

- Crash clusters were noted at the following locations:
  - 15<sup>th</sup> Street North intersection
  - East of 15<sup>th</sup> Street North
  - Big Stack Mobile Home Court approach
  - 12<sup>th</sup> Street North intersection
  - Black Eagle Falls scenic pullout
  - Giant Springs Road intersection
  - Railroad crossing
  - 38<sup>th</sup> Street North intersection
- A trend of rear-end crashes was noted along the study corridor.

## 4.2. ENVIRONMENTAL CONSIDERATIONS

### **Physical Environment**

- The roadway is constrained to the north by the Missouri River.
- The study area is located within the Great Falls MS4 area.
- There is a public water supply well located within the study area.

### **Biological Environment**

- Noxious and exotic plant species may be located within the study area.
- Two bald eagle nests are located within the general proximity of the study corridor.
- Three species of concern have the potential to occur and breed within the study area.

### **Social and Cultural Environment**

- The median income within the study area is likely below the statewide average.
- The minority population within the study area is likely higher than the statewide average.
- There are likely 4(f) and 6(f) resources within the study area.
- There are historic-age properties adjacent to the study corridor.
- There are sensitive noise receptors within the study area.
- Visual resources include multiple scenic pull-outs, the Black Eagle Falls, the Veteran's Memorial Park, and the sandstone outcroppings along the cliffs.



## 5.0. REFERENCES

- <sup>1</sup> *Great Falls Long Range Transportation Plan – 2014*, Robert Peccia and Associates, March 17, 2014, [http://www.greatfallsmt.net/sites/default/files/fileattachments/greatfalls\\_lrtp\\_final\\_adopted\\_low\\_res.pdf](http://www.greatfallsmt.net/sites/default/files/fileattachments/greatfalls_lrtp_final_adopted_low_res.pdf)
- <sup>2</sup> *Cascade County Growth Policy Update (2014)*, Cascade County, May 2014, <http://www.cascadecountymt.gov/doc/growthpolicy2014.pdf>
- <sup>3</sup> *City of Great Falls Growth Policy Update (2013)*, Planning and Community Development Department, August 2013, <http://www.greatfallsmt.net/planning/growth-policy-2013>
- <sup>4</sup> *Great Falls Transit Development Plan (TDP)*, LSC Transportation Consultants, Inc., October 29, 2010, <http://www.lscs.com/projects/greatfalls/final/>
- <sup>5</sup> *River Drive North Feasibility Study*, George Mason University, May 12, 2009, [http://spgia.gmu.edu/wp-content/uploads/River\\_Drive\\_North\\_Feasibility\\_Study.pdf](http://spgia.gmu.edu/wp-content/uploads/River_Drive_North_Feasibility_Study.pdf)
- <sup>6</sup> *Great Falls Arterial Feasibility Study*, HMK Engineering, February 2004
- <sup>7</sup> *Great Falls South Arterial Alignment Study*, HKM Engineering, 2009, [https://www.mdt.mt.gov/pubinvolve/greatfalls/docs/final\\_report.pdf](https://www.mdt.mt.gov/pubinvolve/greatfalls/docs/final_report.pdf)
- <sup>8</sup> *Missouri River Urban Corridor Plan*, CTA LandWorks Group, 2004, <http://www.greatfallsmt.net/sites/default/files/fileattachments/mrucp1.pdf>
- <sup>9</sup> *Montana Road Log*, Montana Department of Transportation, 2013, [http://www.mdt.mt.gov/publications/docs/brochures/2013\\_ROADLOG.PDF](http://www.mdt.mt.gov/publications/docs/brochures/2013_ROADLOG.PDF)
- <sup>10</sup> *Maintenance Operations and Procedures Manual*, Montana Department of Transportation, Chapter 9, Winter Maintenance Program, December 2009, <http://www.mdt.mt.gov/publications/docs/manuals/mmanual/chapt9c.pdf>
- <sup>11</sup> *Seasonal Day of the Week for Axle Counts*, Montana Department of Transportation, 2015, [http://www.mdt.mt.gov/other/webdata/external/Planning/seasonal\\_axle/AXLE\\_FACTORS\\_2015.PDF](http://www.mdt.mt.gov/other/webdata/external/Planning/seasonal_axle/AXLE_FACTORS_2015.PDF)
- <sup>12</sup> *Road Design Manual*, Montana Department of Transportation, July 18, 2008, <http://www.mdt.mt.gov/publications/manuals.shtml>
- <sup>13</sup> *River Drive North – Environmental Scan Report Draft*, MDT Environmental, Revised November 10, 2015

# Appendix A

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## *Field Inspection Photo Log*





**Photo 1: Looking east near the intersection with 15<sup>th</sup> Street North (RP 3.5)**



**Photo 2: Looking west near the intersection with 15<sup>th</sup> Street North (RP 3.5)**





**Photo 3: Looking east at the intersection with 19th Street North (RP 3.7)**



**Photo 4: Looking west near the intersection with 19th Street North (RP 3.8)**





**Photo 5: Looking east near the Caboose Trailhead (RP 3.8)**



**Photo 6: Looking north at the Caboose Trailhead (RP 3.8)**





**Photo 7: Looking west at the Caboose Trailhead (RP 3.8)**



**Photo 8: Looking north at a drainage near the Caboose Trailhead (RP 3.8)**





Photo 9: Looking east at the Big Stack Mobile Home Court entrance (RP 3.9)



Photo 10: Looking east from the Big Stack Mobile Home Court entrance (RP 4.0)





**Photo 11: Looking west from the Big Stack Mobile Home Court entrance (RP 4.0)**



**Photo 12: Looking west near the business district (RP 4.1)**



Photo 13: Looking east at the business district (RP 4.1)



Photo 14: Looking west at the business district (RP 4.2)





**Photo 15: Looking west at the business district (RP 4.2)**



**Photo 16: Looking east at the intersection with 25<sup>th</sup> Street North (RP 4.2)**





**Photo 17: Looking north at the intersection with 25<sup>th</sup> Street North (RP 4.3)**



**Photo 18: Looking west at the intersection with 25<sup>th</sup> Street North**





**Photo 19: Looking east near the Veteran's Memorial Park (RP 4.4)**



**Photo 20: Looking west at the Veteran's Memorial Park (RP 4.4)**





**Photo 21: Looking west at the retaining wall near the Veteran's Memorial Park (RP 4.5)**



**Photo 22: Looking west from a scenic pullout (RP 4.6)**





Photo 23: Looking east near the Eagle Falls Golf Club (RP 4.6)



Photo 24: Black Eagle historic marker (RP 4.6)





**Photo 25: Looking east at the Eagle Falls Golf Club (RP 4.6)**



**Photo 26: Looking east near Eagle Falls Golf Club (RP 4.8)**





**Photo 27: Looking north at the intersection with Giant Spring Road (RP 5.2)**



**Photo 28: Looking east at the railroad crossing (RP 5.2)**



Photo 29: Looking west from the intersection with Giant Springs Road (RP 5.2)



Photo 30: Looking west at the railroad crossing (RP 5.3)





**Photo 31: Looking west from the intersection with 38<sup>th</sup> Street North (RP 5.4)**



**Photo 32: Looking north at the intersection with 38<sup>th</sup> Street North (RP 5.4)**

# Appendix B

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## *Data Collection*



**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-057                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 11073                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** 2-WAY                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	54	64	0	0	0	0	59
1am to 2am	0	24	39	0	0	0	0	32
2am to 3am	0	18	32	0	0	0	0	25
3am to 4am	0	36	33	0	0	0	0	35
4am to 5am	0	55	58	0	0	0	0	57
5am to 6am	0	189	212	0	0	0	0	201
6am to 7am	0	409	398	0	0	0	0	404
7am to 8am	0	697	685	0	0	0	0	691
8am to 9am	0	500	520	0	0	0	0	510
9am to 10am	0	560	557	0	0	0	0	559
10am to 11am	0	616	662	0	0	0	0	639
11am to 12pm	0	695	746	0	0	0	0	721
12pm to 1pm	0	746	754	0	0	0	0	750
1pm to 2pm	0	765	734	0	0	0	0	750
2pm to 3pm	0	826	849	0	0	0	0	838
3pm to 4pm	0	767	774	0	0	0	0	771
4pm to 5pm	0	958	944	0	0	0	0	951
5pm to 6pm	0	866	905	0	0	0	0	886
6pm to 7pm	0	531	583	0	0	0	0	557
7pm to 8pm	0	424	445	0	0	0	0	435
8pm to 9pm	0	372	365	0	0	0	0	369
9pm to 10pm	0	266	312	0	0	0	0	289
10pm to 11pm	0	140	163	0	0	0	0	152
11pm to 12am	0	78	74	0	0	0	0	76
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>10,592</b>	<b>10,908</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10,750</b>
<b>% of AADT</b>	<b>0.0</b>	<b>95.7</b>	<b>98.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	



**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-057\_NB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 5554                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** NB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	35	34	0	0	0	0	35
1am to 2am	0	15	27	0	0	0	0	21
2am to 3am	0	13	18	0	0	0	0	16
3am to 4am	0	29	24	0	0	0	0	27
4am to 5am	0	38	38	0	0	0	0	38
5am to 6am	0	122	133	0	0	0	0	128
6am to 7am	0	254	259	0	0	0	0	257
7am to 8am	0	457	453	0	0	0	0	455
8am to 9am	0	277	274	0	0	0	0	276
9am to 10am	0	297	278	0	0	0	0	288
10am to 11am	0	322	344	0	0	0	0	333
11am to 12pm	0	372	386	0	0	0	0	379
12pm to 1pm	0	385	409	0	0	0	0	397
1pm to 2pm	0	408	398	0	0	0	0	403
2pm to 3pm	0	415	443	0	0	0	0	429
3pm to 4pm	0	423	365	0	0	0	0	394
4pm to 5pm	0	463	473	0	0	0	0	468
5pm to 6pm	0	450	451	0	0	0	0	451
6pm to 7pm	0	314	368	0	0	0	0	341
7pm to 8pm	0	241	261	0	0	0	0	251
8pm to 9pm	0	199	206	0	0	0	0	203
9pm to 10pm	0	148	142	0	0	0	0	145
10pm to 11pm	0	72	103	0	0	0	0	88
11pm to 12am	0	47	52	0	0	0	0	50
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>5,796</b>	<b>5,939</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,868</b>
<b>% of AADT</b>	<b>0.0</b>	<b>104.4</b>	<b>106.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-057\_SB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 4622                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** SB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	19	30	0	0	0	0	25
1am to 2am	0	9	12	0	0	0	0	11
2am to 3am	0	5	14	0	0	0	0	10
3am to 4am	0	7	9	0	0	0	0	8
4am to 5am	0	17	20	0	0	0	0	19
5am to 6am	0	67	79	0	0	0	0	73
6am to 7am	0	155	139	0	0	0	0	147
7am to 8am	0	240	232	0	0	0	0	236
8am to 9am	0	223	246	0	0	0	0	235
9am to 10am	0	263	279	0	0	0	0	271
10am to 11am	0	294	318	0	0	0	0	306
11am to 12pm	0	323	360	0	0	0	0	342
12pm to 1pm	0	361	345	0	0	0	0	353
1pm to 2pm	0	357	336	0	0	0	0	347
2pm to 3pm	0	411	406	0	0	0	0	409
3pm to 4pm	0	344	409	0	0	0	0	377
4pm to 5pm	0	495	471	0	0	0	0	483
5pm to 6pm	0	416	454	0	0	0	0	435
6pm to 7pm	0	217	215	0	0	0	0	216
7pm to 8pm	0	183	184	0	0	0	0	184
8pm to 9pm	0	173	159	0	0	0	0	166
9pm to 10pm	0	118	170	0	0	0	0	144
10pm to 11pm	0	68	60	0	0	0	0	64
11pm to 12am	0	31	22	0	0	0	0	27
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	4,796	4,969	0	0	0	0	4,883
% of AADT	0.0	103.8	107.5	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-058                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 13329                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** 2-WAY                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	55	61	0	0	0	0	58
1am to 2am	0	39	45	0	0	0	0	42
2am to 3am	0	27	26	0	0	0	0	26
3am to 4am	0	41	45	0	0	0	0	43
4am to 5am	0	76	77	0	0	0	0	77
5am to 6am	0	298	308	0	0	0	0	303
6am to 7am	0	647	655	0	0	0	0	651
7am to 8am	0	958	972	0	0	0	0	965
8am to 9am	0	696	715	0	0	0	0	706
9am to 10am	0	659	669	0	0	0	0	664
10am to 11am	0	719	737	0	0	0	0	728
11am to 12pm	0	825	859	0	0	0	0	842
12pm to 1pm	0	912	938	0	0	0	0	925
1pm to 2pm	0	883	889	0	0	0	0	886
2pm to 3pm	0	950	947	0	0	0	0	949
3pm to 4pm	0	977	981	0	0	0	0	979
4pm to 5pm	0	1,198	1,223	0	0	0	0	1,210
5pm to 6pm	0	1,162	1,212	0	0	0	0	1,187
6pm to 7pm	0	698	743	0	0	0	0	721
7pm to 8pm	0	494	548	0	0	0	0	521
8pm to 9pm	0	390	435	0	0	0	0	412
9pm to 10pm	0	296	335	0	0	0	0	316
10pm to 11pm	0	171	192	0	0	0	0	182
11pm to 12am	0	87	85	0	0	0	0	86
<b># Days</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>13,259</b>	<b>13,699</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,479</b>
<b>% of AADT</b>	<b>0.0</b>	<b>99.5</b>	<b>102.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-058\_NB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 5982                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** NB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	28	29	0	0	0	0	29
1am to 2am	0	16	21	0	0	0	0	19
2am to 3am	0	15	14	0	0	0	0	14
3am to 4am	0	18	22	0	0	0	0	20
4am to 5am	0	31	34	0	0	0	0	32
5am to 6am	0	128	134	0	0	0	0	131
6am to 7am	0	272	268	0	0	0	0	270
7am to 8am	0	403	414	0	0	0	0	408
8am to 9am	0	330	336	0	0	0	0	333
9am to 10am	0	321	309	0	0	0	0	315
10am to 11am	0	343	356	0	0	0	0	350
11am to 12pm	0	397	418	0	0	0	0	408
12pm to 1pm	0	421	440	0	0	0	0	430
1pm to 2pm	0	431	420	0	0	0	0	426
2pm to 3pm	0	464	477	0	0	0	0	471
3pm to 4pm	0	465	491	0	0	0	0	478
4pm to 5pm	0	609	608	0	0	0	0	608
5pm to 6pm	0	577	593	0	0	0	0	585
6pm to 7pm	0	319	346	0	0	0	0	333
7pm to 8pm	0	237	259	0	0	0	0	248
8pm to 9pm	0	190	213	0	0	0	0	202
9pm to 10pm	0	157	185	0	0	0	0	171
10pm to 11pm	0	87	96	0	0	0	0	91
11pm to 12am	0	42	40	0	0	0	0	41
<b># Days</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>6,299</b>	<b>6,524</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6,412</b>
<b>% of AADT</b>	<b>0.0</b>	<b>105.3</b>	<b>109.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-058\_SB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 6661                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** SB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	27	31	0	0	0	0	29
1am to 2am	0	23	24	0	0	0	0	23
2am to 3am	0	12	12	0	0	0	0	12
3am to 4am	0	23	23	0	0	0	0	23
4am to 5am	0	45	43	0	0	0	0	44
5am to 6am	0	170	173	0	0	0	0	172
6am to 7am	0	375	387	0	0	0	0	381
7am to 8am	0	556	559	0	0	0	0	557
8am to 9am	0	366	380	0	0	0	0	373
9am to 10am	0	338	360	0	0	0	0	349
10am to 11am	0	375	381	0	0	0	0	378
11am to 12pm	0	428	441	0	0	0	0	435
12pm to 1pm	0	492	498	0	0	0	0	495
1pm to 2pm	0	453	469	0	0	0	0	461
2pm to 3pm	0	487	470	0	0	0	0	478
3pm to 4pm	0	513	490	0	0	0	0	501
4pm to 5pm	0	589	615	0	0	0	0	602
5pm to 6pm	0	586	619	0	0	0	0	602
6pm to 7pm	0	379	397	0	0	0	0	388
7pm to 8pm	0	257	289	0	0	0	0	273
8pm to 9pm	0	200	221	0	0	0	0	211
9pm to 10pm	0	139	151	0	0	0	0	145
10pm to 11pm	0	84	97	0	0	0	0	90
11pm to 12am	0	45	45	0	0	0	0	45
<b># Days</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>6,959</b>	<b>7,175</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7,067</b>
<b>% of AADT</b>	<b>0.0</b>	<b>104.5</b>	<b>107.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	



**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
Criteria: From To From To From To From To

District Location ID 07-2A-059 Community GREAT FALLS Roadbed ML  
County CASCADE AADT 11338 Located On: RIVER DR  
Collection Type Direction 2-WAY Route

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	32	33	0	0	0	0	33
1am to 2am	0	21	29	0	0	0	0	25
2am to 3am	0	19	15	0	0	0	0	17
3am to 4am	0	25	33	0	0	0	0	29
4am to 5am	0	75	67	0	0	0	0	71
5am to 6am	0	272	270	0	0	0	0	271
6am to 7am	0	557	587	0	0	0	0	572
7am to 8am	0	940	931	0	0	0	0	936
8am to 9am	0	677	693	0	0	0	0	685
9am to 10am	0	567	557	0	0	0	0	562
10am to 11am	0	600	574	0	0	0	0	587
11am to 12pm	0	693	689	0	0	0	0	691
12pm to 1pm	0	770	825	0	0	0	0	798
1pm to 2pm	0	754	744	0	0	0	0	749
2pm to 3pm	0	837	787	0	0	0	0	812
3pm to 4pm	0	890	872	0	0	0	0	881
4pm to 5pm	0	1,092	1,118	0	0	0	0	1,105
5pm to 6pm	0	1,135	1,141	0	0	0	0	1,138
6pm to 7pm	0	673	683	0	0	0	0	678
7pm to 8pm	0	458	482	0	0	0	0	470
8pm to 9pm	0	268	316	0	0	0	0	292
9pm to 10pm	0	207	179	0	0	0	0	193
10pm to 11pm	0	111	122	0	0	0	0	117
11pm to 12am	0	65	38	0	0	0	0	52
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	11,738	11,785	0	0	0	0	11,762
% of AADT	0.0	103.5	103.9	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-060                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 10705                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** 2-WAY                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	34	32	0	0	0	0	33
1am to 2am	0	18	26	0	0	0	0	22
2am to 3am	0	18	20	0	0	0	0	19
3am to 4am	0	22	29	0	0	0	0	26
4am to 5am	0	68	63	0	0	0	0	66
5am to 6am	0	250	246	0	0	0	0	248
6am to 7am	0	510	513	0	0	0	0	512
7am to 8am	0	911	899	0	0	0	0	905
8am to 9am	0	671	662	0	0	0	0	667
9am to 10am	0	526	521	0	0	0	0	524
10am to 11am	0	580	552	0	0	0	0	566
11am to 12pm	0	623	623	0	0	0	0	623
12pm to 1pm	0	700	790	0	0	0	0	745
1pm to 2pm	0	693	708	0	0	0	0	701
2pm to 3pm	0	759	748	0	0	0	0	754
3pm to 4pm	0	823	801	0	0	0	0	812
4pm to 5pm	0	1,000	1,049	0	0	0	0	1,025
5pm to 6pm	0	1,093	1,105	0	0	0	0	1,099
6pm to 7pm	0	647	670	0	0	0	0	659
7pm to 8pm	0	447	460	0	0	0	0	454
8pm to 9pm	0	255	308	0	0	0	0	282
9pm to 10pm	0	207	192	0	0	0	0	200
10pm to 11pm	0	110	127	0	0	0	0	119
11pm to 12am	0	61	41	0	0	0	0	51
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>11,026</b>	<b>11,185</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11,106</b>
<b>% of AADT</b>	<b>0.0</b>	<b>103.0</b>	<b>104.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-060\_NB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 3281                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** NB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	16	16	0	0	0	0	16
1am to 2am	0	11	13	0	0	0	0	12
2am to 3am	0	10	11	0	0	0	0	11
3am to 4am	0	15	20	0	0	0	0	18
4am to 5am	0	48	42	0	0	0	0	45
5am to 6am	0	152	153	0	0	0	0	153
6am to 7am	0	308	311	0	0	0	0	310
7am to 8am	0	563	533	0	0	0	0	548
8am to 9am	0	348	362	0	0	0	0	355
9am to 10am	0	260	268	0	0	0	0	264
10am to 11am	0	284	278	0	0	0	0	281
11am to 12pm	0	292	297	0	0	0	0	295
12pm to 1pm	0	386	426	0	0	0	0	406
1pm to 2pm	0	383	368	0	0	0	0	376
2pm to 3pm	0	376	364	0	0	0	0	370
3pm to 4pm	0	407	397	0	0	0	0	402
4pm to 5pm	0	407	458	0	0	0	0	433
5pm to 6pm	0	509	515	0	0	0	0	512
6pm to 7pm	0	355	334	0	0	0	0	345
7pm to 8pm	0	219	236	0	0	0	0	228
8pm to 9pm	0	142	170	0	0	0	0	156
9pm to 10pm	0	97	109	0	0	0	0	103
10pm to 11pm	0	63	58	0	0	0	0	61
11pm to 12am	0	32	23	0	0	0	0	28
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	5,683	5,762	0	0	0	0	5,723
% of AADT	0.0	173.2	175.6	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-060\_SB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 3452                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** SB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	18	16	0	0	0	0	17
1am to 2am	0	7	13	0	0	0	0	10
2am to 3am	0	8	9	0	0	0	0	9
3am to 4am	0	7	9	0	0	0	0	8
4am to 5am	0	20	21	0	0	0	0	21
5am to 6am	0	98	93	0	0	0	0	96
6am to 7am	0	202	202	0	0	0	0	202
7am to 8am	0	348	366	0	0	0	0	357
8am to 9am	0	323	300	0	0	0	0	312
9am to 10am	0	266	253	0	0	0	0	260
10am to 11am	0	296	274	0	0	0	0	285
11am to 12pm	0	331	326	0	0	0	0	329
12pm to 1pm	0	314	364	0	0	0	0	339
1pm to 2pm	0	310	340	0	0	0	0	325
2pm to 3pm	0	383	384	0	0	0	0	384
3pm to 4pm	0	416	404	0	0	0	0	410
4pm to 5pm	0	593	591	0	0	0	0	592
5pm to 6pm	0	584	590	0	0	0	0	587
6pm to 7pm	0	292	336	0	0	0	0	314
7pm to 8pm	0	228	224	0	0	0	0	226
8pm to 9pm	0	113	138	0	0	0	0	126
9pm to 10pm	0	110	83	0	0	0	0	97
10pm to 11pm	0	47	69	0	0	0	0	58
11pm to 12am	0	29	18	0	0	0	0	24
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	5,343	5,423	0	0	0	0	5,383
% of AADT	0.0	154.8	157.1	0.0	0.0	0.0	0.0	



**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-061                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 7399                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** 2-WAY                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	23	23	0	0	0	0	23
1am to 2am	0	14	15	0	0	0	0	15
2am to 3am	0	8	13	0	0	0	0	11
3am to 4am	0	19	23	0	0	0	0	21
4am to 5am	0	48	47	0	0	0	0	48
5am to 6am	0	171	176	0	0	0	0	174
6am to 7am	0	381	395	0	0	0	0	388
7am to 8am	0	646	636	0	0	0	0	641
8am to 9am	0	438	483	0	0	0	0	461
9am to 10am	0	400	389	0	0	0	0	395
10am to 11am	0	437	404	0	0	0	0	421
11am to 12pm	0	463	466	0	0	0	0	465
12pm to 1pm	0	530	625	0	0	0	0	578
1pm to 2pm	0	528	529	0	0	0	0	529
2pm to 3pm	0	509	491	0	0	0	0	500
3pm to 4pm	0	563	548	0	0	0	0	556
4pm to 5pm	0	670	720	0	0	0	0	695
5pm to 6pm	0	733	766	0	0	0	0	750
6pm to 7pm	0	353	393	0	0	0	0	373
7pm to 8pm	0	247	266	0	0	0	0	257
8pm to 9pm	0	141	178	0	0	0	0	160
9pm to 10pm	0	108	121	0	0	0	0	115
10pm to 11pm	0	77	75	0	0	0	0	76
11pm to 12am	0	37	25	0	0	0	0	31
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	7,544	7,807	0	0	0	0	7,676
% of AADT	0.0	102.0	105.5	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-061\_NB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 5020                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** NB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	11	13	0	0	0	0	12
1am to 2am	0	4	7	0	0	0	0	6
2am to 3am	0	5	6	0	0	0	0	6
3am to 4am	0	4	5	0	0	0	0	5
4am to 5am	0	14	17	0	0	0	0	16
5am to 6am	0	54	55	0	0	0	0	55
6am to 7am	0	100	110	0	0	0	0	105
7am to 8am	0	190	200	0	0	0	0	195
8am to 9am	0	186	198	0	0	0	0	192
9am to 10am	0	192	186	0	0	0	0	189
10am to 11am	0	222	193	0	0	0	0	208
11am to 12pm	0	260	246	0	0	0	0	253
12pm to 1pm	0	236	296	0	0	0	0	266
1pm to 2pm	0	239	260	0	0	0	0	250
2pm to 3pm	0	262	262	0	0	0	0	262
3pm to 4pm	0	288	288	0	0	0	0	288
4pm to 5pm	0	449	468	0	0	0	0	459
5pm to 6pm	0	456	467	0	0	0	0	462
6pm to 7pm	0	188	200	0	0	0	0	194
7pm to 8pm	0	129	138	0	0	0	0	134
8pm to 9pm	0	74	89	0	0	0	0	82
9pm to 10pm	0	50	54	0	0	0	0	52
10pm to 11pm	0	39	45	0	0	0	0	42
11pm to 12am	0	16	10	0	0	0	0	13
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	3,668	3,813	0	0	0	0	3,741
% of AADT	0.0	73.1	76.0	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-061\_SB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 4722                      **Located On:** RIVER DR  
**Collection Type**                      **Direction** SB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	12	10	0	0	0	0	11
1am to 2am	0	10	8	0	0	0	0	9
2am to 3am	0	3	7	0	0	0	0	5
3am to 4am	0	15	18	0	0	0	0	17
4am to 5am	0	34	30	0	0	0	0	32
5am to 6am	0	117	121	0	0	0	0	119
6am to 7am	0	281	285	0	0	0	0	283
7am to 8am	0	456	436	0	0	0	0	446
8am to 9am	0	252	285	0	0	0	0	269
9am to 10am	0	208	203	0	0	0	0	206
10am to 11am	0	215	211	0	0	0	0	213
11am to 12pm	0	203	220	0	0	0	0	212
12pm to 1pm	0	294	329	0	0	0	0	312
1pm to 2pm	0	289	269	0	0	0	0	279
2pm to 3pm	0	247	229	0	0	0	0	238
3pm to 4pm	0	275	260	0	0	0	0	268
4pm to 5pm	0	221	252	0	0	0	0	237
5pm to 6pm	0	277	299	0	0	0	0	288
6pm to 7pm	0	165	193	0	0	0	0	179
7pm to 8pm	0	118	128	0	0	0	0	123
8pm to 9pm	0	67	89	0	0	0	0	78
9pm to 10pm	0	58	67	0	0	0	0	63
10pm to 11pm	0	38	30	0	0	0	0	34
11pm to 12am	0	21	15	0	0	0	0	18
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>3,876</b>	<b>3,994</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,935</b>
<b>% of AADT</b>	<b>0.0</b>	<b>82.1</b>	<b>84.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-028                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 11111                      **Located On:** US 87  
**Collection Type**                      **Direction** 2-WAY                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	62	76	0	0	0	0	69
1am to 2am	0	60	75	0	0	0	0	67
2am to 3am	0	42	42	0	0	0	0	42
3am to 4am	0	44	43	0	0	0	0	43
4am to 5am	0	51	58	0	0	0	0	55
5am to 6am	0	216	222	0	0	0	0	219
6am to 7am	0	453	463	0	0	0	0	458
7am to 8am	0	754	743	0	0	0	0	748
8am to 9am	0	639	652	0	0	0	0	645
9am to 10am	0	662	631	0	0	0	0	646
10am to 11am	0	711	654	0	0	0	0	682
11am to 12pm	0	833	856	0	0	0	0	844
12pm to 1pm	0	972	979	0	0	0	0	975
1pm to 2pm	0	885	870	0	0	0	0	877
2pm to 3pm	0	848	870	0	0	0	0	859
3pm to 4pm	0	956	968	0	0	0	0	962
4pm to 5pm	0	1,002	1,017	0	0	0	0	1,009
5pm to 6pm	0	1,020	1,061	0	0	0	0	1,040
6pm to 7pm	0	627	663	0	0	0	0	645
7pm to 8pm	0	475	531	0	0	0	0	503
8pm to 9pm	0	408	456	0	0	0	0	432
9pm to 10pm	0	316	333	0	0	0	0	324
10pm to 11pm	0	205	218	0	0	0	0	211
11pm to 12am	0	110	129	0	0	0	0	120
# Days	0	2	2	0	0	0	0	4
Avg Daily Total	0	12,341	12,604	0	0	0	0	12,473
% of AADT	0.0	111.1	113.4	0.0	0.0	0.0	0.0	



**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-028\_NB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 6365                      **Located On:** US 87  
**Collection Type**                      **Direction** NB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	34	44	0	0	0	0	39
1am to 2am	0	26	34	0	0	0	0	30
2am to 3am	0	26	23	0	0	0	0	24
3am to 4am	0	26	24	0	0	0	0	25
4am to 5am	0	27	33	0	0	0	0	30
5am to 6am	0	152	161	0	0	0	0	156
6am to 7am	0	285	308	0	0	0	0	297
7am to 8am	0	437	437	0	0	0	0	437
8am to 9am	0	371	379	0	0	0	0	375
9am to 10am	0	383	378	0	0	0	0	380
10am to 11am	0	436	387	0	0	0	0	411
11am to 12pm	0	477	499	0	0	0	0	488
12pm to 1pm	0	580	579	0	0	0	0	580
1pm to 2pm	0	510	508	0	0	0	0	509
2pm to 3pm	0	523	538	0	0	0	0	531
3pm to 4pm	0	567	578	0	0	0	0	572
4pm to 5pm	0	627	638	0	0	0	0	632
5pm to 6pm	0	626	667	0	0	0	0	646
6pm to 7pm	0	373	382	0	0	0	0	377
7pm to 8pm	0	293	329	0	0	0	0	311
8pm to 9pm	0	226	259	0	0	0	0	243
9pm to 10pm	0	178	189	0	0	0	0	184
10pm to 11pm	0	121	132	0	0	0	0	126
11pm to 12am	0	58	72	0	0	0	0	65
<b># Days</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>7,357</b>	<b>7,573</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7,465</b>
<b>% of AADT</b>	<b>0.0</b>	<b>115.6</b>	<b>119.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-028\_SB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 4269                      **Located On:** US 87  
**Collection Type**                      **Direction** SB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	28	32	0	0	0	0	30
1am to 2am	0	34	41	0	0	0	0	38
2am to 3am	0	16	19	0	0	0	0	18
3am to 4am	0	18	19	0	0	0	0	19
4am to 5am	0	25	25	0	0	0	0	25
5am to 6am	0	64	61	0	0	0	0	63
6am to 7am	0	168	155	0	0	0	0	161
7am to 8am	0	317	307	0	0	0	0	312
8am to 9am	0	268	274	0	0	0	0	271
9am to 10am	0	279	253	0	0	0	0	266
10am to 11am	0	275	267	0	0	0	0	271
11am to 12pm	0	356	357	0	0	0	0	357
12pm to 1pm	0	392	400	0	0	0	0	396
1pm to 2pm	0	375	363	0	0	0	0	369
2pm to 3pm	0	325	332	0	0	0	0	328
3pm to 4pm	0	389	390	0	0	0	0	390
4pm to 5pm	0	375	379	0	0	0	0	377
5pm to 6pm	0	394	394	0	0	0	0	394
6pm to 7pm	0	254	282	0	0	0	0	268
7pm to 8pm	0	182	202	0	0	0	0	192
8pm to 9pm	0	182	197	0	0	0	0	189
9pm to 10pm	0	138	144	0	0	0	0	141
10pm to 11pm	0	84	86	0	0	0	0	85
11pm to 12am	0	52	57	0	0	0	0	55
# Days	0	2	2	0	0	0	0	4
Avg Daily Total	0	4,984	5,031	0	0	0	0	5,008
% of AADT	0.0	116.7	117.8	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
Criteria: From To From To From To From To

District                      Location ID 07-2A-029                      Community -                      Roadbed ML  
County CASCADE                      AADT                      14339                      Located On: US 87  
Collection Type                      Direction 2-WAY                      Route

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	61	83	0	0	0	0	72
1am to 2am	0	83	93	0	0	0	0	88
2am to 3am	0	43	41	0	0	0	0	42
3am to 4am	0	58	60	0	0	0	0	59
4am to 5am	0	82	93	0	0	0	0	88
5am to 6am	0	326	335	0	0	0	0	331
6am to 7am	0	729	766	0	0	0	0	748
7am to 8am	0	1,013	1,079	0	0	0	0	1,046
8am to 9am	0	769	790	0	0	0	0	780
9am to 10am	0	777	704	0	0	0	0	741
10am to 11am	0	843	762	0	0	0	0	803
11am to 12pm	0	925	1,015	0	0	0	0	970
12pm to 1pm	0	1,111	1,070	0	0	0	0	1,091
1pm to 2pm	0	990	1,018	0	0	0	0	1,004
2pm to 3pm	0	984	1,030	0	0	0	0	1,007
3pm to 4pm	0	1,176	1,179	0	0	0	0	1,178
4pm to 5pm	0	1,332	1,395	0	0	0	0	1,364
5pm to 6pm	0	1,279	1,409	0	0	0	0	1,344
6pm to 7pm	0	766	822	0	0	0	0	794
7pm to 8pm	0	575	646	0	0	0	0	611
8pm to 9pm	0	465	609	0	0	0	0	537
9pm to 10pm	0	399	468	0	0	0	0	434
10pm to 11pm	0	239	263	0	0	0	0	251
11pm to 12am	0	110	139	0	0	0	0	125
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	15,135	15,869	0	0	0	0	15,502
% of AADT	0.0	105.6	110.7	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-029\_NB                      **Community** -                      **Roadbed** ML  
**County** CASCADE                      **AADT** 6255                      **Located On:** US 87  
**Collection Type**                      **Direction** NB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	21	35	0	0	0	0	28
1am to 2am	0	48	50	0	0	0	0	49
2am to 3am	0	16	17	0	0	0	0	17
3am to 4am	0	27	34	0	0	0	0	31
4am to 5am	0	46	47	0	0	0	0	47
5am to 6am	0	133	137	0	0	0	0	135
6am to 7am	0	417	414	0	0	0	0	416
7am to 8am	0	545	604	0	0	0	0	575
8am to 9am	0	392	393	0	0	0	0	393
9am to 10am	0	386	353	0	0	0	0	370
10am to 11am	0	389	351	0	0	0	0	370
11am to 12pm	0	436	490	0	0	0	0	463
12pm to 1pm	0	502	478	0	0	0	0	490
1pm to 2pm	0	437	479	0	0	0	0	458
2pm to 3pm	0	436	422	0	0	0	0	429
3pm to 4pm	0	540	505	0	0	0	0	523
4pm to 5pm	0	550	561	0	0	0	0	556
5pm to 6pm	0	527	609	0	0	0	0	568
6pm to 7pm	0	336	367	0	0	0	0	352
7pm to 8pm	0	248	289	0	0	0	0	269
8pm to 9pm	0	204	259	0	0	0	0	232
9pm to 10pm	0	166	179	0	0	0	0	173
10pm to 11pm	0	91	111	0	0	0	0	101
11pm to 12am	0	42	56	0	0	0	0	49
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>6,935</b>	<b>7,240</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7,088</b>
<b>% of AADT</b>	<b>0.0</b>	<b>110.9</b>	<b>115.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	



**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-029\_SB                      **Community** -                      **Roadbed** ML  
**County** CASCADE                      **AADT** 7424                      **Located On:** US 87  
**Collection Type**                      **Direction** SB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	40	48	0	0	0	0	44
1am to 2am	0	35	43	0	0	0	0	39
2am to 3am	0	27	24	0	0	0	0	26
3am to 4am	0	31	26	0	0	0	0	29
4am to 5am	0	36	46	0	0	0	0	41
5am to 6am	0	193	198	0	0	0	0	196
6am to 7am	0	312	352	0	0	0	0	332
7am to 8am	0	468	475	0	0	0	0	472
8am to 9am	0	377	397	0	0	0	0	387
9am to 10am	0	391	351	0	0	0	0	371
10am to 11am	0	454	411	0	0	0	0	433
11am to 12pm	0	489	525	0	0	0	0	507
12pm to 1pm	0	609	592	0	0	0	0	601
1pm to 2pm	0	553	539	0	0	0	0	546
2pm to 3pm	0	548	608	0	0	0	0	578
3pm to 4pm	0	636	674	0	0	0	0	655
4pm to 5pm	0	782	834	0	0	0	0	808
5pm to 6pm	0	752	800	0	0	0	0	776
6pm to 7pm	0	430	455	0	0	0	0	443
7pm to 8pm	0	327	357	0	0	0	0	342
8pm to 9pm	0	261	350	0	0	0	0	306
9pm to 10pm	0	233	289	0	0	0	0	261
10pm to 11pm	0	148	152	0	0	0	0	150
11pm to 12am	0	68	83	0	0	0	0	76
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>8,200</b>	<b>8,629</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,415</b>
<b>% of AADT</b>	<b>0.0</b>	<b>110.5</b>	<b>116.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

<b>District</b>		<b>Location ID</b>	07-2A-120	<b>Community</b>	GREAT FALLS	<b>Roadbed</b>	ML
<b>County</b>	CASCADE	<b>AADT</b>	4798	<b>Located On:</b>	25TH ST		
<b>Collection Type</b>		<b>Direction</b>	2-WAY	<b>Route</b>			

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	18	20	0	0	0	0	19
1am to 2am	0	14	12	0	0	0	0	13
2am to 3am	0	15	5	0	0	0	0	10
3am to 4am	0	12	15	0	0	0	0	14
4am to 5am	0	22	22	0	0	0	0	22
5am to 6am	0	73	88	0	0	0	0	81
6am to 7am	0	199	216	0	0	0	0	208
7am to 8am	0	392	412	0	0	0	0	402
8am to 9am	0	371	335	0	0	0	0	353
9am to 10am	0	256	285	0	0	0	0	271
10am to 11am	0	305	291	0	0	0	0	298
11am to 12pm	0	309	326	0	0	0	0	318
12pm to 1pm	0	418	391	0	0	0	0	405
1pm to 2pm	0	359	371	0	0	0	0	365
2pm to 3pm	0	328	332	0	0	0	0	330
3pm to 4pm	0	467	421	0	0	0	0	444
4pm to 5pm	0	404	415	0	0	0	0	410
5pm to 6pm	0	477	439	0	0	0	0	458
6pm to 7pm	0	313	330	0	0	0	0	322
7pm to 8pm	0	216	241	0	0	0	0	229
8pm to 9pm	0	125	161	0	0	0	0	143
9pm to 10pm	0	82	102	0	0	0	0	92
10pm to 11pm	0	47	58	0	0	0	0	53
11pm to 12am	0	43	26	0	0	0	0	35
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>5,265</b>	<b>5,314</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,290</b>
<b>% of AADT</b>	<b>0.0</b>	<b>109.7</b>	<b>110.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-120\_NB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 1658                      **Located On:** 25TH ST  
**Collection Type**                      **Direction** NB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	8	10	0	0	0	0	9
1am to 2am	0	2	3	0	0	0	0	3
2am to 3am	0	2	2	0	0	0	0	2
3am to 4am	0	7	5	0	0	0	0	6
4am to 5am	0	10	12	0	0	0	0	11
5am to 6am	0	32	37	0	0	0	0	35
6am to 7am	0	74	82	0	0	0	0	78
7am to 8am	0	118	115	0	0	0	0	117
8am to 9am	0	118	106	0	0	0	0	112
9am to 10am	0	88	99	0	0	0	0	94
10am to 11am	0	117	99	0	0	0	0	108
11am to 12pm	0	108	117	0	0	0	0	113
12pm to 1pm	0	158	139	0	0	0	0	149
1pm to 2pm	0	135	127	0	0	0	0	131
2pm to 3pm	0	113	111	0	0	0	0	112
3pm to 4pm	0	165	124	0	0	0	0	145
4pm to 5pm	0	142	132	0	0	0	0	137
5pm to 6pm	0	152	138	0	0	0	0	145
6pm to 7pm	0	115	113	0	0	0	0	114
7pm to 8pm	0	93	99	0	0	0	0	96
8pm to 9pm	0	45	55	0	0	0	0	50
9pm to 10pm	0	23	45	0	0	0	0	34
10pm to 11pm	0	19	12	0	0	0	0	16
11pm to 12am	0	18	12	0	0	0	0	15
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	1,862	1,794	0	0	0	0	1,828
% of AADT	0.0	112.3	108.2	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-120\_SB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 3140                      **Located On:** 25TH ST  
**Collection Type**                      **Direction** SB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	10	10	0	0	0	0	10
1am to 2am	0	12	9	0	0	0	0	11
2am to 3am	0	13	3	0	0	0	0	8
3am to 4am	0	5	10	0	0	0	0	8
4am to 5am	0	12	10	0	0	0	0	11
5am to 6am	0	41	51	0	0	0	0	46
6am to 7am	0	125	134	0	0	0	0	130
7am to 8am	0	274	297	0	0	0	0	286
8am to 9am	0	253	229	0	0	0	0	241
9am to 10am	0	168	186	0	0	0	0	177
10am to 11am	0	188	192	0	0	0	0	190
11am to 12pm	0	201	209	0	0	0	0	205
12pm to 1pm	0	260	252	0	0	0	0	256
1pm to 2pm	0	224	244	0	0	0	0	234
2pm to 3pm	0	215	221	0	0	0	0	218
3pm to 4pm	0	302	297	0	0	0	0	300
4pm to 5pm	0	262	283	0	0	0	0	273
5pm to 6pm	0	325	301	0	0	0	0	313
6pm to 7pm	0	198	217	0	0	0	0	208
7pm to 8pm	0	123	142	0	0	0	0	133
8pm to 9pm	0	80	106	0	0	0	0	93
9pm to 10pm	0	59	57	0	0	0	0	58
10pm to 11pm	0	28	46	0	0	0	0	37
11pm to 12am	0	25	14	0	0	0	0	20
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>3,403</b>	<b>3,520</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,462</b>
<b>% of AADT</b>	<b>0.0</b>	<b>108.4</b>	<b>112.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	



**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**  
**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-124                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 4211                      **Located On:** 38TH ST  
**Collection Type**                      **Direction** 2-WAY                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	15	13	0	0	0	0	14
1am to 2am	0	12	13	0	0	0	0	13
2am to 3am	0	10	9	0	0	0	0	10
3am to 4am	0	5	10	0	0	0	0	8
4am to 5am	0	20	20	0	0	0	0	20
5am to 6am	0	91	90	0	0	0	0	91
6am to 7am	0	181	169	0	0	0	0	175
7am to 8am	0	333	326	0	0	0	0	330
8am to 9am	0	293	247	0	0	0	0	270
9am to 10am	0	203	196	0	0	0	0	200
10am to 11am	0	247	224	0	0	0	0	236
11am to 12pm	0	246	245	0	0	0	0	246
12pm to 1pm	0	279	315	0	0	0	0	297
1pm to 2pm	0	292	280	0	0	0	0	286
2pm to 3pm	0	321	336	0	0	0	0	329
3pm to 4pm	0	337	346	0	0	0	0	342
4pm to 5pm	0	407	443	0	0	0	0	425
5pm to 6pm	0	483	477	0	0	0	0	480
6pm to 7pm	0	336	329	0	0	0	0	333
7pm to 8pm	0	236	242	0	0	0	0	239
8pm to 9pm	0	128	144	0	0	0	0	136
9pm to 10pm	0	107	87	0	0	0	0	97
10pm to 11pm	0	37	54	0	0	0	0	46
11pm to 12am	0	34	18	0	0	0	0	26
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	4,653	4,633	0	0	0	0	4,643
% of AADT	0.0	110.5	110.0	0.0	0.0	0.0	0.0	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-124\_NB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 32                      **Located On:** 38TH ST  
**Collection Type**                      **Direction** NB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	9	5	0	0	0	0	7
1am to 2am	0	7	7	0	0	0	0	7
2am to 3am	0	3	4	0	0	0	0	4
3am to 4am	0	4	6	0	0	0	0	5
4am to 5am	0	6	6	0	0	0	0	6
5am to 6am	0	50	48	0	0	0	0	49
6am to 7am	0	128	117	0	0	0	0	123
7am to 8am	0	192	198	0	0	0	0	195
8am to 9am	0	168	137	0	0	0	0	153
9am to 10am	0	113	99	0	0	0	0	106
10am to 11am	0	126	119	0	0	0	0	123
11am to 12pm	0	113	124	0	0	0	0	119
12pm to 1pm	0	133	144	0	0	0	0	139
1pm to 2pm	0	134	129	0	0	0	0	132
2pm to 3pm	0	156	161	0	0	0	0	159
3pm to 4pm	0	167	164	0	0	0	0	166
4pm to 5pm	0	183	179	0	0	0	0	181
5pm to 6pm	0	188	190	0	0	0	0	189
6pm to 7pm	0	125	162	0	0	0	0	144
7pm to 8pm	0	117	110	0	0	0	0	114
8pm to 9pm	0	46	56	0	0	0	0	51
9pm to 10pm	0	64	37	0	0	0	0	51
10pm to 11pm	0	10	25	0	0	0	0	18
11pm to 12am	0	18	9	0	0	0	0	14
<b># Days</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Avg Daily Total</b>	<b>0</b>	<b>2,260</b>	<b>2,236</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,248</b>
<b>% of AADT</b>	<b>0.0</b>	<b>7062.5</b>	<b>6987.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	

**Avg Hourly Traffic by Day of Week for 1/1/2015 - 12/31/2015**

**Criteria: From To From To From To From To**

**District**                      **Location ID** 07-2A-124\_SB                      **Community** GREAT FALLS                      **Roadbed** ML  
**County** CASCADE                      **AADT** 30                      **Located On:** 38TH ST  
**Collection Type**                      **Direction** SB                      **Route**

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Avg Daily
12am to 1am	0	6	8	0	0	0	0	7
1am to 2am	0	5	6	0	0	0	0	6
2am to 3am	0	7	5	0	0	0	0	6
3am to 4am	0	1	4	0	0	0	0	3
4am to 5am	0	14	14	0	0	0	0	14
5am to 6am	0	41	42	0	0	0	0	42
6am to 7am	0	53	52	0	0	0	0	53
7am to 8am	0	141	128	0	0	0	0	135
8am to 9am	0	125	110	0	0	0	0	118
9am to 10am	0	90	97	0	0	0	0	94
10am to 11am	0	121	105	0	0	0	0	113
11am to 12pm	0	133	121	0	0	0	0	127
12pm to 1pm	0	146	171	0	0	0	0	159
1pm to 2pm	0	158	151	0	0	0	0	155
2pm to 3pm	0	165	175	0	0	0	0	170
3pm to 4pm	0	170	182	0	0	0	0	176
4pm to 5pm	0	224	264	0	0	0	0	244
5pm to 6pm	0	295	287	0	0	0	0	291
6pm to 7pm	0	211	167	0	0	0	0	189
7pm to 8pm	0	119	132	0	0	0	0	126
8pm to 9pm	0	82	88	0	0	0	0	85
9pm to 10pm	0	43	50	0	0	0	0	47
10pm to 11pm	0	27	29	0	0	0	0	28
11pm to 12am	0	16	9	0	0	0	0	13
# Days	0	1	1	0	0	0	0	2
Avg Daily Total	0	2,393	2,397	0	0	0	0	2,395
% of AADT	0.0	7976.7	7990.0	0.0	0.0	0.0	0.0	

**Location: #07-2A-129 - Giant Springs Rd north of River Dr North/O/mc - Average Daily Traffic (ADT)**

May 2015	17 Sun	18 Mon	19 Tues	20 Wed	21 Thu	22 Fri	23 Sat	Total	Daily Average	Weekday Average	Weekend Avg
00:00-00:59	0	0	1	1	0	0	0	2	1	1	0
01:00-01:59	0	0	1	0	0	0	0	1	1	1	0
02:00-02:59	0	0	3	3	0	0	0	6	3	3	0
03:00-03:59	0	0	0	1	0	0	0	1	1	1	0
04:00-04:59	0	0	0	4	0	0	0	4	2	2	0
05:00-05:59	0	0	5	7	0	0	0	12	6	6	0
06:00-06:59	0	0	18	22	0	0	0	40	20	20	0
07:00-07:59	0	0	27	41	0	0	0	68	34	34	0
08:00-08:59	0	0	77	74	0	0	0	151	76	76	0
09:00-09:59	0	0	71	77	0	0	0	148	74	74	0
10:00-10:59	0	0	64	75	0	0	0	139	70	70	0
11:00-11:59	0	0	65	93	0	0	0	158	79	79	0
12:00-12:59	0	0	114	128	0	0	0	242	121	121	0
13:00-13:59	0	0	84	119	0	0	0	203	102	102	0
14:00-14:59	0	0	114	114	0	0	0	228	114	114	0
15:00-15:59	0	0	84	104	0	0	0	188	94	94	0
16:00-16:59	0	0	111	131	0	0	0	242	121	121	0
17:00-17:59	0	0	134	148	0	0	0	282	141	141	0
18:00-18:59	0	0	99	132	0	0	0	231	116	116	0
19:00-19:59	0	0	77	104	0	0	0	181	91	91	0
20:00-20:59	0	0	69	80	0	0	0	149	75	75	0
21:00-21:59	0	0	34	30	0	0	0	64	32	32	0
22:00-22:59	0	0	10	25	0	0	0	35	18	18	0
23:00-23:59	0	0	0	5	0	0	0	5	3	3	0
Totals	0	0	1262	1518	0	0	0	2780	1390	1390	0
Peak Hour #of Veh	5pm to 6pm 141										
Seasonal Adjustment factor			0.88						Adjusted ADT	1223	



Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 1

Location: 47.519454131055, -  
111.281587779522

## Turning Movement Data

Start Time	07-2A-058 Westbound					07-2A-057 Eastbound					07-2A-029 Southbound					07-2A-028 Northbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
6:15 AM	4	19	29	0	52	1	39	14	0	54	84	21	0	0	105	16	37	8	0	61	272
6:30 AM	1	28	50	0	79	5	76	11	0	92	79	36	3	0	118	18	52	10	0	80	369
6:45 AM	3	19	30	0	52	5	50	11	0	66	84	31	3	0	118	19	55	14	0	88	324
Hourly Total	8	66	109	0	183	11	165	36	0	212	247	88	6	0	341	53	144	32	0	229	965
7:00 AM	4	21	35	0	60	4	90	13	0	107	85	37	5	0	127	18	41	13	0	72	366
7:15 AM	1	32	47	1	80	6	84	19	0	109	84	47	1	0	132	16	51	13	2	80	401
7:30 AM	2	46	76	1	124	5	90	18	3	113	114	66	6	0	186	33	86	16	1	135	558
7:45 AM	4	41	54	0	99	5	96	27	0	128	60	38	2	0	100	19	58	17	0	94	421
Hourly Total	11	140	212	2	363	20	360	77	3	457	343	188	14	0	545	86	236	59	3	381	1746
8:00 AM	3	38	40	1	81	7	57	16	2	80	61	33	3	0	97	13	37	9	0	59	317
8:15 AM	3	35	45	3	83	2	51	13	0	66	50	47	2	0	99	13	44	11	0	68	316
8:30 AM	5	35	46	1	86	1	52	16	0	69	62	35	1	0	98	18	48	12	0	78	331
8:45 AM	3	39	51	0	93	4	45	13	0	62	51	42	5	0	98	21	52	14	0	87	340
Hourly Total	14	147	182	5	343	14	205	58	2	277	224	157	11	0	392	65	181	46	0	292	1304
9:00 AM	7	38	38	0	83	1	59	10	1	70	33	41	1	0	75	15	53	13	0	81	309
9:15 AM	5	41	43	0	89	3	50	10	0	63	61	39	7	0	107	19	44	7	0	70	329
9:30 AM	3	39	52	0	94	3	58	26	2	87	59	46	7	0	112	26	49	11	0	86	379
9:45 AM	5	48	51	0	104	3	54	20	0	77	44	44	4	0	92	18	51	12	0	81	354
Hourly Total	20	166	184	0	370	10	221	66	3	297	197	170	19	0	386	78	197	43	0	318	1371
10:00 AM	5	41	52	0	98	5	64	18	0	87	68	40	1	0	109	34	62	11	0	107	401
10:15 AM	5	43	42	1	90	7	60	17	0	84	50	51	6	0	107	26	51	7	0	84	365
10:30 AM	8	41	40	0	89	6	38	18	0	62	54	37	2	0	93	33	71	12	0	116	360
10:45 AM	13	44	54	0	111	2	75	12	1	89	41	37	2	0	80	21	62	7	0	90	370
Hourly Total	31	169	188	1	388	20	237	65	1	322	213	165	11	0	389	114	246	37	0	397	1496
11:00 AM	14	57	61	1	132	3	54	25	0	82	52	47	3	0	102	26	68	10	0	104	420
11:15 AM	9	46	53	0	108	3	70	27	0	100	50	39	4	0	93	26	49	10	0	85	386
11:30 AM	12	49	53	2	114	3	71	20	0	94	61	42	0	2	103	26	71	9	0	106	417
11:45 AM	7	54	42	0	103	2	69	25	0	96	75	55	8	0	138	24	81	12	0	117	454
Hourly Total	42	206	209	3	457	11	264	97	0	372	238	183	15	2	436	102	269	41	0	412	1677
12:00 PM	11	45	75	0	131	5	64	26	0	95	58	58	8	0	124	36	84	20	0	140	490
12:15 PM	14	54	66	1	134	4	65	14	0	83	65	54	4	0	123	38	70	19	0	127	467
12:30 PM	7	50	52	0	109	6	72	28	0	106	70	60	4	0	134	39	88	27	0	154	503
12:45 PM	12	44	72	1	128	6	74	21	0	101	69	51	1	0	121	38	81	20	0	139	489
Hourly Total	44	193	265	2	502	21	275	89	0	385	262	223	17	0	502	151	323	86	0	560	1949
1:00 PM	9	40	53	0	102	5	73	29	0	107	65	45	3	0	113	30	86	14	0	130	452
1:15 PM	12	62	55	1	129	0	59	21	0	80	65	58	3	0	126	26	68	11	0	105	440
1:30 PM	7	66	76	1	149	0	74	30	0	104	51	55	2	0	108	34	85	18	0	137	498
1:45 PM	13	61	51	0	125	0	89	28	0	117	46	41	3	0	90	27	74	12	0	113	445
Hourly Total	41	229	235	2	505	5	295	108	0	408	227	199	11	0	437	117	313	55	0	485	1835
2:00 PM	12	51	39	0	102	0	74	19	0	93	51	45	8	0	104	32	81	14	0	127	426
2:15 PM	9	71	60	1	140	2	75	31	0	108	63	41	3	0	107	27	80	16	0	123	478

2:30 PM	9	83	67	3	159	6	81	25	0	112	69	44	3	0	116	38	79	7	0	124	511
2:45 PM	13	69	63	4	145	3	80	19	1	102	55	48	6	0	109	20	68	13	0	101	457
Hourly Total	43	274	229	8	546	11	310	94	1	415	238	178	20	0	436	117	308	50	0	475	1872
3:00 PM	9	53	73	2	135	2	81	18	0	101	79	59	3	0	141	28	98	13	0	139	516
3:15 PM	8	57	58	0	123	4	83	27	0	114	88	60	3	0	151	22	75	17	0	114	502
3:30 PM	7	57	67	1	131	6	78	27	0	111	64	58	4	0	126	25	92	9	0	126	494
3:45 PM	9	53	72	2	134	1	69	27	2	97	69	45	8	0	122	31	88	19	2	138	491
Hourly Total	33	220	270	5	523	13	311	99	2	423	300	222	18	0	540	106	353	58	2	517	2003
4:00 PM	5	67	83	2	155	4	92	33	0	129	59	51	10	0	120	36	103	19	0	158	562
4:15 PM	13	88	90	0	191	5	65	24	2	94	68	58	3	0	129	27	94	14	0	135	549
4:30 PM	9	85	88	1	182	1	78	25	0	104	77	64	5	0	146	40	111	17	0	168	600
4:45 PM	5	94	87	0	186	5	105	26	0	136	88	59	8	0	155	32	111	9	0	152	629
Hourly Total	32	334	348	3	714	15	340	108	2	463	292	232	26	0	550	135	419	59	0	613	2340
5:00 PM	14	94	112	1	220	1	69	26	3	96	100	61	4	0	165	35	149	24	0	208	689
5:15 PM	5	64	92	4	161	1	99	17	0	117	71	37	11	0	119	32	85	14	0	131	528
5:30 PM	8	68	74	4	150	4	100	32	0	136	76	59	2	0	137	28	89	12	0	129	552
5:45 PM	5	53	62	0	120	4	69	28	0	101	62	43	1	0	106	24	79	11	0	114	441
Hourly Total	32	279	340	9	651	10	337	103	3	450	309	200	18	0	527	119	402	61	0	582	2210
6:00 PM	8	41	53	0	102	2	58	16	0	76	46	35	6	0	87	22	66	9	0	97	362
6:15 PM	3	43	44	0	90	1	77	12	0	90	39	43	3	0	85	8	64	13	0	85	350
6:30 PM	6	37	45	0	88	0	63	14	0	77	38	38	2	0	78	17	55	5	0	77	320
6:45 PM	3	22	45	0	70	1	56	14	0	71	48	37	1	0	86	15	54	8	0	77	304
Hourly Total	20	143	187	0	350	4	254	56	0	314	171	153	12	0	336	62	239	35	0	336	1336
7:00 PM	2	29	36	0	67	1	49	18	2	68	33	25	2	0	60	17	58	3	0	78	273
7:15 PM	5	32	36	0	73	1	43	9	0	53	41	23	1	0	65	11	34	7	0	52	243
7:30 PM	5	26	33	0	64	4	46	20	0	70	38	25	3	0	66	12	49	3	0	64	264
7:45 PM	3	30	27	0	60	0	37	13	0	50	32	25	0	0	57	20	48	4	0	72	239
Hourly Total	15	117	132	0	264	6	175	60	2	241	144	98	6	0	248	60	189	17	0	266	1019
8:00 PM	4	26	24	0	54	1	45	7	1	53	36	29	2	0	67	11	38	4	0	53	227
8:15 PM	8	26	33	0	67	3	38	19	0	60	24	24	3	0	51	13	39	4	0	56	234
8:30 PM	2	35	24	0	61	1	31	13	3	45	29	14	1	0	44	6	31	7	0	44	194
8:45 PM	5	32	34	1	71	1	31	9	0	41	21	20	1	0	42	17	32	3	0	52	206
Hourly Total	19	119	115	1	253	6	145	48	4	199	110	87	7	0	204	47	140	18	0	205	861
9:00 PM	1	20	23	0	44	0	32	14	0	46	28	24	0	0	52	7	31	3	0	41	183
9:15 PM	2	13	25	1	40	2	30	11	0	43	24	12	0	0	36	8	31	5	0	44	163
9:30 PM	6	22	24	0	52	0	21	11	0	32	17	28	3	0	48	8	34	3	0	45	177
9:45 PM	3	28	33	0	64	1	19	7	0	27	16	14	0	0	30	9	29	5	0	43	164
Hourly Total	12	83	105	1	200	3	102	43	0	148	85	78	3	0	166	32	125	16	0	173	687
10:00 PM	4	18	18	2	40	0	15	6	0	21	17	7	0	0	24	9	30	7	0	46	131
10:15 PM	1	12	16	0	29	0	14	6	1	20	13	12	0	0	25	2	19	3	0	24	98
10:30 PM	3	11	14	0	28	0	10	2	3	12	16	12	1	2	29	3	24	2	0	29	98
10:45 PM	0	10	15	3	25	0	14	5	0	19	6	6	1	0	13	1	11	1	0	13	70
Hourly Total	8	51	63	5	122	0	53	19	4	72	52	37	2	2	91	15	84	13	0	112	397
11:00 PM	1	12	10	1	23	0	14	5	0	19	5	8	0	0	13	4	11	1	0	16	71
11:15 PM	0	5	6	1	11	2	6	5	0	13	6	7	0	0	13	3	12	2	0	17	54
11:30 PM	2	4	2	0	8	0	8	1	0	9	3	8	0	0	11	0	13	1	0	14	42
11:45 PM	0	1	6	0	7	0	4	2	0	6	2	1	2	0	5	0	6	4	0	10	28
Hourly Total	3	22	24	2	49	2	32	13	0	47	16	24	2	0	42	7	42	8	0	57	195
12:00 AM	0	4	5	1	9	2	3	2	0	7	4	5	0	0	9	4	10	0	0	14	39
12:15 AM	1	1	1	0	3	0	11	2	0	13	2	0	0	0	2	0	5	2	0	7	25
12:30 AM	2	4	6	0	12	0	6	2	0	8	2	2	0	0	4	2	5	0	0	7	31
12:45 AM	0	4	4	0	8	0	5	2	0	7	1	5	0	0	6	0	2	1	0	3	24

Hourly Total	3	13	16	1	32	2	25	8	0	35	9	12	0	0	21	6	22	3	0	31	119
1:00 AM	0	3	3	1	6	0	4	1	1	5	4	3	0	0	7	1	3	0	1	4	22
1:15 AM	0	0	3	0	3	0	3	1	0	4	4	2	0	0	6	1	3	1	0	5	18
1:30 AM	0	2	5	0	7	0	1	2	0	3	4	5	0	0	9	0	6	0	0	6	25
1:45 AM	0	1	3	0	4	0	3	0	0	3	11	15	0	0	26	1	9	2	0	12	45
Hourly Total	0	6	14	1	20	0	11	4	1	15	23	25	0	0	48	3	21	3	1	27	110
2:00 AM	0	0	3	0	3	0	3	0	0	3	2	3	0	0	5	0	3	0	0	3	14
2:15 AM	2	1	2	0	5	0	2	2	0	4	1	3	0	0	4	1	7	1	0	9	22
2:30 AM	1	0	2	0	3	0	1	5	0	6	3	0	0	0	3	1	5	0	0	6	18
2:45 AM	0	1	2	0	3	0	0	0	0	0	3	1	0	0	4	1	3	1	0	5	12
Hourly Total	3	2	9	0	14	0	6	7	0	13	9	7	0	0	16	3	18	2	0	23	66
3:00 AM	0	1	2	0	3	0	4	0	0	4	3	0	0	0	3	3	3	0	0	6	16
3:15 AM	0	0	0	0	0	0	4	2	0	6	1	4	0	0	5	1	6	2	0	9	20
3:30 AM	0	0	8	0	8	0	10	2	0	12	8	1	0	0	9	0	5	3	0	8	37
3:45 AM	0	2	4	0	6	0	4	3	0	7	4	6	0	0	10	0	3	1	0	4	27
Hourly Total	0	3	14	0	17	0	22	7	0	29	16	11	0	0	27	4	17	6	0	27	100
4:00 AM	2	3	0	0	5	1	5	1	0	7	5	1	0	0	6	1	1	1	0	3	21
4:15 AM	0	4	1	0	5	1	4	2	1	7	4	0	1	0	5	2	4	2	0	8	25
4:30 AM	1	3	5	0	9	1	5	2	0	8	8	11	0	0	19	0	4	3	0	7	43
4:45 AM	0	1	7	0	8	2	11	3	0	16	10	6	0	0	16	2	9	1	0	12	52
Hourly Total	3	11	13	0	27	5	25	8	1	38	27	18	1	0	46	5	18	7	0	30	141
5:00 AM	2	9	12	0	23	0	8	4	0	12	11	6	0	0	17	5	8	4	0	17	69
5:15 AM	1	6	18	1	25	0	16	9	0	25	18	5	0	0	23	8	18	5	0	31	104
5:30 AM	1	8	31	6	40	2	34	6	1	42	43	10	2	0	55	4	41	15	0	60	197
5:45 AM	1	18	38	1	57	1	36	6	1	43	27	11	0	0	38	7	24	11	0	42	180
Hourly Total	5	41	99	8	145	3	94	25	2	122	99	32	2	0	133	24	91	35	0	150	550
6:00 AM	2	19	30	1	51	2	34	6	1	42	51	24	1	0	76	10	16	6	0	32	201
6:15 AM	2	22	29	0	53	2	48	9	0	59	74	19	1	0	94	20	39	8	0	67	273
6:30 AM	2	22	52	0	76	3	72	13	0	88	85	29	2	0	116	12	63	9	0	84	364
6:45 AM	4	22	36	0	62	5	46	14	0	65	96	32	5	0	133	14	63	17	0	94	354
Hourly Total	10	85	147	1	242	12	200	42	1	254	306	104	9	0	419	56	181	40	0	277	1192
7:00 AM	3	26	38	0	67	4	84	11	0	99	90	44	4	0	138	16	51	9	0	76	380
7:15 AM	2	30	54	1	86	6	87	15	0	108	94	51	5	0	150	12	47	10	0	69	413
7:30 AM	2	44	72	1	118	4	100	31	0	135	120	58	4	0	182	27	78	18	0	123	558
7:45 AM	5	44	54	0	103	1	81	29	0	111	89	42	3	0	134	17	66	10	0	93	441
Hourly Total	12	144	218	2	374	15	352	86	0	453	393	195	16	0	604	72	242	47	0	361	1792
8:00 AM	2	35	43	0	80	3	45	11	0	59	62	40	1	0	103	20	45	15	0	80	322
8:15 AM	8	33	46	0	87	4	54	8	0	66	51	28	4	0	83	24	50	9	0	83	319
8:30 AM	3	37	48	0	88	6	61	14	0	81	54	50	2	0	106	26	51	7	0	84	359
8:45 AM	5	41	36	0	82	4	43	21	1	68	52	44	5	0	101	18	61	6	0	85	336
Hourly Total	18	146	173	0	337	17	203	54	1	274	219	162	12	0	393	88	207	37	0	332	1336
9:00 AM	3	47	43	0	93	2	45	9	0	56	54	40	4	0	98	16	51	14	0	81	328
9:15 AM	6	48	33	0	87	2	43	17	0	62	31	49	4	0	84	22	50	8	0	80	313
9:30 AM	2	37	38	1	77	3	62	25	0	90	54	26	3	0	83	25	37	19	0	81	331
9:45 AM	3	53	42	0	98	2	52	16	0	70	48	37	3	0	88	17	48	17	0	82	338
Hourly Total	14	185	156	1	355	9	202	67	0	278	187	152	14	0	353	80	186	58	0	324	1310
10:00 AM	3	48	32	0	83	0	56	13	0	69	55	33	5	0	93	22	57	8	0	87	332
10:15 AM	10	59	27	0	96	5	66	19	0	90	39	35	1	0	75	24	47	10	0	81	342
10:30 AM	11	49	47	1	107	3	60	15	0	78	55	34	2	0	91	22	67	10	0	99	375
10:45 AM	9	53	62	0	124	4	80	23	0	107	54	35	3	0	92	30	60	16	0	106	429
Hourly Total	33	209	168	1	410	12	262	70	0	344	203	137	11	0	351	98	231	44	0	373	1478
11:00 AM	13	39	65	0	117	4	72	21	0	97	52	45	0	0	97	30	76	12	0	118	429

11:15 AM	14	67	48	1	129	2	71	24	1	97	74	58	5	0	137	22	64	12	0	98	461
11:30 AM	9	52	52	0	113	4	77	22	0	103	62	48	6	0	116	36	82	17	0	135	467
11:45 AM	12	59	57	0	128	7	58	24	0	89	69	68	3	0	140	41	64	20	0	125	482
Hourly Total	48	217	222	1	487	17	278	91	1	386	257	219	14	0	490	129	286	61	0	476	1839
12:00 PM	11	40	53	2	104	4	79	19	0	102	56	59	2	0	117	42	90	19	0	151	474
12:15 PM	14	49	58	2	121	3	83	23	0	109	49	51	3	0	103	29	75	18	0	122	455
12:30 PM	6	68	73	0	147	4	67	28	0	99	77	58	7	0	142	36	83	7	0	126	514
12:45 PM	16	45	71	2	132	0	71	28	0	99	57	58	1	0	116	23	78	18	0	119	466
Hourly Total	47	202	255	6	504	11	300	98	0	409	239	226	13	0	478	130	326	62	0	518	1909
1:00 PM	10	58	72	2	140	6	82	28	0	116	70	45	6	0	121	18	79	16	1	113	490
1:15 PM	10	55	48	0	113	1	57	24	0	82	58	64	5	0	127	39	71	24	0	134	456
1:30 PM	11	48	63	0	122	4	76	17	0	97	65	44	5	0	114	23	74	12	0	109	442
1:45 PM	10	45	53	1	108	3	80	20	0	103	60	49	8	0	117	26	63	14	0	103	431
Hourly Total	41	206	236	3	483	14	295	89	0	398	253	202	24	0	479	106	287	66	1	459	1819
2:00 PM	4	75	53	0	132	3	85	26	0	114	63	39	6	0	108	27	79	19	0	125	479
2:15 PM	10	65	69	0	144	7	82	29	0	118	53	39	6	0	98	28	72	16	0	116	476
2:30 PM	8	69	75	0	152	3	75	32	0	110	54	43	5	0	102	28	92	12	0	132	496
2:45 PM	7	63	75	1	145	6	70	25	0	101	65	42	7	0	114	27	74	12	0	113	473
Hourly Total	29	272	272	1	573	19	312	112	0	443	235	163	24	0	422	110	317	59	0	486	1924
3:00 PM	15	58	68	0	141	1	63	20	0	84	69	54	3	0	126	37	107	10	0	154	505
3:15 PM	6	66	78	0	150	5	75	22	0	102	66	58	5	0	129	25	83	16	0	124	505
3:30 PM	12	64	75	0	151	3	62	22	0	87	62	48	4	0	114	30	93	13	0	136	488
3:45 PM	6	80	72	0	158	4	66	22	0	92	78	54	4	0	136	33	85	17	0	135	521
Hourly Total	39	268	293	0	600	13	266	86	0	365	275	214	16	0	505	125	368	56	0	549	2019
4:00 PM	12	61	90	0	163	3	95	31	0	129	58	49	0	0	107	28	109	21	0	158	557
4:15 PM	13	74	94	0	181	4	70	22	0	96	86	60	9	0	155	36	98	12	0	146	578
4:30 PM	15	82	100	1	197	4	98	22	0	124	84	53	5	0	142	40	119	17	0	176	639
4:45 PM	12	93	113	1	218	4	88	32	1	124	94	57	6	0	157	37	96	17	0	150	649
Hourly Total	52	310	397	2	759	15	351	107	1	473	322	219	20	0	561	141	422	67	0	630	2423
5:00 PM	8	89	128	2	225	6	84	22	0	112	105	70	10	1	185	49	140	11	0	200	722
5:15 PM	7	76	97	7	180	7	84	24	0	115	84	44	6	0	134	36	118	13	0	167	596
5:30 PM	5	60	74	0	139	4	100	21	1	125	87	75	6	0	168	35	83	21	0	139	571
5:45 PM	4	49	60	0	113	2	72	25	1	99	74	43	5	0	122	33	81	8	0	122	456
Hourly Total	24	274	359	9	657	19	340	92	2	451	350	232	27	1	609	153	422	53	0	628	2345
6:00 PM	7	44	51	2	102	3	83	22	0	108	54	52	3	0	109	15	71	11	0	97	416
6:15 PM	5	32	43	0	80	5	59	21	0	85	57	34	2	0	93	13	77	9	0	99	357
6:30 PM	4	32	52	0	88	4	74	18	0	96	62	23	4	0	89	21	55	11	0	87	360
6:45 PM	6	30	49	0	85	0	64	15	0	79	39	37	0	0	76	19	45	12	0	76	316
Hourly Total	22	138	195	2	355	12	280	76	0	368	212	146	9	0	367	68	248	43	0	359	1449
7:00 PM	6	37	44	1	87	1	56	13	0	70	39	20	2	0	61	19	66	17	0	102	320
7:15 PM	6	34	25	1	65	3	54	8	0	65	37	40	2	0	79	11	45	6	0	62	271
7:30 PM	5	25	45	0	75	1	60	9	0	70	35	41	3	0	79	7	42	8	0	57	281
7:45 PM	6	32	39	0	77	2	42	12	1	56	35	33	2	0	70	10	44	8	0	62	265
Hourly Total	23	128	153	2	304	7	212	42	1	261	146	134	9	0	289	47	197	39	0	283	1137
8:00 PM	3	22	52	0	77	1	43	16	0	60	28	29	2	0	59	12	45	6	0	63	259
8:15 PM	4	30	29	0	63	4	40	12	0	56	24	42	3	0	69	7	53	2	0	62	250
8:30 PM	8	31	33	0	72	1	37	6	3	44	35	24	4	0	63	9	45	9	0	63	242
8:45 PM	5	32	35	0	72	0	33	13	1	46	44	22	2	0	68	5	52	2	0	59	245
Hourly Total	20	115	149	0	284	6	153	47	4	206	131	117	11	0	259	33	195	19	0	247	996
9:00 PM	7	35	60	0	102	1	33	12	0	46	23	20	1	0	44	10	45	5	0	60	252
9:15 PM	4	43	41	0	88	1	27	11	0	39	36	23	1	0	60	5	29	5	0	39	226
9:30 PM	3	43	44	1	90	0	15	7	0	22	21	20	0	0	41	7	30	5	0	42	195



9:45 PM	0	13	17	0	30	2	24	9	0	35	16	16	2	0	34	10	19	4	0	33	132
Hourly Total	14	134	162	1	310	4	99	39	0	142	96	79	4	0	179	32	123	19	0	174	805
10:00 PM	0	19	23	0	42	0	30	6	3	36	17	15	0	0	32	4	26	2	0	32	142
10:15 PM	2	10	19	1	31	0	14	4	1	18	26	11	0	0	37	4	24	5	0	33	119
10:30 PM	0	6	15	0	21	0	22	4	0	26	10	10	1	0	21	4	20	1	0	25	93
10:45 PM	0	7	11	0	18	3	10	10	1	23	14	6	1	0	21	4	11	3	0	18	80
Hourly Total	2	42	68	1	112	3	76	24	5	103	67	42	2	0	111	16	81	11	0	108	434
11:00 PM	0	6	11	0	17	1	6	9	1	16	8	9	0	0	17	1	14	3	0	18	68
11:15 PM	0	0	6	0	6	1	10	10	0	21	5	10	0	0	15	3	11	4	0	18	60
11:30 PM	1	3	8	0	12	0	8	2	0	10	7	8	1	0	16	0	10	6	0	16	54
11:45 PM	1	5	4	0	10	0	3	2	0	5	2	5	1	0	8	2	17	2	0	21	44
Hourly Total	2	14	29	0	45	2	27	23	1	52	22	32	2	0	56	6	52	15	0	73	226
12:00 AM	0	7	7	0	14	0	4	2	0	6	9	4	0	0	13	9	9	0	0	18	51
12:15 AM	0	2	5	0	7	0	4	3	0	7	4	4	0	0	8	2	5	1	0	8	30
12:30 AM	1	5	4	0	10	0	7	2	0	9	2	4	0	0	6	3	7	0	0	10	35
12:45 AM	0	1	6	0	7	0	7	5	0	12	5	3	0	0	8	1	5	0	0	6	33
Hourly Total	1	15	22	0	38	0	22	12	0	34	20	15	0	0	35	15	26	1	0	42	149
1:00 AM	3	2	3	0	8	0	6	3	0	9	1	2	0	0	3	1	9	1	0	11	31
1:15 AM	0	1	6	0	7	0	2	2	0	4	4	6	0	0	10	1	3	1	0	5	26
1:30 AM	0	3	4	0	7	0	5	1	0	6	5	6	0	0	11	1	9	1	0	11	35
1:45 AM	0	0	4	0	4	1	2	5	0	8	11	15	0	0	26	3	4	1	0	8	46
Hourly Total	3	6	17	0	26	1	15	11	0	27	21	29	0	0	50	6	25	4	0	35	138
2:00 AM	1	2	4	0	7	0	4	2	0	6	1	0	0	0	1	2	3	0	0	5	19
2:15 AM	1	4	1	0	6	0	1	3	0	4	1	6	0	0	7	2	5	2	0	9	26
2:30 AM	0	1	0	0	1	0	2	2	0	4	2	3	0	0	5	1	4	0	0	5	15
2:45 AM	0	2	5	0	7	0	4	0	0	4	1	3	0	0	4	0	2	1	0	3	18
Hourly Total	2	9	10	0	21	0	11	7	0	18	5	12	0	0	17	5	14	3	0	22	78
3:00 AM	0	0	0	0	0	0	5	0	0	5	1	3	0	0	4	1	3	0	0	4	13
3:15 AM	0	4	1	0	5	0	0	2	0	2	2	3	0	0	5	2	3	2	0	7	19
3:30 AM	0	1	3	0	4	0	7	2	0	9	7	4	0	0	11	0	7	3	0	10	34
3:45 AM	0	0	6	0	6	0	6	2	1	8	7	6	1	0	14	0	3	0	0	3	31
Hourly Total	0	5	10	0	15	0	18	6	1	24	17	16	1	0	34	3	16	5	0	24	97
4:00 AM	0	5	6	0	11	0	3	0	0	3	5	3	1	0	9	0	4	1	0	5	28
4:15 AM	0	1	1	0	2	0	8	2	0	10	5	1	0	0	6	2	5	0	0	7	25
4:30 AM	2	3	7	0	12	1	10	1	0	12	9	9	0	0	18	1	9	1	0	11	53
4:45 AM	0	4	10	0	14	1	10	2	0	13	9	5	0	0	14	3	2	2	0	7	48
Hourly Total	2	13	24	0	39	2	31	5	0	38	28	18	1	0	47	6	20	4	0	30	154
5:00 AM	1	5	14	0	20	0	15	6	0	21	10	6	0	0	16	3	10	3	0	16	73
5:15 AM	2	7	17	1	26	1	20	11	0	32	24	7	0	0	31	6	19	9	0	34	123
5:30 AM	2	10	45	4	57	1	41	3	2	45	46	9	0	0	55	11	39	12	0	62	219
5:45 AM	1	26	35	2	62	1	29	5	2	35	27	8	0	0	35	11	16	9	0	36	168
Hourly Total	6	48	111	7	165	3	105	25	4	133	107	30	0	0	137	31	84	33	0	148	583
6:00 AM	1	15	24	0	40	3	38	6	0	47	54	17	0	0	71	4	32	1	0	37	195
Grand Total	907	6234	7432	99	14573	408	8712	2615	53	11735	8016	5699	460	5	14175	3071	8985	1637	7	13693	54176
Approach %	6.2	42.8	51.0	-	-	3.5	74.2	22.3	-	-	56.6	40.2	3.2	-	-	22.4	65.6	12.0	-	-	-
Total %	1.7	11.5	13.7	-	26.9	0.8	16.1	4.8	-	21.7	14.8	10.5	0.8	-	26.2	5.7	16.6	3.0	-	25.3	-
Motorcycles	2	28	41	-	71	0	27	14	-	41	31	24	4	-	59	10	49	17	-	76	247
% Motorcycles	0.2	0.4	0.6	-	0.5	0.0	0.3	0.5	-	0.3	0.4	0.4	0.9	-	0.4	0.3	0.5	1.0	-	0.6	0.5
Cars	538	3571	4394	-	8503	182	5197	2025	-	7404	4662	3615	235	-	8512	2108	5678	916	-	8702	33121
% Cars	59.3	57.3	59.1	-	58.3	44.6	59.7	77.4	-	63.1	58.2	63.4	51.1	-	60.0	68.6	63.2	56.0	-	63.6	61.1
Light Goods Vehicles	303	2040	2635	-	4978	181	2773	451	-	3405	2831	1811	194	-	4836	790	2856	582	-	4228	17447

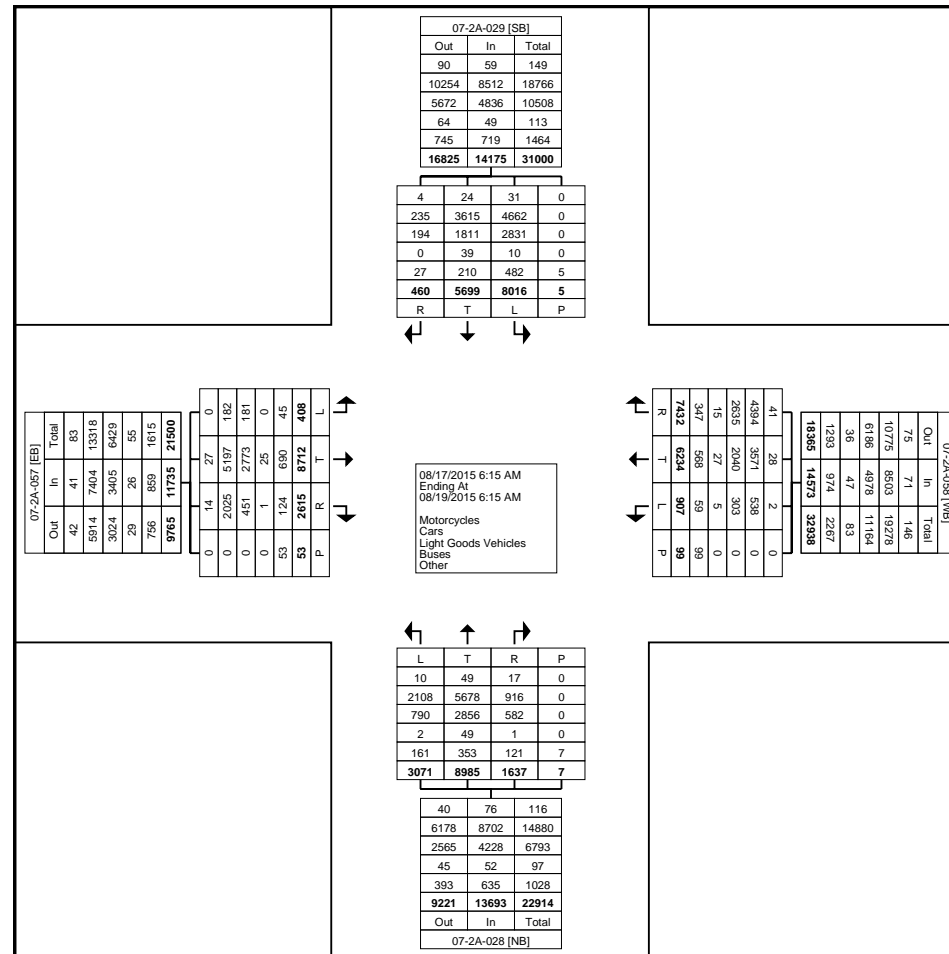
% Light Goods Vehicles	33.4	32.7	35.5	-	34.2	44.4	31.8	17.2	-	29.0	35.3	31.8	42.2	-	34.1	25.7	31.8	35.6	-	30.9	32.2
Buses	5	27	15	-	47	0	25	1	-	26	10	39	0	-	49	2	49	1	-	52	174
% Buses	0.6	0.4	0.2	-	0.3	0.0	0.3	0.0	-	0.2	0.1	0.7	0.0	-	0.3	0.1	0.5	0.1	-	0.4	0.3
Single-Unit Trucks	29	241	153	-	423	23	346	71	-	440	282	151	25	-	458	87	280	75	-	442	1763
% Single-Unit Trucks	3.2	3.9	2.1	-	2.9	5.6	4.0	2.7	-	3.7	3.5	2.6	5.4	-	3.2	2.8	3.1	4.6	-	3.2	3.3
Articulated Trucks	30	327	193	-	550	22	342	52	-	416	200	52	2	-	254	74	68	45	-	187	1407
% Articulated Trucks	3.3	5.2	2.6	-	3.8	5.4	3.9	2.0	-	3.5	2.5	0.9	0.4	-	1.8	2.4	0.8	2.7	-	1.4	2.6
Bicycles on Road	0	0	1	-	1	0	2	1	-	3	0	7	0	-	7	0	5	1	-	6	17
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.1	0.0	-	0.0	0.0	0.1	0.1	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	9	-	-	-	-	8	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	9.1	-	-	-	-	15.1	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	90	-	-	-	-	45	-	-	-	-	5	-	-	-	-	7	-	-
% Pedestrians	-	-	-	90.9	-	-	-	-	84.9	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 7

Location: 47.519454131055, -  
111.281587779522



Turning Movement Data Plot

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
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Site Code:  
Start Date: 08/17/2015  
Page No: 8

Location: 47.519454131055, -  
111.281587779522

### Turning Movement Peak Hour Data (7:00 AM)

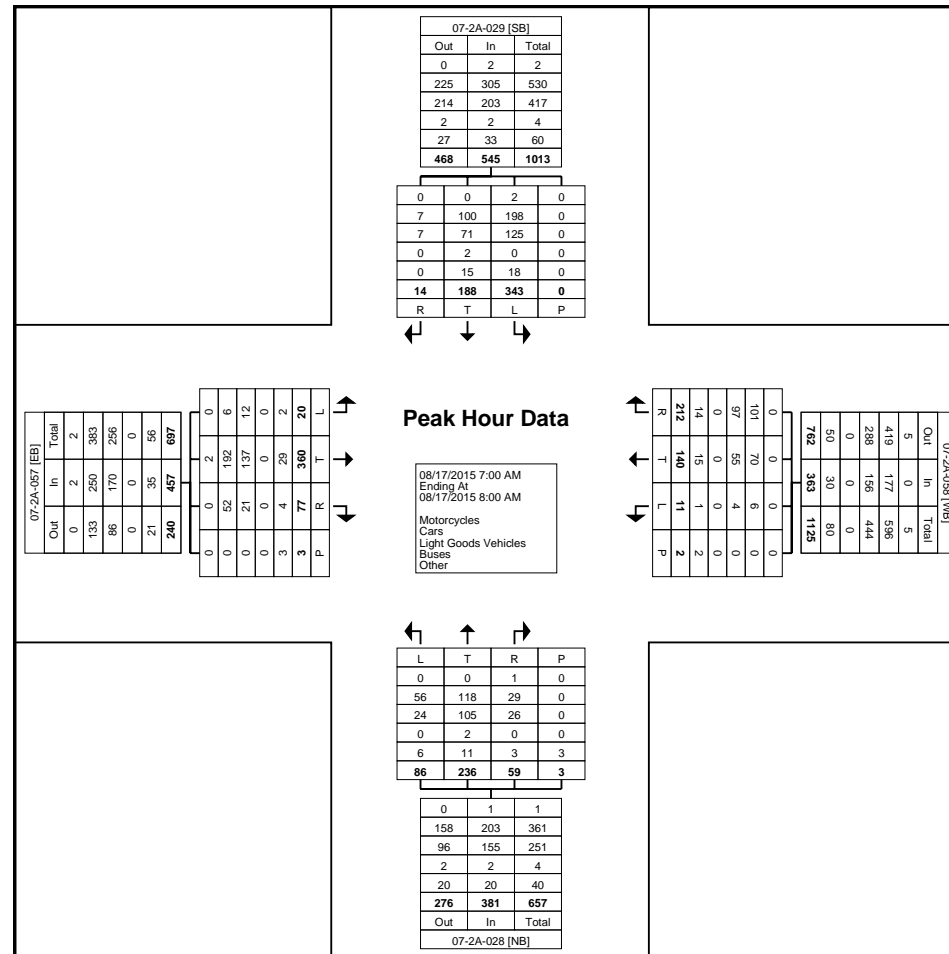
Start Time	07-2A-058 Westbound					07-2A-057 Eastbound					07-2A-029 Southbound					07-2A-028 Northbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	4	21	35	0	60	4	90	13	0	107	85	37	5	0	127	18	41	13	0	72	366
7:15 AM	1	32	47	1	80	6	84	19	0	109	84	47	1	0	132	16	51	13	2	80	401
7:30 AM	2	46	76	1	124	5	90	18	3	113	114	66	6	0	186	33	86	16	1	135	558
7:45 AM	4	41	54	0	99	5	96	27	0	128	60	38	2	0	100	19	58	17	0	94	421
Total	11	140	212	2	363	20	360	77	3	457	343	188	14	0	545	86	236	59	3	381	1746
Approach %	3.0	38.6	58.4	-	-	4.4	78.8	16.8	-	-	62.9	34.5	2.6	-	-	22.6	61.9	15.5	-	-	-
Total %	0.6	8.0	12.1	-	20.8	1.1	20.6	4.4	-	26.2	19.6	10.8	0.8	-	31.2	4.9	13.5	3.4	-	21.8	-
PHF	0.688	0.761	0.697	-	0.732	0.833	0.938	0.713	-	0.893	0.752	0.712	0.583	-	0.733	0.652	0.686	0.868	-	0.706	0.782
Motorcycles	0	0	0	-	0	0	2	0	-	2	2	0	0	-	2	0	0	1	-	1	5
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.6	0.0	-	0.4	0.6	0.0	0.0	-	0.4	0.0	0.0	1.7	-	0.3	0.3
Cars	6	70	101	-	177	6	192	52	-	250	198	100	7	-	305	56	118	29	-	203	935
% Cars	54.5	50.0	47.6	-	48.8	30.0	53.3	67.5	-	54.7	57.7	53.2	50.0	-	56.0	65.1	50.0	49.2	-	53.3	53.6
Light Goods Vehicles	4	55	97	-	156	12	137	21	-	170	125	71	7	-	203	24	105	26	-	155	684
% Light Goods Vehicles	36.4	39.3	45.8	-	43.0	60.0	38.1	27.3	-	37.2	36.4	37.8	50.0	-	37.2	27.9	44.5	44.1	-	40.7	39.2
Buses	0	0	0	-	0	0	0	0	-	0	0	2	0	-	2	0	2	0	-	2	4
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	1.1	0.0	-	0.4	0.0	0.8	0.0	-	0.5	0.2
Single-Unit Trucks	1	3	5	-	9	1	13	3	-	17	14	14	0	-	28	3	9	3	-	15	69
% Single-Unit Trucks	9.1	2.1	2.4	-	2.5	5.0	3.6	3.9	-	3.7	4.1	7.4	0.0	-	5.1	3.5	3.8	5.1	-	3.9	4.0
Articulated Trucks	0	12	9	-	21	1	16	1	-	18	4	1	0	-	5	3	2	0	-	5	49
% Articulated Trucks	0.0	8.6	4.2	-	5.8	5.0	4.4	1.3	-	3.9	1.2	0.5	0.0	-	0.9	3.5	0.8	0.0	-	1.3	2.8
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	50.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	1	-	-	-	-	3	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	50.0	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 9

Location: 47.519454131055, -  
111.281587779522



Turning Movement Peak Hour Data Plot (7:00 AM)



Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 10

Location: 47.519454131055, -  
111.281587779522

### Turning Movement Peak Hour Data (12:00 PM)

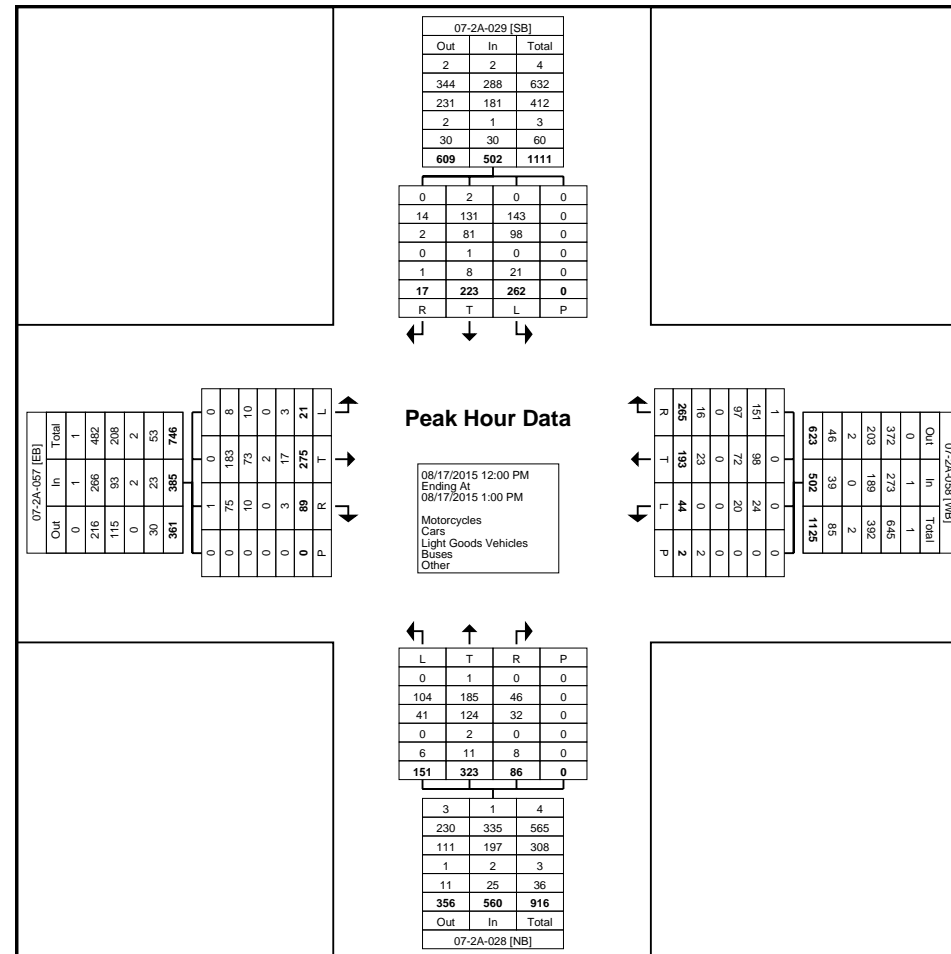
Start Time	07-2A-058 Westbound					07-2A-057 Eastbound					07-2A-029 Southbound					07-2A-028 Northbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
12:00 PM	11	45	75	0	131	5	64	26	0	95	58	58	8	0	124	36	84	20	0	140	490
12:15 PM	14	54	66	1	134	4	65	14	0	83	65	54	4	0	123	38	70	19	0	127	467
12:30 PM	7	50	52	0	109	6	72	28	0	106	70	60	4	0	134	39	88	27	0	154	503
12:45 PM	12	44	72	1	128	6	74	21	0	101	69	51	1	0	121	38	81	20	0	139	489
Total	44	193	265	2	502	21	275	89	0	385	262	223	17	0	502	151	323	86	0	560	1949
Approach %	8.8	38.4	52.8	-	-	5.5	71.4	23.1	-	-	52.2	44.4	3.4	-	-	27.0	57.7	15.4	-	-	-
Total %	2.3	9.9	13.6	-	25.8	1.1	14.1	4.6	-	19.8	13.4	11.4	0.9	-	25.8	7.7	16.6	4.4	-	28.7	-
PHF	0.786	0.894	0.883	-	0.937	0.875	0.929	0.795	-	0.908	0.936	0.929	0.531	-	0.937	0.968	0.918	0.796	-	0.909	0.969
Motorcycles	0	0	1	-	1	0	0	1	-	1	0	2	0	-	2	0	1	0	-	1	5
% Motorcycles	0.0	0.0	0.4	-	0.2	0.0	0.0	1.1	-	0.3	0.0	0.9	0.0	-	0.4	0.0	0.3	0.0	-	0.2	0.3
Cars	24	98	151	-	273	8	183	75	-	266	143	131	14	-	288	104	185	46	-	335	1162
% Cars	54.5	50.8	57.0	-	54.4	38.1	66.5	84.3	-	69.1	54.6	58.7	82.4	-	57.4	68.9	57.3	53.5	-	59.8	59.6
Light Goods Vehicles	20	72	97	-	189	10	73	10	-	93	98	81	2	-	181	41	124	32	-	197	660
% Light Goods Vehicles	45.5	37.3	36.6	-	37.6	47.6	26.5	11.2	-	24.2	37.4	36.3	11.8	-	36.1	27.2	38.4	37.2	-	35.2	33.9
Buses	0	0	0	-	0	0	2	0	-	2	0	1	0	-	1	0	2	0	-	2	5
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.7	0.0	-	0.5	0.0	0.4	0.0	-	0.2	0.0	0.6	0.0	-	0.4	0.3
Single-Unit Trucks	0	6	7	-	13	2	8	1	-	11	13	5	1	-	19	4	8	5	-	17	60
% Single-Unit Trucks	0.0	3.1	2.6	-	2.6	9.5	2.9	1.1	-	2.9	5.0	2.2	5.9	-	3.8	2.6	2.5	5.8	-	3.0	3.1
Articulated Trucks	0	17	9	-	26	1	9	2	-	12	8	3	0	-	11	2	3	3	-	8	57
% Articulated Trucks	0.0	8.8	3.4	-	5.2	4.8	3.3	2.2	-	3.1	3.1	1.3	0.0	-	2.2	1.3	0.9	3.5	-	1.4	2.9
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 11

Location: 47.519454131055, -  
111.281587779522



Turning Movement Peak Hour Data Plot (12:00 PM)

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 12

Location: 47.519454131055, -  
111.281587779522

### Turning Movement Peak Hour Data (4:15 PM)

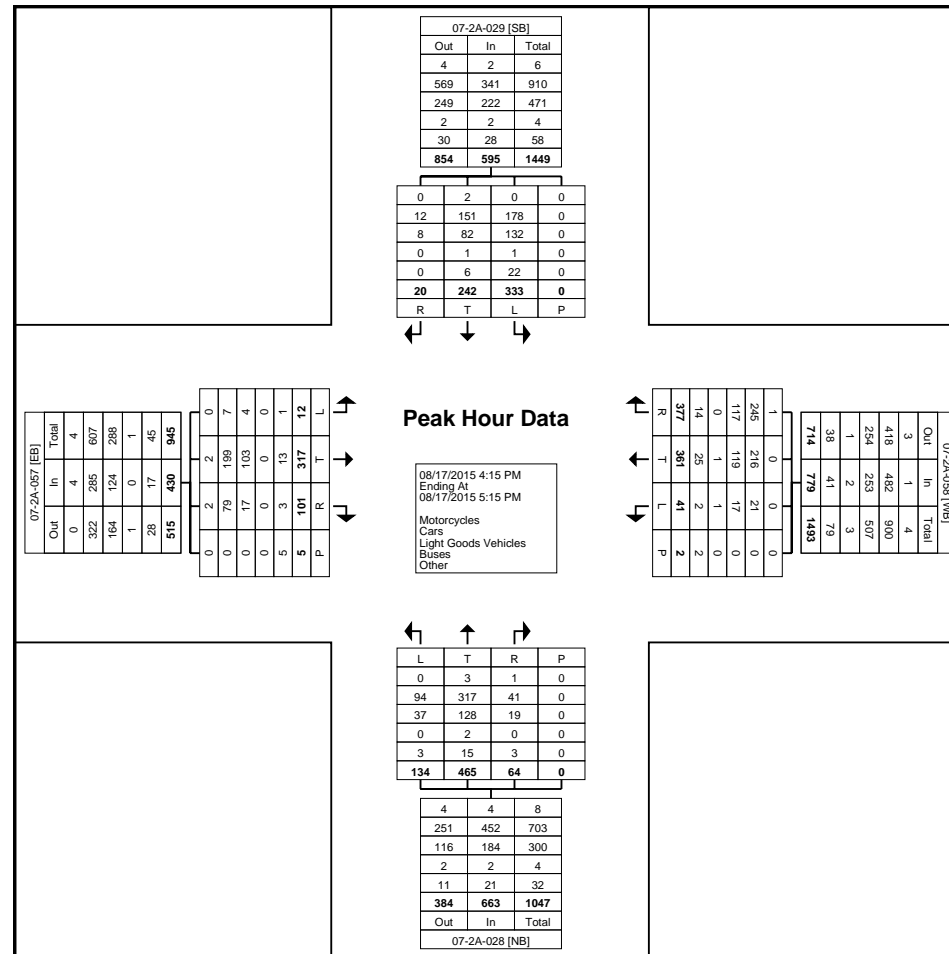
Start Time	07-2A-058 Westbound					07-2A-057 Eastbound					07-2A-029 Southbound					07-2A-028 Northbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
4:15 PM	13	88	90	0	191	5	65	24	2	94	68	58	3	0	129	27	94	14	0	135	549
4:30 PM	9	85	88	1	182	1	78	25	0	104	77	64	5	0	146	40	111	17	0	168	600
4:45 PM	5	94	87	0	186	5	105	26	0	136	88	59	8	0	155	32	111	9	0	152	629
5:00 PM	14	94	112	1	220	1	69	26	3	96	100	61	4	0	165	35	149	24	0	208	689
Total	41	361	377	2	779	12	317	101	5	430	333	242	20	0	595	134	465	64	0	663	2467
Approach %	5.3	46.3	48.4	-	-	2.8	73.7	23.5	-	-	56.0	40.7	3.4	-	-	20.2	70.1	9.7	-	-	-
Total %	1.7	14.6	15.3	-	31.6	0.5	12.8	4.1	-	17.4	13.5	9.8	0.8	-	24.1	5.4	18.8	2.6	-	26.9	-
PHF	0.732	0.960	0.842	-	0.885	0.600	0.755	0.971	-	0.790	0.833	0.945	0.625	-	0.902	0.838	0.780	0.667	-	0.797	0.895
Motorcycles	0	0	1	-	1	0	2	2	-	4	0	2	0	-	2	0	3	1	-	4	11
% Motorcycles	0.0	0.0	0.3	-	0.1	0.0	0.6	2.0	-	0.9	0.0	0.8	0.0	-	0.3	0.0	0.6	1.6	-	0.6	0.4
Cars	21	216	245	-	482	7	199	79	-	285	178	151	12	-	341	94	317	41	-	452	1560
% Cars	51.2	59.8	65.0	-	61.9	58.3	62.8	78.2	-	66.3	53.5	62.4	60.0	-	57.3	70.1	68.2	64.1	-	68.2	63.2
Light Goods Vehicles	17	119	117	-	253	4	103	17	-	124	132	82	8	-	222	37	128	19	-	184	783
% Light Goods Vehicles	41.5	33.0	31.0	-	32.5	33.3	32.5	16.8	-	28.8	39.6	33.9	40.0	-	37.3	27.6	27.5	29.7	-	27.8	31.7
Buses	1	1	0	-	2	0	0	0	-	0	1	1	0	-	2	0	2	0	-	2	6
% Buses	2.4	0.3	0.0	-	0.3	0.0	0.0	0.0	-	0.0	0.3	0.4	0.0	-	0.3	0.0	0.4	0.0	-	0.3	0.2
Single-Unit Trucks	1	12	9	-	22	1	7	1	-	9	13	3	0	-	16	0	13	2	-	15	62
% Single-Unit Trucks	2.4	3.3	2.4	-	2.8	8.3	2.2	1.0	-	2.1	3.9	1.2	0.0	-	2.7	0.0	2.8	3.1	-	2.3	2.5
Articulated Trucks	1	13	5	-	19	0	6	2	-	8	9	3	0	-	12	3	2	1	-	6	45
% Articulated Trucks	2.4	3.6	1.3	-	2.4	0.0	1.9	2.0	-	1.9	2.7	1.2	0.0	-	2.0	2.2	0.4	1.6	-	0.9	1.8
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	4	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	50.0	-	-	-	-	80.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	50.0	-	-	-	-	20.0	-	-	-	-	-	-	-	-	-	-	-	-

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
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Location: 47.519454131055, -  
111.281587779522



Turning Movement Peak Hour Data Plot (4:15 PM)

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 14

Location: 47.519454131055, -  
111.281587779522

### Turning Movement Peak Hour Data (7:00 AM)

Start Time	07-2A-058 Westbound					07-2A-057 Eastbound					07-2A-029 Southbound					07-2A-028 Northbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	3	26	38	0	67	4	84	11	0	99	90	44	4	0	138	16	51	9	0	76	380
7:15 AM	2	30	54	1	86	6	87	15	0	108	94	51	5	0	150	12	47	10	0	69	413
7:30 AM	2	44	72	1	118	4	100	31	0	135	120	58	4	0	182	27	78	18	0	123	558
7:45 AM	5	44	54	0	103	1	81	29	0	111	89	42	3	0	134	17	66	10	0	93	441
Total	12	144	218	2	374	15	352	86	0	453	393	195	16	0	604	72	242	47	0	361	1792
Approach %	3.2	38.5	58.3	-	-	3.3	77.7	19.0	-	-	65.1	32.3	2.6	-	-	19.9	67.0	13.0	-	-	-
Total %	0.7	8.0	12.2	-	20.9	0.8	19.6	4.8	-	25.3	21.9	10.9	0.9	-	33.7	4.0	13.5	2.6	-	20.1	-
PHF	0.600	0.818	0.757	-	0.792	0.625	0.880	0.694	-	0.839	0.819	0.841	0.800	-	0.830	0.667	0.776	0.653	-	0.734	0.803
Motorcycles	0	0	0	-	0	0	1	0	-	1	2	1	0	-	3	0	1	1	-	2	6
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.3	0.0	-	0.2	0.5	0.5	0.0	-	0.5	0.0	0.4	2.1	-	0.6	0.3
Cars	3	89	117	-	209	6	191	60	-	257	228	122	7	-	357	44	121	24	-	189	1012
% Cars	25.0	61.8	53.7	-	55.9	40.0	54.3	69.8	-	56.7	58.0	62.6	43.8	-	59.1	61.1	50.0	51.1	-	52.4	56.5
Light Goods Vehicles	8	43	87	-	138	9	134	19	-	162	136	57	6	-	199	20	99	19	-	138	637
% Light Goods Vehicles	66.7	29.9	39.9	-	36.9	60.0	38.1	22.1	-	35.8	34.6	29.2	37.5	-	32.9	27.8	40.9	40.4	-	38.2	35.5
Buses	0	0	0	-	0	0	3	0	-	3	4	2	0	-	6	0	2	0	-	2	11
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.9	0.0	-	0.7	1.0	1.0	0.0	-	1.0	0.0	0.8	0.0	-	0.6	0.6
Single-Unit Trucks	1	5	8	-	14	0	12	6	-	18	18	10	2	-	30	6	15	2	-	23	85
% Single-Unit Trucks	8.3	3.5	3.7	-	3.7	0.0	3.4	7.0	-	4.0	4.6	5.1	12.5	-	5.0	8.3	6.2	4.3	-	6.4	4.7
Articulated Trucks	0	7	6	-	13	0	11	1	-	12	5	3	1	-	9	2	4	1	-	7	41
% Articulated Trucks	0.0	4.9	2.8	-	3.5	0.0	3.1	1.2	-	2.6	1.3	1.5	6.3	-	1.5	2.8	1.7	2.1	-	1.9	2.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

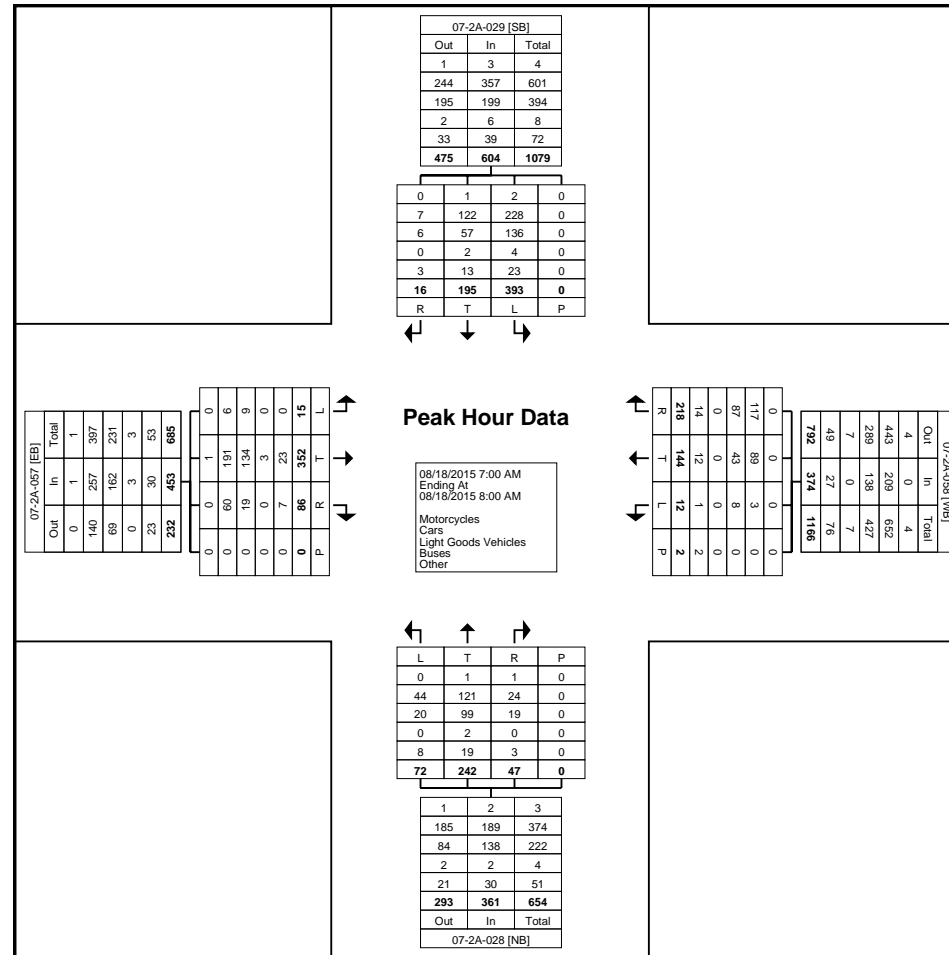


Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
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Location: 47.519454131055, -  
111.281587779522



Turning Movement Peak Hour Data Plot (7:00 AM)

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 16

Location: 47.519454131055, -  
111.281587779522

### Turning Movement Peak Hour Data (12:30 PM)

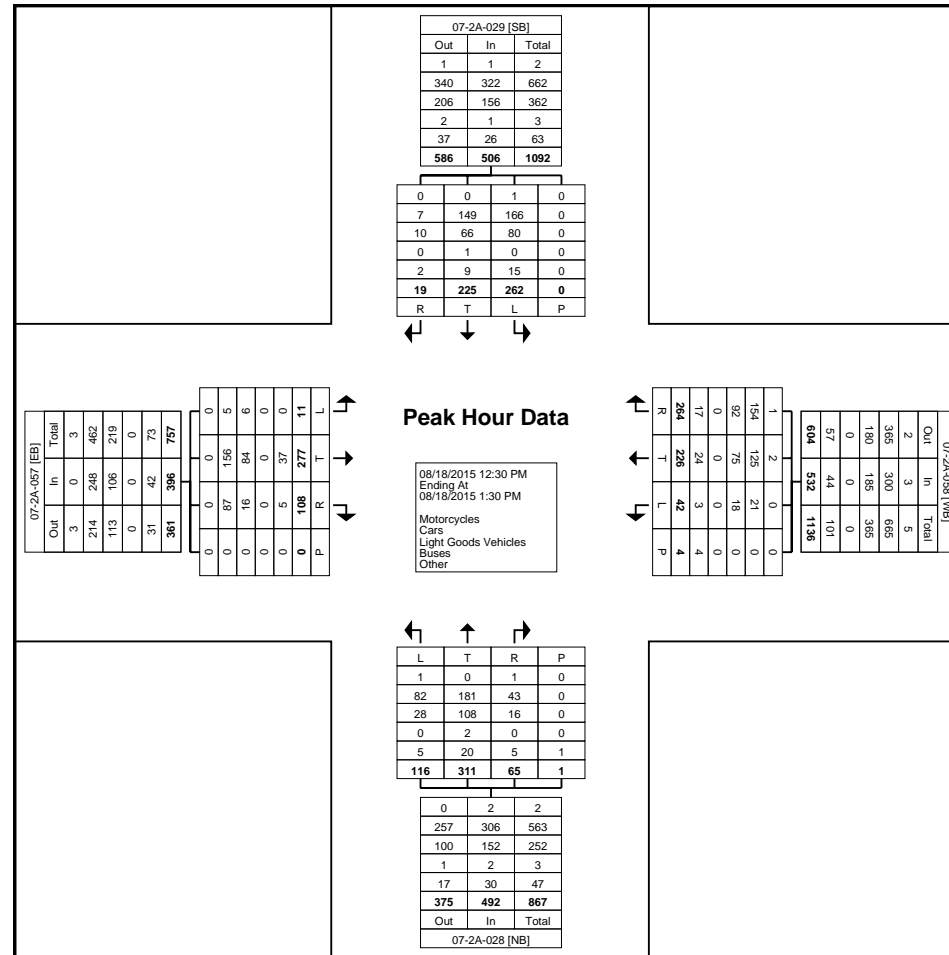
Start Time	07-2A-058 Westbound					07-2A-057 Eastbound					07-2A-029 Southbound					07-2A-028 Northbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
12:30 PM	6	68	73	0	147	4	67	28	0	99	77	58	7	0	142	36	83	7	0	126	514
12:45 PM	16	45	71	2	132	0	71	28	0	99	57	58	1	0	116	23	78	18	0	119	466
1:00 PM	10	58	72	2	140	6	82	28	0	116	70	45	6	0	121	18	79	16	1	113	490
1:15 PM	10	55	48	0	113	1	57	24	0	82	58	64	5	0	127	39	71	24	0	134	456
Total	42	226	264	4	532	11	277	108	0	396	262	225	19	0	506	116	311	65	1	492	1926
Approach %	7.9	42.5	49.6	-	-	2.8	69.9	27.3	-	-	51.8	44.5	3.8	-	-	23.6	63.2	13.2	-	-	-
Total %	2.2	11.7	13.7	-	27.6	0.6	14.4	5.6	-	20.6	13.6	11.7	1.0	-	26.3	6.0	16.1	3.4	-	25.5	-
PHF	0.656	0.831	0.904	-	0.905	0.458	0.845	0.964	-	0.853	0.851	0.879	0.679	-	0.891	0.744	0.937	0.677	-	0.918	0.937
Motorcycles	0	2	1	-	3	0	0	0	-	0	1	0	0	-	1	1	0	1	-	2	6
% Motorcycles	0.0	0.9	0.4	-	0.6	0.0	0.0	0.0	-	0.0	0.4	0.0	0.0	-	0.2	0.9	0.0	1.5	-	0.4	0.3
Cars	21	125	154	-	300	5	156	87	-	248	166	149	7	-	322	82	181	43	-	306	1176
% Cars	50.0	55.3	58.3	-	56.4	45.5	56.3	80.6	-	62.6	63.4	66.2	36.8	-	63.6	70.7	58.2	66.2	-	62.2	61.1
Light Goods Vehicles	18	75	92	-	185	6	84	16	-	106	80	66	10	-	156	28	108	16	-	152	599
% Light Goods Vehicles	42.9	33.2	34.8	-	34.8	54.5	30.3	14.8	-	26.8	30.5	29.3	52.6	-	30.8	24.1	34.7	24.6	-	30.9	31.1
Buses	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	0	2	0	-	2	3
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.4	0.0	-	0.2	0.0	0.6	0.0	-	0.4	0.2
Single-Unit Trucks	2	7	7	-	16	0	18	4	-	22	9	8	2	-	19	4	17	3	-	24	81
% Single-Unit Trucks	4.8	3.1	2.7	-	3.0	0.0	6.5	3.7	-	5.6	3.4	3.6	10.5	-	3.8	3.4	5.5	4.6	-	4.9	4.2
Articulated Trucks	1	17	10	-	28	0	19	1	-	20	6	1	0	-	7	1	3	2	-	6	61
% Articulated Trucks	2.4	7.5	3.8	-	5.3	0.0	6.9	0.9	-	5.1	2.3	0.4	0.0	-	1.4	0.9	1.0	3.1	-	1.2	3.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	4	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 17

Location: 47.519454131055, -  
111.281587779522



Turning Movement Peak Hour Data Plot (12:30 PM)

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 18

Location: 47.519454131055, -  
111.281587779522

### Turning Movement Peak Hour Data (4:30 PM)

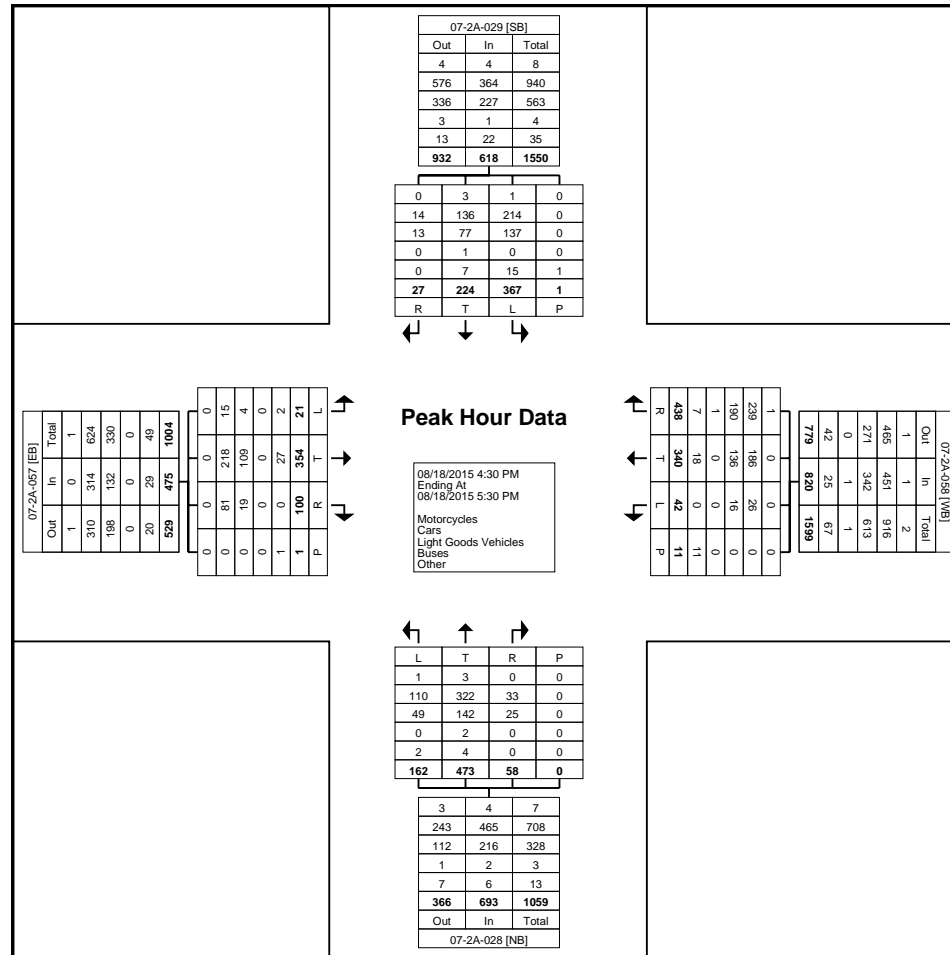
Start Time	07-2A-058 Westbound					07-2A-057 Eastbound					07-2A-029 Southbound					07-2A-028 Northbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
4:30 PM	15	82	100	1	197	4	98	22	0	124	84	53	5	0	142	40	119	17	0	176	639
4:45 PM	12	93	113	1	218	4	88	32	1	124	94	57	6	0	157	37	96	17	0	150	649
5:00 PM	8	89	128	2	225	6	84	22	0	112	105	70	10	1	185	49	140	11	0	200	722
5:15 PM	7	76	97	7	180	7	84	24	0	115	84	44	6	0	134	36	118	13	0	167	596
Total	42	340	438	11	820	21	354	100	1	475	367	224	27	1	618	162	473	58	0	693	2606
Approach %	5.1	41.5	53.4	-	-	4.4	74.5	21.1	-	-	59.4	36.2	4.4	-	-	23.4	68.3	8.4	-	-	-
Total %	1.6	13.0	16.8	-	31.5	0.8	13.6	3.8	-	18.2	14.1	8.6	1.0	-	23.7	6.2	18.2	2.2	-	26.6	-
PHF	0.700	0.914	0.855	-	0.911	0.750	0.903	0.781	-	0.958	0.874	0.800	0.675	-	0.835	0.827	0.845	0.853	-	0.866	0.902
Motorcycles	0	0	1	-	1	0	0	0	-	0	1	3	0	-	4	1	3	0	-	4	9
% Motorcycles	0.0	0.0	0.2	-	0.1	0.0	0.0	0.0	-	0.0	0.3	1.3	0.0	-	0.6	0.6	0.6	0.0	-	0.6	0.3
Cars	26	186	239	-	451	15	218	81	-	314	214	136	14	-	364	110	322	33	-	465	1594
% Cars	61.9	54.7	54.6	-	55.0	71.4	61.6	81.0	-	66.1	58.3	60.7	51.9	-	58.9	67.9	68.1	56.9	-	67.1	61.2
Light Goods Vehicles	16	136	190	-	342	4	109	19	-	132	137	77	13	-	227	49	142	25	-	216	917
% Light Goods Vehicles	38.1	40.0	43.4	-	41.7	19.0	30.8	19.0	-	27.8	37.3	34.4	48.1	-	36.7	30.2	30.0	43.1	-	31.2	35.2
Buses	0	0	1	-	1	0	0	0	-	0	0	1	0	-	1	0	2	0	-	2	4
% Buses	0.0	0.0	0.2	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.4	0.0	-	0.2	0.0	0.4	0.0	-	0.3	0.2
Single-Unit Trucks	0	7	2	-	9	1	15	0	-	16	8	4	0	-	12	1	4	0	-	5	42
% Single-Unit Trucks	0.0	2.1	0.5	-	1.1	4.8	4.2	0.0	-	3.4	2.2	1.8	0.0	-	1.9	0.6	0.8	0.0	-	0.7	1.6
Articulated Trucks	0	11	4	-	15	1	12	0	-	13	7	0	0	-	7	1	0	0	-	1	36
% Articulated Trucks	0.0	3.2	0.9	-	1.8	4.8	3.4	0.0	-	2.7	1.9	0.0	0.0	-	1.1	0.6	0.0	0.0	-	0.1	1.4
Bicycles on Road	0	0	1	-	1	0	0	0	-	0	0	3	0	-	3	0	0	0	-	0	4
% Bicycles on Road	0.0	0.0	0.2	-	0.1	0.0	0.0	0.0	-	0.0	0.0	1.3	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	9.1	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	10	-	-	-	-	1	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	90.9	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 19

Location: 47.519454131055, -  
111.281587779522



### Turning Movement Peak Hour Data Plot (4:30 PM)



Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River  
Drive/15th\_(Cascade)  
Site Code:  
Start Date: 08/17/2015  
Page No: 20

Location: 47.519454131055, -  
111.281587779522

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_25th (Cascade)  
Site Code:  
Start Date: 09/21/2015  
Page No: 1

Location: 47.5168588339782, -  
111.264231204987

### Turning Movement Data

Start Time	07-2A-059 Westbound			07-2A-058 Eastbound				07-2A-120 Northbound			Int. Total
	Left	Thru	App. Total	Left	Thru	Right	App. Total	Left	Right	App. Total	
7:00 AM	1	46	47	0	127	51	178	17	13	30	255
7:15 AM	3	82	85	0	121	52	173	21	4	25	283
7:30 AM	7	98	105	0	141	76	217	19	10	29	351
7:45 AM	8	115	123	0	151	76	227	21	13	34	384
Hourly Total	19	341	360	0	540	255	795	78	40	118	1273
8:00 AM	9	84	93	0	84	61	145	24	8	32	270
8:15 AM	5	85	90	0	76	56	132	17	5	22	244
8:30 AM	6	71	77	0	78	52	130	25	10	35	242
8:45 AM	7	56	63	0	85	56	141	21	8	29	233
Hourly Total	27	296	323	0	323	225	548	87	31	118	989
9:00 AM	4	41	45	0	63	32	95	23	3	26	166
9:15 AM	7	68	75	0	74	39	113	18	5	23	211
9:30 AM	7	77	84	0	54	30	84	17	4	21	189
9:45 AM	7	70	77	0	79	42	121	14	4	18	216
Hourly Total	25	256	281	0	270	143	413	72	16	88	782
10:00 AM	7	75	82	0	56	47	103	27	4	31	216
10:15 AM	7	63	70	0	79	41	120	23	5	28	218
10:30 AM	8	66	74	0	71	33	104	21	7	28	206
10:45 AM	3	78	81	0	65	42	107	24	6	30	218
Hourly Total	25	282	307	0	271	163	434	95	22	117	858
11:00 AM	8	81	89	0	76	42	118	18	5	23	230
11:15 AM	10	76	86	0	74	42	116	21	5	26	228
11:30 AM	6	86	92	0	73	48	121	19	2	21	234
11:45 AM	8	90	98	0	82	37	119	27	11	38	255
Hourly Total	32	333	365	0	305	169	474	85	23	108	947
12:00 PM	16	80	96	0	94	41	135	22	12	34	265
12:15 PM	5	69	74	0	78	61	139	31	8	39	252
12:30 PM	8	65	73	0	113	51	164	25	14	39	276
12:45 PM	5	84	89	0	97	73	170	24	22	46	305
Hourly Total	34	298	332	0	382	226	608	102	56	158	1098
1:00 PM	6	88	94	0	86	45	131	23	12	35	260
1:15 PM	10	63	73	0	94	57	151	27	4	31	255
1:30 PM	10	77	87	0	98	52	150	32	7	39	276
1:45 PM	6	80	86	0	108	38	146	25	5	30	262
Hourly Total	32	308	340	0	386	192	578	107	28	135	1053
2:00 PM	7	84	91	0	90	45	135	19	11	30	256
2:15 PM	9	67	76	0	95	47	142	18	5	23	241
2:30 PM	12	129	141	0	101	44	145	28	8	36	322
2:45 PM	10	109	119	0	99	41	140	23	1	24	283
Hourly Total	38	389	427	0	385	177	562	88	25	113	1102
3:00 PM	11	115	126	0	109	55	164	38	6	44	334

3:15 PM	12	83	95	0	83	61	144	27	7	34	273
3:30 PM	14	123	137	0	114	64	178	29	14	43	358
3:45 PM	9	93	102	0	91	76	167	38	6	44	313
Hourly Total	46	414	460	0	397	256	653	132	33	165	1278
4:00 PM	8	137	145	0	94	55	149	34	8	42	336
4:15 PM	12	141	153	0	108	56	164	24	9	33	350
4:30 PM	18	162	180	0	102	46	148	24	7	31	359
4:45 PM	11	162	173	0	106	55	161	29	7	36	370
Hourly Total	49	602	651	0	410	212	622	111	31	142	1415
5:00 PM	16	188	204	0	152	71	223	31	12	43	470
5:15 PM	9	137	146	0	127	84	211	31	5	36	393
5:30 PM	9	138	147	0	111	58	169	35	5	40	356
5:45 PM	8	116	124	0	95	70	165	26	7	33	322
Hourly Total	42	579	621	0	485	283	768	123	29	152	1541
6:00 PM	10	78	88	0	98	53	151	30	3	33	272
6:15 PM	3	78	81	0	68	45	113	18	7	25	219
6:30 PM	3	64	67	0	114	50	164	17	4	21	252
6:45 PM	2	69	71	0	66	32	98	30	6	36	205
Hourly Total	18	289	307	0	346	180	526	95	20	115	948
7:00 PM	6	70	76	0	56	22	78	25	1	26	180
7:15 PM	2	64	66	0	49	34	83	20	0	20	169
7:30 PM	2	43	45	0	54	20	74	22	2	24	143
7:45 PM	6	51	57	0	51	31	82	22	1	23	162
Hourly Total	16	228	244	0	210	107	317	89	4	93	654
8:00 PM	3	38	41	0	30	23	53	17	1	18	112
8:15 PM	0	32	32	0	46	22	68	11	0	11	111
8:30 PM	0	21	21	0	27	13	40	7	1	8	69
8:45 PM	2	30	32	0	36	17	53	7	1	8	93
Hourly Total	5	121	126	0	139	75	214	42	3	45	385
9:00 PM	3	49	52	0	30	14	44	9	1	10	106
9:15 PM	4	27	31	0	19	13	32	4	0	4	67
9:30 PM	0	19	19	0	27	16	43	4	0	4	66
9:45 PM	1	11	12	0	16	8	24	5	0	5	41
Hourly Total	8	106	114	0	92	51	143	22	1	23	280
10:00 PM	2	19	21	0	24	7	31	4	1	5	57
10:15 PM	1	10	11	0	15	4	19	5	0	5	35
10:30 PM	2	11	13	0	11	6	17	5	0	5	35
10:45 PM	0	6	6	0	9	6	15	4	0	4	25
Hourly Total	5	46	51	0	59	23	82	18	1	19	152
11:00 PM	1	13	14	0	3	8	11	8	0	8	33
11:15 PM	0	6	6	0	13	6	19	1	0	1	26
11:30 PM	3	7	10	0	5	3	8	5	0	5	23
11:45 PM	0	4	4	0	9	4	13	3	1	4	21
Hourly Total	4	30	34	0	30	21	51	17	1	18	103
12:00 AM	0	6	6	0	5	2	7	2	0	2	15
12:15 AM	0	5	5	0	3	4	7	2	1	3	15
12:30 AM	0	2	2	0	2	4	6	1	0	1	9
12:45 AM	0	4	4	0	4	0	4	2	0	2	10
Hourly Total	0	17	17	0	14	10	24	7	1	8	49
1:00 AM	1	2	3	0	4	2	6	0	0	0	9
1:15 AM	1	0	1	0	2	2	4	0	0	0	5
1:30 AM	0	3	3	0	3	2	5	2	0	2	10

1:45 AM	0	2	2	0	3	4	7	0	0	0	9
Hourly Total	2	7	9	0	12	10	22	2	0	2	33
2:00 AM	2	0	2	0	5	5	10	0	0	0	12
2:15 AM	0	1	1	0	0	1	1	1	0	1	3
2:30 AM	0	2	2	0	2	3	5	0	1	1	8
2:45 AM	0	4	4	0	2	2	4	0	0	0	8
Hourly Total	2	7	9	0	9	11	20	1	1	2	31
3:00 AM	0	3	3	0	1	1	2	0	0	0	5
3:15 AM	0	1	1	0	2	1	3	1	0	1	5
3:30 AM	0	1	1	0	8	2	10	2	0	2	13
3:45 AM	0	2	2	0	7	1	8	4	0	4	14
Hourly Total	0	7	7	0	18	5	23	7	0	7	37
4:00 AM	0	4	4	0	6	2	8	2	0	2	14
4:15 AM	1	4	5	0	11	1	12	0	0	0	17
4:30 AM	0	7	7	0	17	3	20	6	1	7	34
4:45 AM	0	5	5	0	19	5	24	1	0	1	30
Hourly Total	1	20	21	0	53	11	64	9	1	10	95
5:00 AM	0	8	8	0	18	5	23	7	1	8	39
5:15 AM	1	14	15	0	23	6	29	3	1	4	48
5:30 AM	0	32	32	0	61	7	68	10	2	12	112
5:45 AM	1	41	42	0	69	21	90	8	0	8	140
Hourly Total	2	95	97	0	171	39	210	28	4	32	339
6:00 AM	2	30	32	0	38	12	50	5	4	9	91
6:15 AM	0	39	39	0	74	24	98	14	3	17	154
6:30 AM	0	59	59	0	109	38	147	10	7	17	223
6:45 AM	3	61	64	0	117	46	163	20	11	31	258
Hourly Total	5	189	194	0	338	120	458	49	25	74	726
7:00 AM	1	66	67	0	121	42	163	9	15	24	254
7:15 AM	3	85	88	0	107	64	171	17	6	23	282
7:30 AM	1	120	121	0	143	73	216	21	6	27	364
7:45 AM	8	93	101	0	138	105	243	23	18	41	385
Hourly Total	13	364	377	0	509	284	793	70	45	115	1285
8:00 AM	8	65	73	0	86	53	139	20	6	26	238
8:15 AM	4	78	82	0	86	61	147	22	8	30	259
8:30 AM	5	78	83	0	84	51	135	17	7	24	242
8:45 AM	3	76	79	0	94	44	138	21	5	26	243
Hourly Total	20	297	317	0	350	209	559	80	26	106	982
9:00 AM	4	61	65	0	78	35	113	24	5	29	207
9:15 AM	3	42	45	0	60	38	98	15	6	21	164
9:30 AM	8	63	71	0	65	57	122	24	3	27	220
9:45 AM	6	72	78	0	77	35	112	18	4	22	212
Hourly Total	21	238	259	0	280	165	445	81	18	99	803
10:00 AM	9	57	66	0	58	49	107	15	6	21	194
10:15 AM	0	65	65	0	70	32	102	21	6	27	194
10:30 AM	6	62	68	0	72	42	114	16	6	22	204
10:45 AM	5	82	87	0	63	49	112	22	7	29	228
Hourly Total	20	266	286	0	263	172	435	74	25	99	820
11:00 AM	8	76	84	0	83	42	125	16	6	22	231
11:15 AM	4	91	95	0	59	52	111	32	12	44	250
11:30 AM	11	75	86	0	76	41	117	19	8	27	230
11:45 AM	9	88	97	0	78	42	120	19	5	24	241
Hourly Total	32	330	362	0	296	177	473	86	31	117	952

12:00 PM	23	107	130	0	96	46	142	25	10	35	307
12:15 PM	6	70	76	0	104	44	148	24	7	31	255
12:30 PM	8	80	88	0	106	60	166	24	6	30	284
12:45 PM	10	71	81	0	105	55	160	27	16	43	284
Hourly Total	47	328	375	0	411	205	616	100	39	139	1130
1:00 PM	12	83	95	0	90	57	147	19	8	27	269
1:15 PM	9	71	80	0	89	37	126	24	10	34	240
1:30 PM	8	89	97	0	84	57	141	31	7	38	276
1:45 PM	6	89	95	0	86	58	144	25	3	28	267
Hourly Total	35	332	367	0	349	209	558	99	28	127	1052
2:00 PM	7	75	82	1	71	35	107	18	4	22	211
2:15 PM	9	87	96	0	101	53	154	16	6	22	272
2:30 PM	14	120	134	0	93	39	132	26	5	31	297
2:45 PM	8	91	99	0	89	56	145	29	7	36	280
Hourly Total	38	373	411	1	354	183	538	89	22	111	1060
3:00 PM	7	82	89	0	96	63	159	19	7	26	274
3:15 PM	9	79	88	0	101	50	151	32	3	35	274
3:30 PM	13	121	134	0	117	73	190	28	5	33	357
3:45 PM	13	126	139	0	93	69	162	30	0	30	331
Hourly Total	42	408	450	0	407	255	662	109	15	124	1236
4:00 PM	5	151	156	0	125	62	187	28	4	32	375
4:15 PM	5	105	110	0	101	64	165	30	2	32	307
4:30 PM	9	182	191	0	111	56	167	25	9	34	392
4:45 PM	14	155	169	0	133	68	201	27	7	34	404
Hourly Total	33	593	626	0	470	250	720	110	22	132	1478
5:00 PM	26	168	194	0	158	76	234	28	8	36	464
5:15 PM	7	143	150	0	113	67	180	21	4	25	355
5:30 PM	7	155	162	0	113	63	176	36	5	41	379
5:45 PM	9	115	124	0	104	46	150	30	6	36	310
Hourly Total	49	581	630	0	488	252	740	115	23	138	1508
6:00 PM	7	120	127	0	76	56	132	28	6	34	293
6:15 PM	12	82	94	0	90	58	148	27	3	30	272
6:30 PM	5	76	81	0	83	28	111	21	5	26	218
6:45 PM	4	54	58	0	55	47	102	18	5	23	183
Hourly Total	28	332	360	0	304	189	493	94	19	113	966
7:00 PM	3	50	53	0	56	36	92	22	7	29	174
7:15 PM	6	71	77	0	60	35	95	28	6	34	206
7:30 PM	7	51	58	0	54	20	74	18	0	18	150
7:45 PM	4	53	57	0	50	31	81	14	4	18	156
Hourly Total	20	225	245	0	220	122	342	82	17	99	686
8:00 PM	3	51	54	0	45	29	74	14	2	16	144
8:15 PM	1	22	23	0	49	29	78	17	2	19	120
8:30 PM	1	33	34	0	46	22	68	8	1	9	111
8:45 PM	2	30	32	1	28	19	48	11	0	11	91
Hourly Total	7	136	143	1	168	99	268	50	5	55	466
9:00 PM	3	25	28	0	31	18	49	18	4	22	99
9:15 PM	2	13	15	0	27	15	42	10	1	11	68
9:30 PM	4	23	27	0	16	11	27	6	0	6	60
9:45 PM	0	11	11	0	19	4	23	6	0	6	40
Hourly Total	9	72	81	0	93	48	141	40	5	45	267
10:00 PM	2	19	21	0	14	9	23	1	0	1	45
10:15 PM	1	24	25	0	10	10	20	1	0	1	46



10:30 PM	1	15	16	0	17	11	28	5	0	5	49
10:45 PM	1	7	8	0	11	11	22	5	0	5	35
Hourly Total	5	65	70	0	52	41	93	12	0	12	175
11:00 PM	2	6	8	0	6	5	11	5	0	5	24
11:15 PM	0	4	4	0	5	3	8	3	0	3	15
11:30 PM	0	3	3	0	5	3	8	3	0	3	14
11:45 PM	0	3	3	0	4	1	5	1	0	1	9
Hourly Total	2	16	18	0	20	12	32	12	0	12	62
12:00 AM	0	8	8	0	4	3	7	3	0	3	18
12:15 AM	0	3	3	0	5	5	10	3	0	3	16
12:30 AM	0	4	4	0	3	1	4	1	1	2	10
12:45 AM	0	1	1	0	4	1	5	2	0	2	8
Hourly Total	0	16	16	0	16	10	26	9	1	10	52
1:00 AM	0	2	2	0	4	5	9	2	0	2	13
1:15 AM	0	4	4	0	2	2	4	0	0	0	8
1:30 AM	0	3	3	0	3	1	4	0	0	0	7
1:45 AM	0	4	4	0	7	1	8	1	0	1	13
Hourly Total	0	13	13	0	16	9	25	3	0	3	41
2:00 AM	0	3	3	0	4	2	6	0	0	0	9
2:15 AM	0	4	4	0	1	0	1	1	0	1	6
2:30 AM	0	0	0	0	1	1	2	1	0	1	3
2:45 AM	0	1	1	0	1	0	1	0	0	0	2
Hourly Total	0	8	8	0	7	3	10	2	0	2	20
3:00 AM	0	1	1	0	5	5	10	0	0	0	11
3:15 AM	1	1	2	0	3	2	5	0	0	0	7
3:30 AM	0	1	1	0	4	1	5	2	0	2	8
3:45 AM	0	6	6	0	10	1	11	2	1	3	20
Hourly Total	1	9	10	0	22	9	31	4	1	5	46
4:00 AM	0	1	1	0	8	2	10	1	0	1	12
4:15 AM	0	6	6	0	8	1	9	0	0	0	15
4:30 AM	0	2	2	0	10	1	11	4	1	5	18
4:45 AM	1	11	12	0	18	5	23	5	1	6	41
Hourly Total	1	20	21	0	44	9	53	10	2	12	86
5:00 AM	0	12	12	0	15	4	19	2	1	3	34
5:15 AM	0	7	7	0	29	6	35	8	1	9	51
5:30 AM	1	27	28	0	56	9	65	9	3	12	105
5:45 AM	2	43	45	0	72	29	101	12	1	13	159
Hourly Total	3	89	92	0	172	48	220	31	6	37	349
6:00 AM	0	42	42	0	55	19	74	12	3	15	131
6:15 AM	0	42	42	0	77	29	106	9	0	9	157
6:30 AM	0	54	54	0	103	41	144	17	9	26	224
6:45 AM	0	65	65	0	125	45	170	20	12	32	267
Hourly Total	0	203	203	0	360	134	494	58	24	82	779
Grand Total	863	10574	11437	2	11316	6058	17376	2886	770	3656	32469
Approach %	7.5	92.5	-	0.0	65.1	34.9	-	78.9	21.1	-	-
Total %	2.7	32.6	35.2	0.0	34.9	18.7	53.5	8.9	2.4	11.3	-
Motorcycles	2	96	98	0	96	22	118	15	5	20	236
% Motorcycles	0.2	0.9	0.9	0.0	0.8	0.4	0.7	0.5	0.6	0.5	0.7
Cars	442	5792	6234	1	6633	4615	11249	1870	503	2373	19856
% Cars	51.2	54.8	54.5	50.0	58.6	76.2	64.7	64.8	65.3	64.9	61.2
Light Goods Vehicles	306	3837	4143	1	3687	1150	4838	792	174	966	9947
% Light Goods Vehicles	35.5	36.3	36.2	50.0	32.6	19.0	27.8	27.4	22.6	26.4	30.6

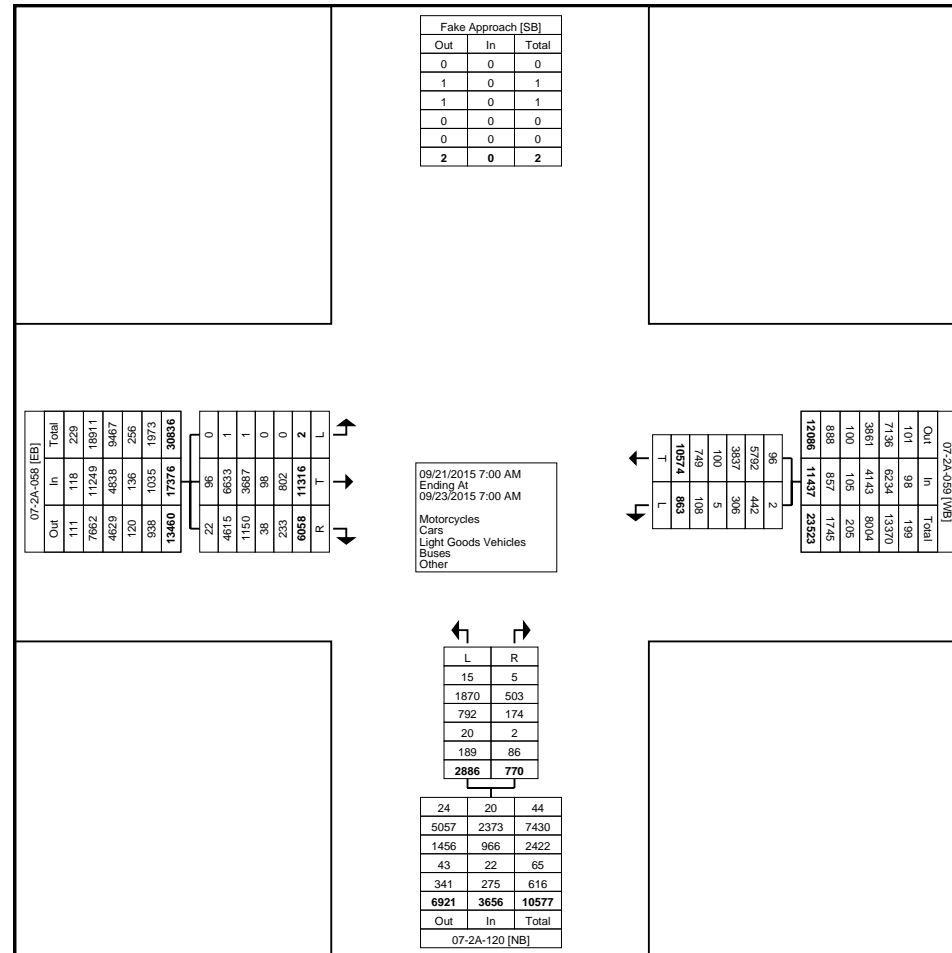
[illegible]

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_25th (Cascade)  
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Turning Movement Data Plot

Montana Department of Transportation  
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Count Name: Great Falls\_River\_25th (Cascade)  
Site Code:  
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Location: 47.5168588339782, -  
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### Turning Movement Peak Hour Data (7:15 AM)

Start Time	07-2A-059 Westbound			07-2A-058 Eastbound				07-2A-120 Northbound			Int. Total
	Left	Thru	App. Total	Left	Thru	Right	App. Total	Left	Right	App. Total	
7:15 AM	3	82	85	0	121	52	173	21	4	25	283
7:30 AM	7	98	105	0	141	76	217	19	10	29	351
7:45 AM	8	115	123	0	151	76	227	21	13	34	384
8:00 AM	9	84	93	0	84	61	145	24	8	32	270
Total	27	379	406	0	497	265	762	85	35	120	1288
Approach %	6.7	93.3	-	0.0	65.2	34.8	-	70.8	29.2	-	-
Total %	2.1	29.4	31.5	0.0	38.6	20.6	59.2	6.6	2.7	9.3	-
PHF	0.750	0.824	0.825	0.000	0.823	0.872	0.839	0.885	0.673	0.882	0.839
Motorcycles	0	1	1	0	2	0	2	0	0	0	3
% Motorcycles	0.0	0.3	0.2	-	0.4	0.0	0.3	0.0	0.0	0.0	0.2
Cars	8	196	204	0	279	211	490	58	24	82	776
% Cars	29.6	51.7	50.2	-	56.1	79.6	64.3	68.2	68.6	68.3	60.2
Light Goods Vehicles	16	145	161	0	172	41	213	19	7	26	400
% Light Goods Vehicles	59.3	38.3	39.7	-	34.6	15.5	28.0	22.4	20.0	21.7	31.1
Buses	0	6	6	0	4	5	9	2	0	2	17
% Buses	0.0	1.6	1.5	-	0.8	1.9	1.2	2.4	0.0	1.7	1.3
Single-Unit Trucks	3	21	24	0	26	4	30	1	3	4	58
% Single-Unit Trucks	11.1	5.5	5.9	-	5.2	1.5	3.9	1.2	8.6	3.3	4.5
Articulated Trucks	0	10	10	0	14	4	18	5	1	6	34
% Articulated Trucks	0.0	2.6	2.5	-	2.8	1.5	2.4	5.9	2.9	5.0	2.6
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0





Montana Department of Transportation  
2701 Prospect

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Location: 47.5168588339782, -  
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### Turning Movement Peak Hour Data (12:00 PM)

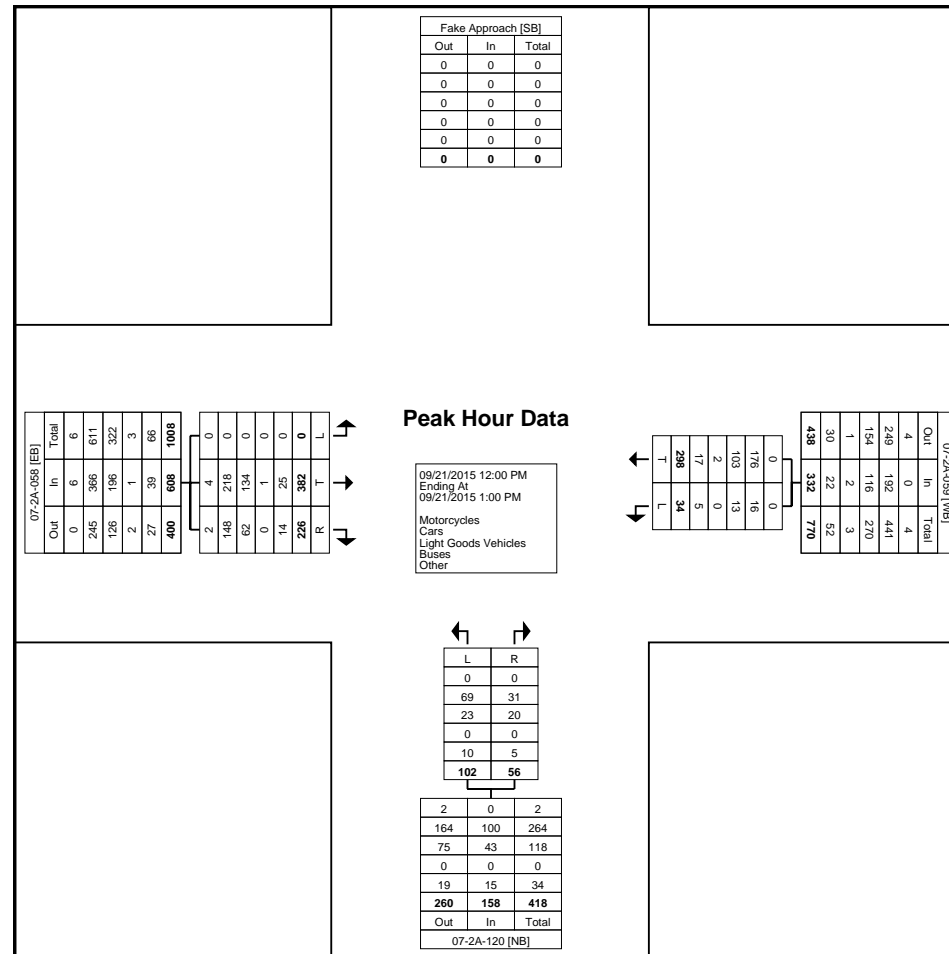
Start Time	07-2A-059 Westbound			07-2A-058 Eastbound				07-2A-120 Northbound			Int. Total
	Left	Thru	App. Total	Left	Thru	Right	App. Total	Left	Right	App. Total	
12:00 PM	16	80	96	0	94	41	135	22	12	34	265
12:15 PM	5	69	74	0	78	61	139	31	8	39	252
12:30 PM	8	65	73	0	113	51	164	25	14	39	276
12:45 PM	5	84	89	0	97	73	170	24	22	46	305
Total	34	298	332	0	382	226	608	102	56	158	1098
Approach %	10.2	89.8	-	0.0	62.8	37.2	-	64.6	35.4	-	-
Total %	3.1	27.1	30.2	0.0	34.8	20.6	55.4	9.3	5.1	14.4	-
PHF	0.531	0.887	0.865	0.000	0.845	0.774	0.894	0.823	0.636	0.859	0.900
Motorcycles	0	0	0	0	4	2	6	0	0	0	6
% Motorcycles	0.0	0.0	0.0	-	1.0	0.9	1.0	0.0	0.0	0.0	0.5
Cars	16	176	192	0	218	148	366	69	31	100	658
% Cars	47.1	59.1	57.8	-	57.1	65.5	60.2	67.6	55.4	63.3	59.9
Light Goods Vehicles	13	103	116	0	134	62	196	23	20	43	355
% Light Goods Vehicles	38.2	34.6	34.9	-	35.1	27.4	32.2	22.5	35.7	27.2	32.3
Buses	0	2	2	0	1	0	1	0	0	0	3
% Buses	0.0	0.7	0.6	-	0.3	0.0	0.2	0.0	0.0	0.0	0.3
Single-Unit Trucks	5	11	16	0	14	4	18	4	2	6	40
% Single-Unit Trucks	14.7	3.7	4.8	-	3.7	1.8	3.0	3.9	3.6	3.8	3.6
Articulated Trucks	0	6	6	0	11	10	21	6	3	9	36
% Articulated Trucks	0.0	2.0	1.8	-	2.9	4.4	3.5	5.9	5.4	5.7	3.3
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Location: 47.5168588339782, -  
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### Turning Movement Peak Hour Data (4:30 PM)

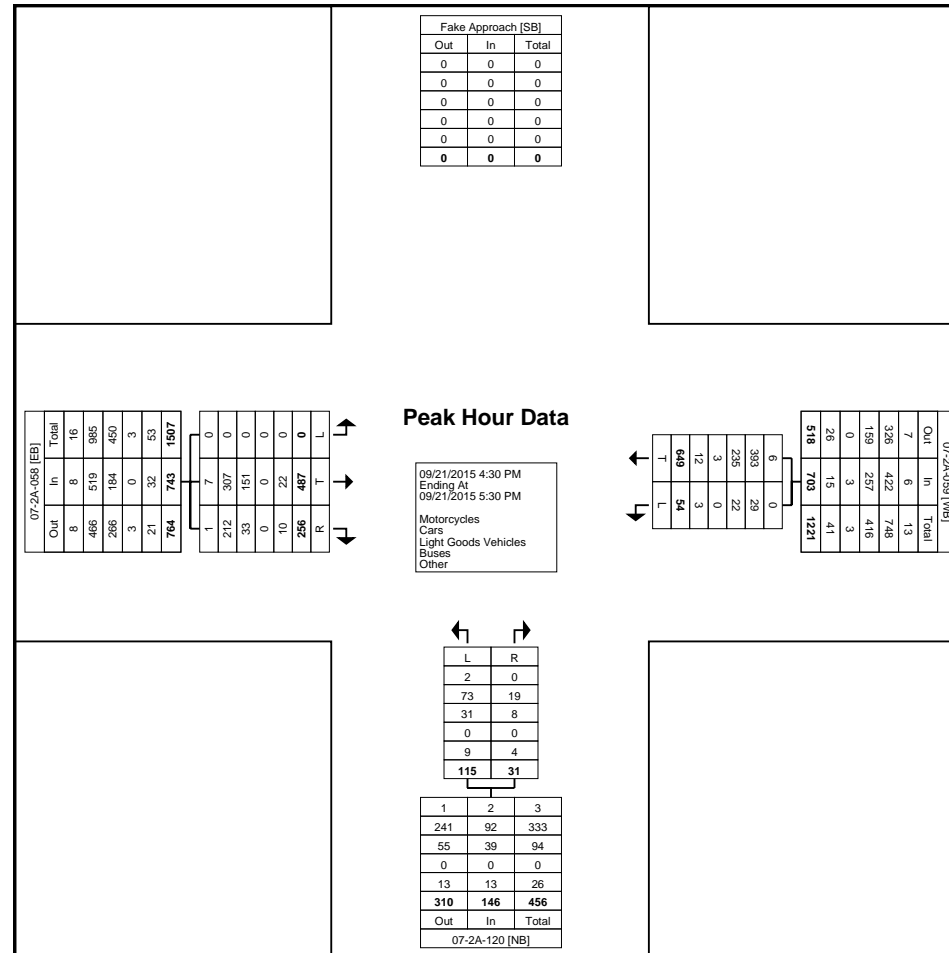
Start Time	07-2A-059 Westbound			07-2A-058 Eastbound				07-2A-120 Northbound			Int. Total
	Left	Thru	App. Total	Left	Thru	Right	App. Total	Left	Right	App. Total	
4:30 PM	18	162	180	0	102	46	148	24	7	31	359
4:45 PM	11	162	173	0	106	55	161	29	7	36	370
5:00 PM	16	188	204	0	152	71	223	31	12	43	470
5:15 PM	9	137	146	0	127	84	211	31	5	36	393
Total	54	649	703	0	487	256	743	115	31	146	1592
Approach %	7.7	92.3	-	0.0	65.5	34.5	-	78.8	21.2	-	-
Total %	3.4	40.8	44.2	0.0	30.6	16.1	46.7	7.2	1.9	9.2	-
PHF	0.750	0.863	0.862	0.000	0.801	0.762	0.833	0.927	0.646	0.849	0.847
Motorcycles	0	6	6	0	7	1	8	2	0	2	16
% Motorcycles	0.0	0.9	0.9	-	1.4	0.4	1.1	1.7	0.0	1.4	1.0
Cars	29	393	422	0	307	212	519	73	19	92	1033
% Cars	53.7	60.6	60.0	-	63.0	82.8	69.9	63.5	61.3	63.0	64.9
Light Goods Vehicles	22	235	257	0	151	33	184	31	8	39	480
% Light Goods Vehicles	40.7	36.2	36.6	-	31.0	12.9	24.8	27.0	25.8	26.7	30.2
Buses	0	3	3	0	0	0	0	0	0	0	3
% Buses	0.0	0.5	0.4	-	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Single-Unit Trucks	2	9	11	0	15	1	16	2	2	4	31
% Single-Unit Trucks	3.7	1.4	1.6	-	3.1	0.4	2.2	1.7	6.5	2.7	1.9
Articulated Trucks	1	3	4	0	7	9	16	7	2	9	29
% Articulated Trucks	1.9	0.5	0.6	-	1.4	3.5	2.2	6.1	6.5	6.2	1.8
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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### Turning Movement Peak Hour Data (7:00 AM)

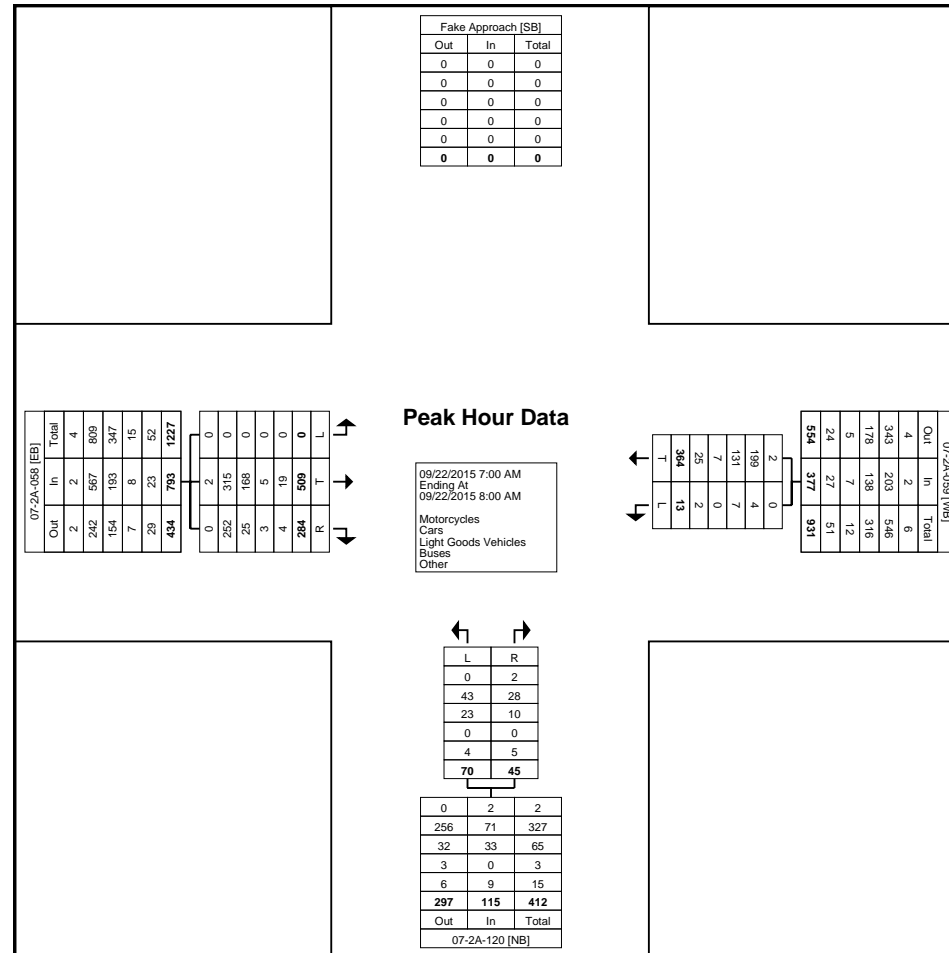
Start Time	07-2A-059 Westbound			07-2A-058 Eastbound				07-2A-120 Northbound			Int. Total
	Left	Thru	App. Total	Left	Thru	Right	App. Total	Left	Right	App. Total	
7:00 AM	1	66	67	0	121	42	163	9	15	24	254
7:15 AM	3	85	88	0	107	64	171	17	6	23	282
7:30 AM	1	120	121	0	143	73	216	21	6	27	364
7:45 AM	8	93	101	0	138	105	243	23	18	41	385
Total	13	364	377	0	509	284	793	70	45	115	1285
Approach %	3.4	96.6	-	0.0	64.2	35.8	-	60.9	39.1	-	-
Total %	1.0	28.3	29.3	0.0	39.6	22.1	61.7	5.4	3.5	8.9	-
PHF	0.406	0.758	0.779	0.000	0.890	0.676	0.816	0.761	0.625	0.701	0.834
Motorcycles	0	2	2	0	2	0	2	0	2	2	6
% Motorcycles	0.0	0.5	0.5	-	0.4	0.0	0.3	0.0	4.4	1.7	0.5
Cars	4	199	203	0	315	252	567	43	28	71	841
% Cars	30.8	54.7	53.8	-	61.9	88.7	71.5	61.4	62.2	61.7	65.4
Light Goods Vehicles	7	131	138	0	168	25	193	23	10	33	364
% Light Goods Vehicles	53.8	36.0	36.6	-	33.0	8.8	24.3	32.9	22.2	28.7	28.3
Buses	0	7	7	0	5	3	8	0	0	0	15
% Buses	0.0	1.9	1.9	-	1.0	1.1	1.0	0.0	0.0	0.0	1.2
Single-Unit Trucks	2	17	19	0	11	1	12	0	5	5	36
% Single-Unit Trucks	15.4	4.7	5.0	-	2.2	0.4	1.5	0.0	11.1	4.3	2.8
Articulated Trucks	0	8	8	0	8	3	11	4	0	4	23
% Articulated Trucks	0.0	2.2	2.1	-	1.6	1.1	1.4	5.7	0.0	3.5	1.8
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Montana Department of Transportation  
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### Turning Movement Peak Hour Data (12:00 PM)

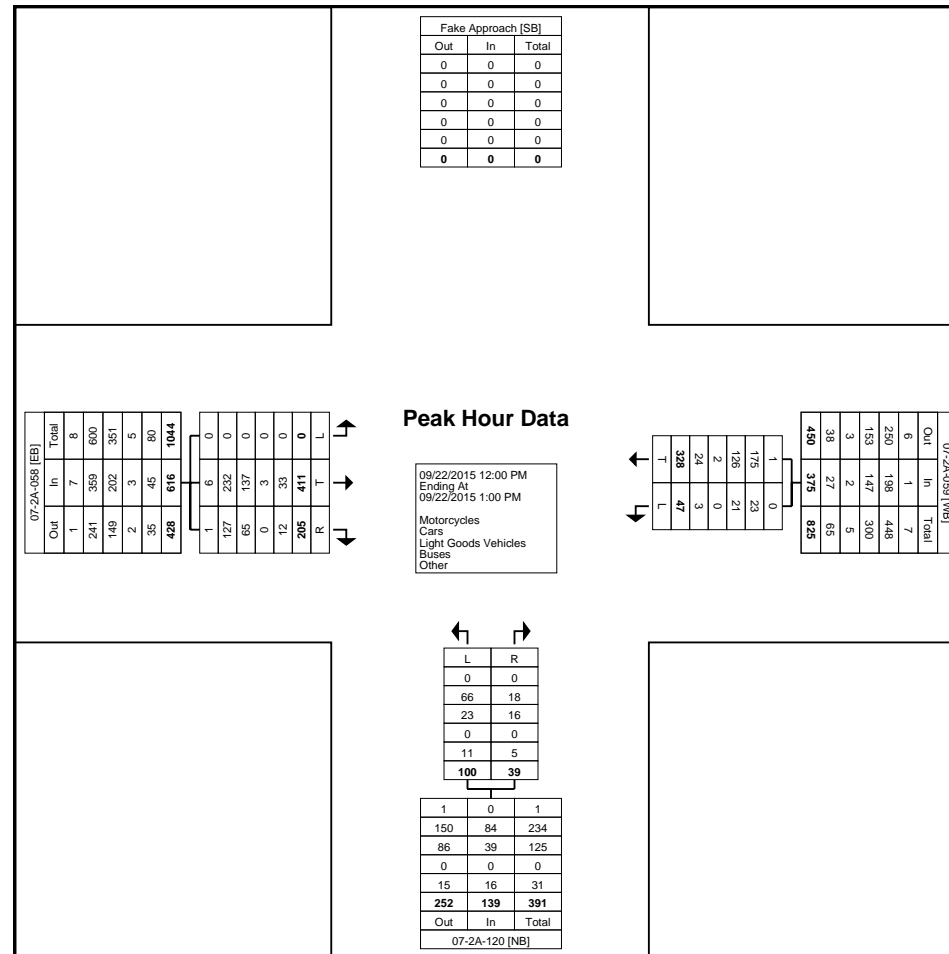
Start Time	07-2A-059 Westbound			07-2A-058 Eastbound				07-2A-120 Northbound			Int. Total
	Left	Thru	App. Total	Left	Thru	Right	App. Total	Left	Right	App. Total	
12:00 PM	23	107	130	0	96	46	142	25	10	35	307
12:15 PM	6	70	76	0	104	44	148	24	7	31	255
12:30 PM	8	80	88	0	106	60	166	24	6	30	284
12:45 PM	10	71	81	0	105	55	160	27	16	43	284
Total	47	328	375	0	411	205	616	100	39	139	1130
Approach %	12.5	87.5	-	0.0	66.7	33.3	-	71.9	28.1	-	-
Total %	4.2	29.0	33.2	0.0	36.4	18.1	54.5	8.8	3.5	12.3	-
PHF	0.511	0.766	0.721	0.000	0.969	0.854	0.928	0.926	0.609	0.808	0.920
Motorcycles	0	1	1	0	6	1	7	0	0	0	8
% Motorcycles	0.0	0.3	0.3	-	1.5	0.5	1.1	0.0	0.0	0.0	0.7
Cars	23	175	198	0	232	127	359	66	18	84	641
% Cars	48.9	53.4	52.8	-	56.4	62.0	58.3	66.0	46.2	60.4	56.7
Light Goods Vehicles	21	126	147	0	137	65	202	23	16	39	388
% Light Goods Vehicles	44.7	38.4	39.2	-	33.3	31.7	32.8	23.0	41.0	28.1	34.3
Buses	0	2	2	0	3	0	3	0	0	0	5
% Buses	0.0	0.6	0.5	-	0.7	0.0	0.5	0.0	0.0	0.0	0.4
Single-Unit Trucks	1	13	14	0	21	7	28	1	1	2	44
% Single-Unit Trucks	2.1	4.0	3.7	-	5.1	3.4	4.5	1.0	2.6	1.4	3.9
Articulated Trucks	2	11	13	0	12	5	17	10	4	14	44
% Articulated Trucks	4.3	3.4	3.5	-	2.9	2.4	2.8	10.0	10.3	10.1	3.9
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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### Turning Movement Peak Hour Data (4:30 PM)

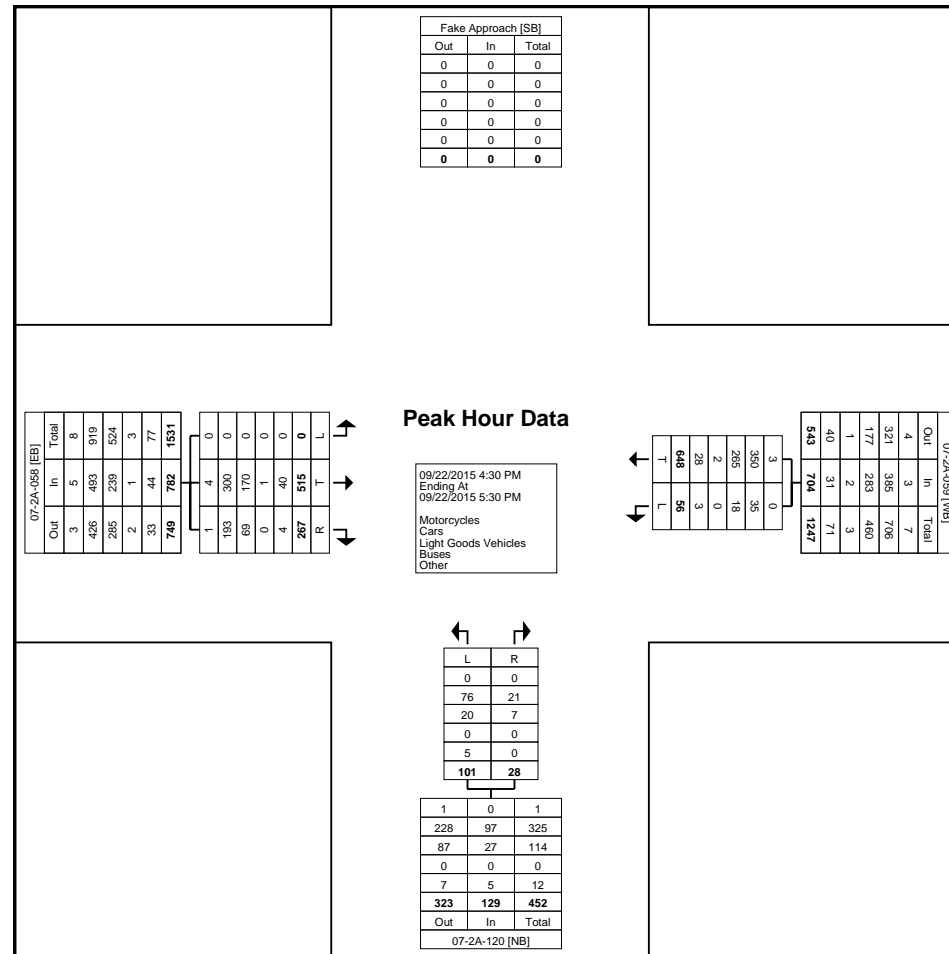
Start Time	07-2A-059 Westbound			07-2A-058 Eastbound				07-2A-120 Northbound			Int. Total
	Left	Thru	App. Total	Left	Thru	Right	App. Total	Left	Right	App. Total	
4:30 PM	9	182	191	0	111	56	167	25	9	34	392
4:45 PM	14	155	169	0	133	68	201	27	7	34	404
5:00 PM	26	168	194	0	158	76	234	28	8	36	464
5:15 PM	7	143	150	0	113	67	180	21	4	25	355
Total	56	648	704	0	515	267	782	101	28	129	1615
Approach %	8.0	92.0	-	0.0	65.9	34.1	-	78.3	21.7	-	-
Total %	3.5	40.1	43.6	0.0	31.9	16.5	48.4	6.3	1.7	8.0	-
PHF	0.538	0.890	0.907	0.000	0.815	0.878	0.835	0.902	0.778	0.896	0.870
Motorcycles	0	3	3	0	4	1	5	0	0	0	8
% Motorcycles	0.0	0.5	0.4	-	0.8	0.4	0.6	0.0	0.0	0.0	0.5
Cars	35	350	385	0	300	193	493	76	21	97	975
% Cars	62.5	54.0	54.7	-	58.3	72.3	63.0	75.2	75.0	75.2	60.4
Light Goods Vehicles	18	265	283	0	170	69	239	20	7	27	549
% Light Goods Vehicles	32.1	40.9	40.2	-	33.0	25.8	30.6	19.8	25.0	20.9	34.0
Buses	0	2	2	0	1	0	1	0	0	0	3
% Buses	0.0	0.3	0.3	-	0.2	0.0	0.1	0.0	0.0	0.0	0.2
Single-Unit Trucks	1	18	19	0	28	1	29	0	0	0	48
% Single-Unit Trucks	1.8	2.8	2.7	-	5.4	0.4	3.7	0.0	0.0	0.0	3.0
Articulated Trucks	2	10	12	0	12	3	15	5	0	5	32
% Articulated Trucks	3.6	1.5	1.7	-	2.3	1.1	1.9	5.0	0.0	3.9	2.0
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_25th (Cascade)  
Site Code:  
Start Date: 09/21/2015  
Page No: 19

Location: 47.5168588339782, -  
111.264231204987



Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_25th (Cascade)  
Site Code:  
Start Date: 09/21/2015  
Page No: 20

Location: 47.5168588339782, -  
111.264231204987

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_38th (Cascade)  
Site Code:  
Start Date: 09/21/2015  
Page No: 1

Location: 47.5210780102162, -  
111.241358667612

## Turning Movement Data

Start Time	07-2A-061 Westbound				07-2A-060 Eastbound				Unnamed Southbound				07-2A-124 Northbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
6:30 AM	1	28	0	29	0	66	8	74	0	0	0	0	29	0	9	38	141
6:45 AM	1	35	0	36	0	107	22	129	0	0	0	0	34	0	12	46	211
Hourly Total	2	63	0	65	0	173	30	203	0	0	0	0	63	0	21	84	352
7:00 AM	0	20	0	20	0	102	23	125	0	0	0	0	25	0	5	30	175
7:15 AM	0	50	0	50	0	100	35	135	0	0	0	0	30	0	6	36	221
7:30 AM	3	49	0	52	0	99	36	135	0	0	0	0	54	0	7	61	248
7:45 AM	2	66	0	68	0	126	42	168	0	0	0	0	54	0	11	65	301
Hourly Total	5	185	0	190	0	427	136	563	0	0	0	0	163	0	29	192	945
8:00 AM	3	43	0	46	2	82	28	112	0	0	0	0	48	1	2	51	209
8:15 AM	1	51	0	52	0	49	23	72	0	0	0	0	36	0	6	42	166
8:30 AM	4	39	0	43	0	45	24	69	0	0	0	0	37	0	9	46	158
8:45 AM	4	41	0	45	0	58	37	95	0	1	1	2	27	1	1	29	171
Hourly Total	12	174	0	186	2	234	112	348	0	1	1	2	148	2	18	168	704
9:00 AM	3	26	0	29	1	40	23	64	0	0	1	1	16	0	7	23	117
9:15 AM	3	44	0	47	0	50	24	74	0	0	0	0	22	1	7	30	151
9:30 AM	3	57	0	60	0	48	15	63	0	1	0	1	24	0	6	30	154
9:45 AM	3	53	0	56	1	43	15	59	0	0	0	0	23	0	7	30	145
Hourly Total	12	180	0	192	2	181	77	260	0	1	1	2	85	1	27	113	567
10:00 AM	5	54	0	59	0	46	23	69	0	0	0	0	27	0	7	34	162
10:15 AM	3	48	0	51	0	39	31	70	0	0	0	0	20	0	5	25	146
10:30 AM	5	49	0	54	1	50	28	79	1	0	0	1	16	1	13	30	164
10:45 AM	5	53	0	58	0	46	20	66	0	1	0	1	29	0	8	37	162
Hourly Total	18	204	0	222	1	181	102	284	1	1	0	2	92	1	33	126	634
11:00 AM	4	51	2	57	0	46	20	66	1	0	1	2	30	0	6	36	161
11:15 AM	5	63	0	68	0	49	34	83	0	0	0	0	17	0	4	21	172
11:30 AM	5	62	0	67	0	39	22	61	0	1	0	1	17	0	4	21	150
11:45 AM	6	62	0	68	0	46	36	82	0	0	2	2	26	1	8	35	187
Hourly Total	20	238	2	260	0	180	112	292	1	1	3	5	90	1	22	113	670
12:00 PM	11	65	0	76	0	56	28	84	0	0	0	0	24	0	3	27	187
12:15 PM	6	42	0	48	0	62	35	97	0	0	0	0	25	0	7	32	177
12:30 PM	5	45	0	50	0	67	29	96	0	0	1	1	25	1	6	32	179
12:45 PM	6	56	0	62	1	82	26	109	0	0	0	0	31	0	11	42	213
Hourly Total	28	208	0	236	1	267	118	386	0	0	1	1	105	1	27	133	756
1:00 PM	6	52	0	58	0	60	34	94	0	1	0	1	26	0	13	39	192
1:15 PM	5	52	1	58	0	63	30	93	0	0	1	1	16	0	7	23	175
1:30 PM	5	54	0	59	1	62	28	91	0	1	0	1	24	0	11	35	186
1:45 PM	8	56	0	64	0	65	40	105	0	0	0	0	29	0	8	37	206
Hourly Total	24	214	1	239	1	250	132	383	0	2	1	3	95	0	39	134	759
2:00 PM	5	57	0	62	0	70	26	96	0	0	0	0	28	1	6	35	193
2:15 PM	2	46	0	48	0	42	33	75	0	0	0	0	30	1	4	35	158
2:30 PM	5	73	0	78	0	58	49	107	0	0	0	0	47	0	4	51	236



2:45 PM	5	69	0	74	0	58	40	98	1	0	2	3	31	0	4	35	210
Hourly Total	17	245	0	262	0	228	148	376	1	0	2	3	136	2	18	156	797
3:00 PM	7	71	0	78	0	61	36	97	0	0	1	1	38	0	4	42	218
3:15 PM	1	67	0	68	1	66	34	101	0	0	0	0	28	0	5	33	202
3:30 PM	4	69	1	74	0	63	45	108	0	0	0	0	45	1	5	51	233
3:45 PM	5	63	0	68	0	63	38	101	1	0	0	1	34	0	7	41	211
Hourly Total	17	270	1	288	1	253	153	407	1	0	1	2	145	1	21	167	864
4:00 PM	4	80	1	85	0	50	43	93	0	0	0	0	51	2	5	58	236
4:15 PM	3	104	0	107	1	51	54	106	1	0	1	2	28	1	2	31	246
4:30 PM	9	133	0	142	0	63	48	111	0	1	0	1	37	0	4	41	295
4:45 PM	7	108	0	115	0	42	55	97	0	0	1	1	50	0	3	53	266
Hourly Total	23	425	1	449	1	206	200	407	1	1	2	4	166	3	14	183	1043
5:00 PM	21	141	0	162	1	74	61	136	0	0	0	0	42	0	6	48	346
5:15 PM	4	106	0	110	0	78	74	152	0	0	3	3	43	0	2	45	310
5:30 PM	14	89	0	103	0	60	51	111	0	0	0	0	47	0	8	55	269
5:45 PM	4	77	0	81	0	44	66	110	0	0	0	0	35	0	5	40	231
Hourly Total	43	413	0	456	1	256	252	509	0	0	3	3	167	0	21	188	1156
6:00 PM	3	51	0	54	0	43	44	87	0	0	0	0	28	0	3	31	172
6:15 PM	1	43	0	44	0	40	36	76	0	0	0	0	37	0	3	40	160
6:30 PM	7	35	0	42	0	36	67	103	0	0	0	0	24	0	0	24	169
6:45 PM	2	46	0	48	0	38	51	89	0	0	0	0	28	0	2	30	167
Hourly Total	13	175	0	188	0	157	198	355	0	0	0	0	117	0	8	125	668
7:00 PM	5	43	0	48	0	27	24	51	0	0	0	0	26	0	0	26	125
7:15 PM	0	30	0	30	0	31	27	58	1	0	0	1	33	1	1	35	124
7:30 PM	4	24	0	28	0	26	27	53	0	0	0	0	23	0	4	27	108
7:45 PM	0	23	0	23	0	25	32	57	0	0	0	0	26	0	3	29	109
Hourly Total	9	120	0	129	0	109	110	219	1	0	0	1	108	1	8	117	466
8:00 PM	2	19	0	21	0	17	19	36	0	0	0	0	14	0	0	14	71
8:15 PM	1	13	0	14	0	19	20	39	0	0	0	0	17	0	0	17	70
8:30 PM	3	16	0	19	0	16	19	35	0	0	0	0	4	0	0	4	58
8:45 PM	0	20	0	20	0	14	18	32	0	0	0	0	10	0	1	11	63
Hourly Total	6	68	0	74	0	66	76	142	0	0	0	0	45	0	1	46	262
9:00 PM	0	15	0	15	0	17	13	30	0	0	0	0	29	0	0	29	74
9:15 PM	1	13	0	14	0	15	10	25	0	0	1	1	24	1	0	25	65
9:30 PM	1	14	0	15	0	15	14	29	0	0	0	0	6	0	0	6	50
9:45 PM	1	5	0	6	0	10	3	13	0	0	0	0	3	0	1	4	23
Hourly Total	3	47	0	50	0	57	40	97	0	0	1	1	62	1	1	64	212
10:00 PM	1	15	0	16	0	18	8	26	0	0	0	0	4	0	0	4	46
10:15 PM	0	10	0	10	0	7	10	17	0	0	0	0	3	0	0	3	30
10:30 PM	1	8	0	9	0	8	3	11	0	0	0	0	2	0	0	2	22
10:45 PM	0	4	0	4	0	5	4	9	0	0	0	0	1	0	0	1	14
Hourly Total	2	37	0	39	0	38	25	63	0	0	0	0	10	0	0	10	112
11:00 PM	0	2	0	2	0	2	4	6	0	0	0	0	7	0	1	8	16
11:15 PM	1	4	0	5	0	5	3	8	0	0	0	0	2	0	1	3	16
11:30 PM	0	7	0	7	0	5	3	8	0	0	0	0	2	0	1	3	18
11:45 PM	0	2	0	2	0	5	5	10	0	0	0	0	3	0	1	4	16
Hourly Total	1	15	0	16	0	17	15	32	0	0	0	0	14	0	4	18	66
12:00 AM	1	3	0	4	0	3	1	4	0	0	0	0	2	0	0	2	10
12:15 AM	0	4	0	4	0	4	0	4	0	0	0	0	2	0	0	2	10
12:30 AM	0	0	0	0	0	2	1	3	0	0	0	0	2	0	0	2	5
12:45 AM	0	3	0	3	0	2	3	5	0	0	0	0	2	0	1	3	11
Hourly Total	1	10	0	11	0	11	5	16	0	0	0	0	8	0	1	9	36

1:00 AM	0	1	0	1	0	2	2	4	0	0	0	0	0	0	2	2	7
1:15 AM	1	1	0	2	0	1	1	2	0	0	0	0	0	0	1	1	5
1:30 AM	0	0	0	0	0	3	1	4	0	0	0	0	0	3	0	0	7
1:45 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	1	0	0	3
Hourly Total	1	3	0	4	0	7	4	11	0	0	0	0	0	4	0	3	22
2:00 AM	0	1	0	1	0	1	4	5	0	0	0	0	0	0	0	0	6
2:15 AM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
2:30 AM	0	1	0	1	0	1	1	2	0	0	0	0	0	1	0	0	4
2:45 AM	0	2	0	2	0	1	1	2	0	0	0	0	0	2	0	0	6
Hourly Total	0	5	0	5	0	3	7	10	0	0	0	0	0	3	0	0	18
3:00 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	1	0	0	3
3:15 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	1	0	0	4
3:30 AM	0	1	0	1	0	6	0	6	0	0	0	0	0	0	0	1	8
3:45 AM	0	1	0	1	0	5	1	6	0	0	0	0	0	1	0	0	8
Hourly Total	0	4	0	4	0	14	1	15	0	0	0	0	0	3	0	1	23
4:00 AM	0	3	0	3	0	2	2	4	0	0	0	0	0	1	0	0	8
4:15 AM	0	3	0	3	0	6	5	11	0	0	0	0	0	1	0	0	15
4:30 AM	0	4	0	4	0	13	2	15	0	0	0	0	0	3	0	0	22
4:45 AM	0	4	0	4	0	13	5	18	0	0	0	0	0	1	0	0	23
Hourly Total	0	14	0	14	0	34	14	48	0	0	0	0	0	6	0	0	68
5:00 AM	0	6	0	6	0	13	3	16	0	0	0	0	0	3	0	0	25
5:15 AM	0	9	0	9	0	21	5	26	0	0	0	0	0	5	0	1	41
5:30 AM	0	17	0	17	0	34	14	48	0	0	0	0	0	14	0	0	79
5:45 AM	1	21	0	22	0	44	18	62	0	0	0	0	0	23	0	4	111
Hourly Total	1	53	0	54	0	112	40	152	0	0	0	0	0	45	0	5	256
6:00 AM	0	20	0	20	0	35	11	46	0	0	0	0	0	18	0	1	85
6:15 AM	0	15	0	15	0	49	10	59	0	0	0	0	0	23	0	2	99
6:30 AM	1	34	0	35	0	67	8	75	0	0	0	0	0	24	0	5	139
6:45 AM	1	30	0	31	0	103	17	120	0	0	0	0	0	33	0	12	196
Hourly Total	2	99	0	101	0	254	46	300	0	0	0	0	0	98	0	20	519
7:00 AM	0	33	0	33	0	105	24	129	0	0	0	0	0	33	0	6	201
7:15 AM	1	49	0	50	0	99	33	132	0	0	0	0	0	36	1	3	222
7:30 AM	1	63	0	64	0	91	27	118	0	0	0	0	0	49	0	8	239
7:45 AM	4	49	0	53	0	116	38	154	0	0	0	0	0	54	0	8	269
Hourly Total	6	194	0	200	0	411	122	533	0	0	0	0	0	172	1	25	931
8:00 AM	4	41	0	45	1	90	29	120	0	0	0	0	0	28	2	10	205
8:15 AM	2	44	0	46	0	54	21	75	0	0	0	0	0	38	0	2	161
8:30 AM	2	52	0	54	1	65	22	88	0	0	3	3	3	23	2	8	178
8:45 AM	3	50	0	53	0	52	27	79	1	0	1	2	2	20	1	3	158
Hourly Total	11	187	0	198	2	261	99	362	1	0	4	5	5	109	5	23	702
9:00 AM	3	35	1	39	0	70	17	87	0	0	0	0	0	21	0	8	155
9:15 AM	4	35	0	39	0	39	17	56	0	1	0	0	1	20	0	4	120
9:30 AM	1	45	0	46	0	33	25	58	0	0	3	1	1	15	0	1	121
9:45 AM	6	56	0	62	0	44	23	67	0	0	0	0	0	25	1	4	159
Hourly Total	14	171	1	186	0	186	82	268	0	1	1	2	2	81	1	17	555
10:00 AM	7	43	0	50	0	42	19	61	0	0	1	1	1	17	0	7	136
10:15 AM	3	45	1	49	1	43	24	68	0	0	0	0	0	19	0	3	139
10:30 AM	2	37	0	39	0	52	23	75	1	0	1	2	2	28	1	6	151
10:45 AM	4	51	0	55	0	51	23	74	0	0	0	0	0	32	0	6	167
Hourly Total	16	176	1	193	1	188	89	278	1	0	2	3	3	96	1	22	593
11:00 AM	2	56	0	58	0	39	27	66	0	0	0	0	0	24	3	5	156
11:15 AM	7	58	0	65	1	58	24	83	0	2	0	2	2	25	0	5	180

11:30 AM	2	58	1	61	0	56	23	79	0	0	0	0	18	1	10	29	169
11:45 AM	5	57	0	62	0	42	27	69	0	2	2	4	28	0	5	33	168
Hourly Total	16	229	1	246	1	195	101	297	0	4	2	6	95	4	25	124	673
12:00 PM	20	103	1	124	2	56	35	93	0	0	2	2	19	0	6	25	244
12:15 PM	5	48	0	53	1	66	38	105	0	0	0	0	25	0	12	37	195
12:30 PM	1	54	0	55	0	63	37	100	0	0	1	1	26	1	13	40	196
12:45 PM	8	56	0	64	0	101	27	128	0	0	1	1	29	1	12	42	235
Hourly Total	34	261	1	296	3	286	137	426	0	0	4	4	99	2	43	144	870
1:00 PM	4	61	1	66	0	57	34	91	0	1	2	3	25	0	9	34	194
1:15 PM	9	48	0	57	0	72	38	110	0	1	0	1	24	1	6	31	199
1:30 PM	4	60	0	64	0	55	25	80	0	1	0	1	30	0	7	37	182
1:45 PM	4	68	1	73	0	57	30	87	0	0	2	2	20	1	6	27	189
Hourly Total	21	237	2	260	0	241	127	368	0	3	4	7	99	2	28	129	764
2:00 PM	6	46	0	52	0	42	36	78	0	0	1	1	25	1	4	30	161
2:15 PM	3	60	0	63	0	64	32	96	0	0	1	1	31	0	4	35	195
2:30 PM	8	73	0	81	0	63	35	98	0	1	0	1	45	0	4	49	229
2:45 PM	7	58	1	66	0	45	47	92	0	0	0	0	44	0	3	47	205
Hourly Total	24	237	1	262	0	214	150	364	0	1	2	3	145	1	15	161	790
3:00 PM	10	52	0	62	0	60	30	90	0	0	0	0	33	0	3	36	188
3:15 PM	3	57	0	60	0	53	47	100	0	0	0	0	22	0	9	31	191
3:30 PM	5	75	0	80	0	63	41	104	0	0	0	0	45	0	9	54	238
3:45 PM	4	81	1	86	1	60	42	103	0	0	1	1	38	2	3	43	233
Hourly Total	22	265	1	288	1	236	160	397	0	0	1	1	138	2	24	164	850
4:00 PM	9	98	1	108	0	61	57	118	0	0	0	0	46	0	8	54	280
4:15 PM	7	78	0	85	1	50	52	103	1	2	1	4	30	0	4	34	226
4:30 PM	8	127	1	136	0	59	52	111	1	0	0	1	41	0	5	46	294
4:45 PM	11	128	0	139	0	60	66	126	0	0	0	0	42	0	3	45	310
Hourly Total	35	431	2	468	1	230	227	458	2	2	1	5	159	0	20	179	1110
5:00 PM	25	145	0	170	0	94	62	156	1	1	2	4	37	0	4	41	371
5:15 PM	9	100	0	109	0	71	56	127	0	0	0	0	49	0	9	58	294
5:30 PM	6	97	0	103	0	51	65	116	0	0	0	0	46	0	7	53	272
5:45 PM	6	79	0	85	1	58	57	116	0	0	1	1	34	0	4	38	240
Hourly Total	46	421	0	467	1	274	240	515	1	1	3	5	166	0	24	190	1177
6:00 PM	1	63	0	64	0	40	44	84	0	0	0	0	59	0	2	61	209
6:15 PM	4	49	0	53	0	47	40	87	0	0	0	0	39	0	3	42	182
6:30 PM	3	40	0	43	0	52	44	96	0	0	0	0	31	0	5	36	175
6:45 PM	5	35	0	40	0	41	26	67	0	0	0	0	20	0	3	23	130
Hourly Total	13	187	0	200	0	180	154	334	0	0	0	0	149	0	13	162	696
7:00 PM	3	34	0	37	0	30	33	63	0	0	0	0	20	0	1	21	121
7:15 PM	7	38	0	45	0	23	34	57	0	0	0	0	37	0	1	38	140
7:30 PM	3	27	0	30	0	40	23	63	0	0	0	0	18	0	4	22	115
7:45 PM	2	24	0	26	0	26	27	53	0	0	0	0	26	0	3	29	108
Hourly Total	15	123	0	138	0	119	117	236	0	0	0	0	101	0	9	110	484
8:00 PM	0	34	0	34	0	22	20	42	0	0	0	0	15	0	0	15	91
8:15 PM	2	15	0	17	0	29	19	48	0	0	0	0	13	0	0	13	78
8:30 PM	3	16	0	19	0	24	26	50	0	0	0	0	15	0	0	15	84
8:45 PM	2	17	0	19	0	14	16	30	0	0	0	0	13	0	0	13	62
Hourly Total	7	82	0	89	0	89	81	170	0	0	0	0	56	0	0	56	315
9:00 PM	0	13	0	13	0	21	16	37	0	0	0	0	12	0	0	12	62
9:15 PM	1	13	0	14	0	18	15	33	0	0	0	0	3	0	3	6	53
9:30 PM	2	18	0	20	0	13	7	20	0	0	0	0	12	0	0	12	52
9:45 PM	0	7	0	7	0	10	9	19	0	0	0	0	5	0	2	7	33

Hourly Total	3	51	0	54	0	62	47	109	0	0	0	0	32	0	5	37	200
10:00 PM	0	12	0	12	0	8	10	18	0	0	0	0	9	0	0	9	39
10:15 PM	0	18	0	18	0	6	4	10	0	0	0	0	7	0	0	7	35
10:30 PM	0	10	0	10	0	9	8	17	0	0	0	0	4	0	1	5	32
10:45 PM	0	5	0	5	0	6	7	13	0	0	0	0	4	0	0	4	22
Hourly Total	0	45	0	45	0	29	29	58	0	0	0	0	24	0	1	25	128
11:00 PM	0	4	0	4	0	4	2	6	0	0	0	0	3	0	0	3	13
11:15 PM	0	2	0	2	0	3	4	7	0	0	0	0	2	0	0	2	11
11:30 PM	0	1	0	1	0	4	0	4	0	0	0	0	3	0	0	3	8
11:45 PM	1	2	0	3	0	4	2	6	0	0	0	0	1	0	0	1	10
Hourly Total	1	9	0	10	0	15	8	23	0	0	0	0	9	0	0	9	42
12:00 AM	0	6	0	6	0	0	1	1	0	0	0	0	2	0	0	2	9
12:15 AM	1	3	0	4	0	4	2	6	0	0	0	0	0	0	0	0	10
12:30 AM	1	2	0	3	0	3	2	5	0	0	0	0	2	0	0	2	10
12:45 AM	0	0	0	0	0	3	1	4	0	0	0	0	1	0	0	1	5
Hourly Total	2	11	0	13	0	10	6	16	0	0	0	0	5	0	0	5	34
1:00 AM	0	1	0	1	0	2	2	4	0	0	0	0	1	0	0	1	6
1:15 AM	0	3	0	3	0	0	1	1	0	0	0	0	1	0	1	2	6
1:30 AM	0	0	0	0	0	3	0	3	0	0	0	0	3	0	0	3	6
1:45 AM	0	3	0	3	0	2	3	5	0	0	0	0	1	0	0	1	9
Hourly Total	0	7	0	7	0	7	6	13	0	0	0	0	6	0	1	7	27
2:00 AM	1	2	0	3	0	5	4	9	0	0	0	0	1	0	0	1	13
2:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	2	0	0	2	3
2:30 AM	0	2	0	2	0	1	0	1	0	0	0	0	1	0	0	1	4
2:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Hourly Total	1	5	0	6	0	7	4	11	0	0	0	0	4	0	0	4	21
3:00 AM	1	1	0	2	0	3	0	3	0	0	0	0	0	0	0	0	5
3:15 AM	0	1	0	1	0	4	2	6	0	0	0	0	0	0	0	0	7
3:30 AM	0	0	0	0	0	4	0	4	0	0	0	0	1	0	1	2	6
3:45 AM	0	2	0	2	0	6	1	7	0	0	0	0	4	0	0	4	13
Hourly Total	1	4	0	5	0	17	3	20	0	0	0	0	5	0	1	6	31
4:00 AM	1	0	0	1	0	5	4	9	0	0	0	0	1	0	0	1	11
4:15 AM	0	4	0	4	0	5	1	6	0	0	0	0	2	0	0	2	12
4:30 AM	0	2	0	2	0	9	3	12	0	0	0	0	0	0	0	0	14
4:45 AM	0	10	0	10	0	10	5	15	0	0	0	0	2	0	1	3	28
Hourly Total	1	16	0	17	0	29	13	42	0	0	0	0	5	0	1	6	65
5:00 AM	0	7	0	7	0	11	3	14	0	0	0	0	6	0	1	7	28
5:15 AM	0	4	0	4	0	22	6	28	0	0	0	0	2	0	0	2	34
5:30 AM	1	16	0	17	0	34	11	45	0	0	0	0	15	0	0	15	77
5:45 AM	1	26	0	27	0	46	20	66	0	0	0	0	17	0	7	24	117
Hourly Total	2	53	0	55	0	113	40	153	0	0	0	0	40	0	8	48	256
6:00 AM	1	22	0	23	0	40	12	52	0	0	0	0	18	0	2	20	95
6:15 AM	1	20	0	21	0	53	11	64	0	0	1	1	20	0	3	23	109
6:30 AM	2	32	0	34	0	75	13	88	0	0	0	0	22	0	6	28	150
Grand Total	555	6945	15	7515	20	7282	4231	11533	11	19	41	71	3833	33	658	4524	23643
Approach %	7.4	92.4	0.2	-	0.2	63.1	36.7	-	15.5	26.8	57.7	-	84.7	0.7	14.5	-	-
Total %	2.3	29.4	0.1	31.8	0.1	30.8	17.9	48.8	0.0	0.1	0.2	0.3	16.2	0.1	2.8	19.1	-
Motorcycles	6	69	0	75	0	68	37	105	0	0	0	0	24	0	4	28	208
% Motorcycles	1.1	1.0	0.0	1.0	0.0	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.6	0.0	0.6	0.6	0.9
Cars	295	3655	5	3955	9	3944	3116	7069	3	8	20	31	2452	18	386	2856	13911
% Cars	53.2	52.6	33.3	52.6	45.0	54.2	73.6	61.3	27.3	42.1	48.8	43.7	64.0	54.5	58.7	63.1	58.8
Light Goods Vehicles	228	2385	5	2618	10	2408	893	3311	3	8	17	28	1153	12	239	1404	7361

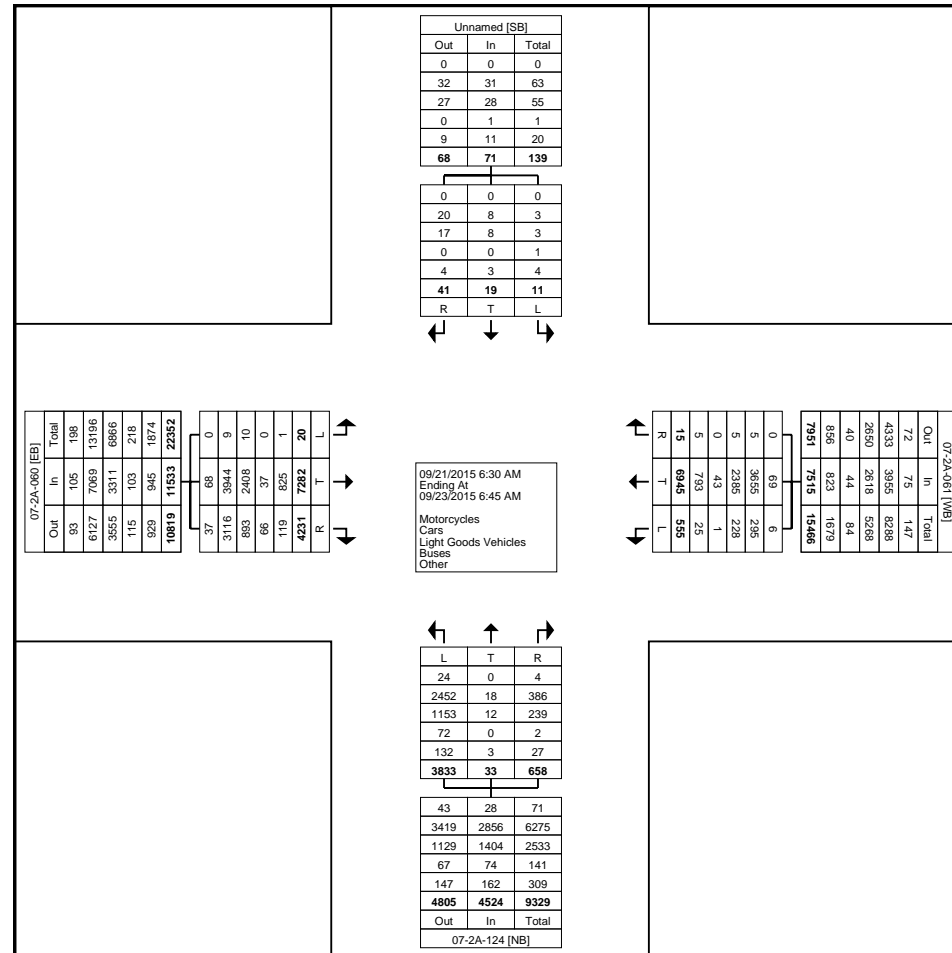
% Light Goods Vehicles	41.1	34.3	33.3	34.8	50.0	33.1	21.1	28.7	27.3	42.1	41.5	39.4	30.1	36.4	36.3	31.0	31.1
Buses	1	43	0	44	0	37	66	103	1	0	0	1	72	0	2	74	222
% Buses	0.2	0.6	0.0	0.6	0.0	0.5	1.6	0.9	9.1	0.0	0.0	1.4	1.9	0.0	0.3	1.6	0.9
Single-Unit Trucks	22	450	4	476	1	465	88	554	3	2	2	7	102	3	19	124	1161
% Single-Unit Trucks	4.0	6.5	26.7	6.3	5.0	6.4	2.1	4.8	27.3	10.5	4.9	9.9	2.7	9.1	2.9	2.7	4.9
Articulated Trucks	2	342	1	345	0	356	30	386	0	1	2	3	27	0	6	33	767
% Articulated Trucks	0.4	4.9	6.7	4.6	0.0	4.9	0.7	3.3	0.0	5.3	4.9	4.2	0.7	0.0	0.9	0.7	3.2
Bicycles on Road	1	1	0	2	0	4	1	5	1	0	0	1	3	0	2	5	13
% Bicycles on Road	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	9.1	0.0	0.0	1.4	0.1	0.0	0.3	0.1	0.1

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_38th (Cascade)  
Site Code:  
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Page No: 7

Location: 47.5210780102162, -  
111.241358667612



Turning Movement Data Plot



Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_38th (Cascade)  
Site Code:  
Start Date: 09/21/2015  
Page No: 8

Location: 47.5210780102162, -  
111.241358667612

### Turning Movement Peak Hour Data (7:15 AM)

Start Time	07-2A-061 Westbound				07-2A-060 Eastbound				Unnamed Southbound				07-2A-124 Northbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
7:15 AM	0	50	0	50	0	100	35	135	0	0	0	0	30	0	6	36	221
7:30 AM	3	49	0	52	0	99	36	135	0	0	0	0	54	0	7	61	248
7:45 AM	2	66	0	68	0	126	42	168	0	0	0	0	54	0	11	65	301
8:00 AM	3	43	0	46	2	82	28	112	0	0	0	0	48	1	2	51	209
Total	8	208	0	216	2	407	141	550	0	0	0	0	186	1	26	213	979
Approach %	3.7	96.3	0.0	-	0.4	74.0	25.6	-	NaN	NaN	NaN	-	87.3	0.5	12.2	-	-
Total %	0.8	21.2	0.0	22.1	0.2	41.6	14.4	56.2	0.0	0.0	0.0	0.0	19.0	0.1	2.7	21.8	-
PHF	0.667	0.788	0.000	0.794	0.250	0.808	0.839	0.818	0.000	0.000	0.000	0.000	0.861	0.250	0.591	0.819	0.813
Motorcycles	0	0	0	0	0	2	1	3	0	0	0	0	1	0	0	1	4
% Motorcycles	0.0	0.0	-	0.0	0.0	0.5	0.7	0.5	-	-	-	-	0.5	0.0	0.0	0.5	0.4
Cars	5	91	0	96	1	231	118	350	0	0	0	0	113	0	14	127	573
% Cars	62.5	43.8	-	44.4	50.0	56.8	83.7	63.6	-	-	-	-	60.8	0.0	53.8	59.6	58.5
Light Goods Vehicles	2	89	0	91	1	133	16	150	0	0	0	0	61	1	12	74	315
% Light Goods Vehicles	25.0	42.8	-	42.1	50.0	32.7	11.3	27.3	-	-	-	-	32.8	100.0	46.2	34.7	32.2
Buses	0	2	0	2	0	4	0	4	0	0	0	0	4	0	0	4	10
% Buses	0.0	1.0	-	0.9	0.0	1.0	0.0	0.7	-	-	-	-	2.2	0.0	0.0	1.9	1.0
Single-Unit Trucks	1	21	0	22	0	23	5	28	0	0	0	0	5	0	0	5	55
% Single-Unit Trucks	12.5	10.1	-	10.2	0.0	5.7	3.5	5.1	-	-	-	-	2.7	0.0	0.0	2.3	5.6
Articulated Trucks	0	5	0	5	0	14	1	15	0	0	0	0	1	0	0	1	21
% Articulated Trucks	0.0	2.4	-	2.3	0.0	3.4	0.7	2.7	-	-	-	-	0.5	0.0	0.0	0.5	2.1
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	-	-	0.5	0.0	0.0	0.5	0.1

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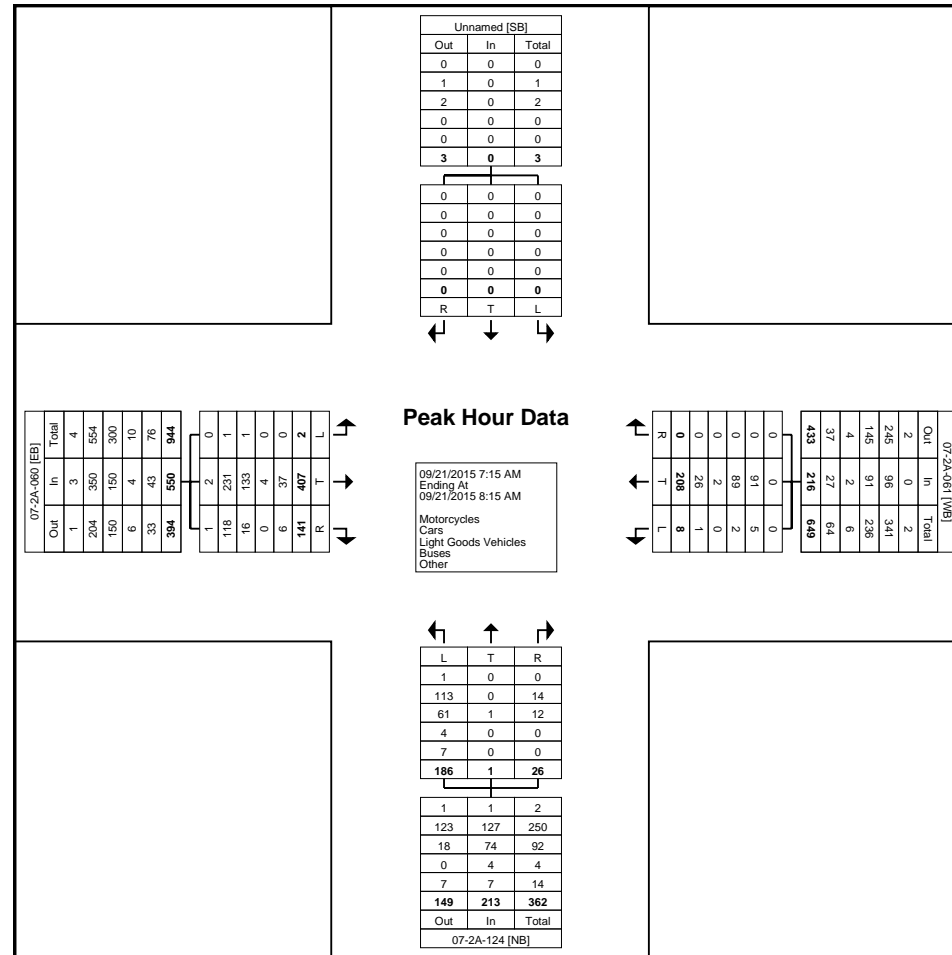
Count Name: Great Falls\_River\_38th (Cascade)

Site Code:

Start Date: 09/21/2015

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Location: 47.5210780102162, -  
111.241358667612



### Turning Movement Peak Hour Data Plot (7:15 AM)

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_38th (Cascade)  
Site Code:  
Start Date: 09/21/2015  
Page No: 10

Location: 47.5210780102162, -  
111.241358667612

### Turning Movement Peak Hour Data (12:45 PM)

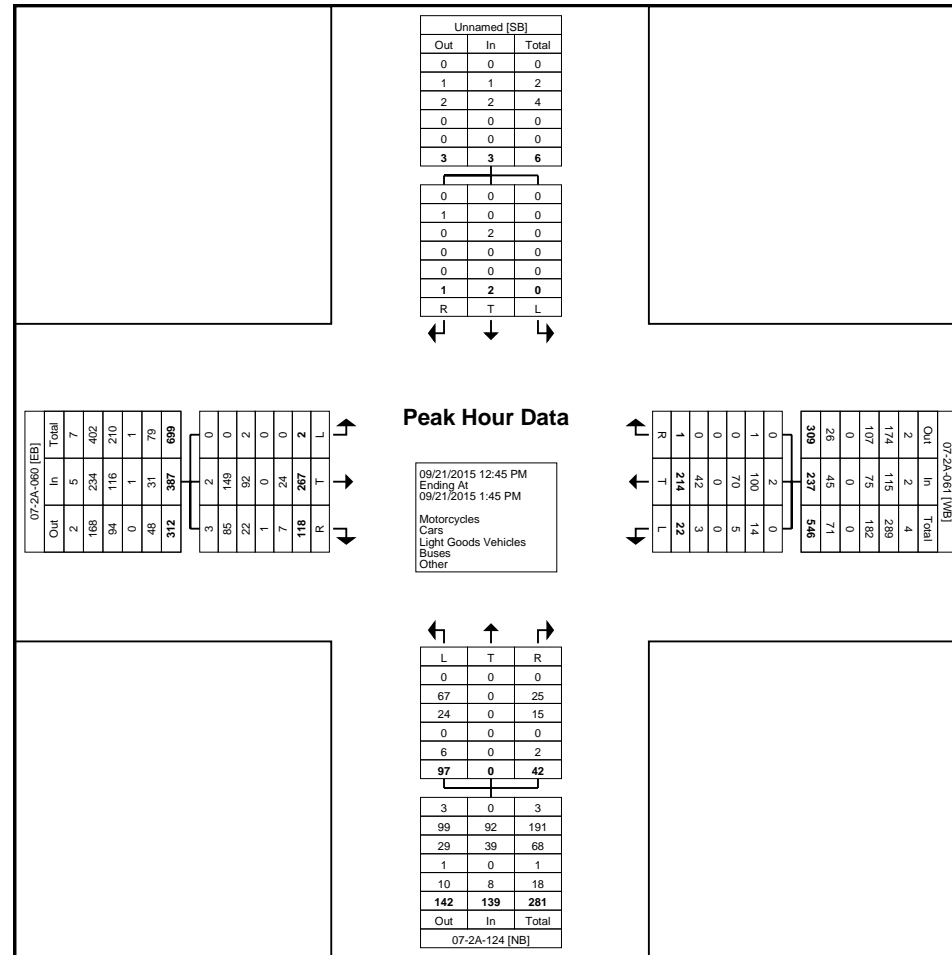
Start Time	07-2A-061 Westbound				07-2A-060 Eastbound				Unnamed Southbound				07-2A-124 Northbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
12:45 PM	6	56	0	62	1	82	26	109	0	0	0	0	31	0	11	42	213
1:00 PM	6	52	0	58	0	60	34	94	0	1	0	1	26	0	13	39	192
1:15 PM	5	52	1	58	0	63	30	93	0	0	1	1	16	0	7	23	175
1:30 PM	5	54	0	59	1	62	28	91	0	1	0	1	24	0	11	35	186
Total	22	214	1	237	2	267	118	387	0	2	1	3	97	0	42	139	766
Approach %	9.3	90.3	0.4	-	0.5	69.0	30.5	-	0.0	66.7	33.3	-	69.8	0.0	30.2	-	-
Total %	2.9	27.9	0.1	30.9	0.3	34.9	15.4	50.5	0.0	0.3	0.1	0.4	12.7	0.0	5.5	18.1	-
PHF	0.917	0.955	0.250	0.956	0.500	0.814	0.868	0.888	0.000	0.500	0.250	0.750	0.782	0.000	0.808	0.827	0.899
Motorcycles	0	2	0	2	0	2	3	5	0	0	0	0	0	0	0	0	7
% Motorcycles	0.0	0.9	0.0	0.8	0.0	0.7	2.5	1.3	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.9
Cars	14	100	1	115	0	149	85	234	0	0	1	1	67	0	25	92	442
% Cars	63.6	46.7	100.0	48.5	0.0	55.8	72.0	60.5	-	0.0	100.0	33.3	69.1	-	59.5	66.2	57.7
Light Goods Vehicles	5	70	0	75	2	92	22	116	0	2	0	2	24	0	15	39	232
% Light Goods Vehicles	22.7	32.7	0.0	31.6	100.0	34.5	18.6	30.0	-	100.0	0.0	66.7	24.7	-	35.7	28.1	30.3
Buses	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.3	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.1
Single-Unit Trucks	1	26	0	27	0	17	6	23	0	0	0	0	6	0	1	7	57
% Single-Unit Trucks	4.5	12.1	0.0	11.4	0.0	6.4	5.1	5.9	-	0.0	0.0	0.0	6.2	-	2.4	5.0	7.4
Articulated Trucks	2	16	0	18	0	7	1	8	0	0	0	0	0	0	1	1	27
% Articulated Trucks	9.1	7.5	0.0	7.6	0.0	2.6	0.8	2.1	-	0.0	0.0	0.0	0.0	-	2.4	0.7	3.5
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0

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Count Name: Great Falls\_River\_38th (Cascade)  
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Location: 47.5210780102162, -  
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### Turning Movement Peak Hour Data Plot (12:45 PM)

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_38th (Cascade)  
Site Code:  
Start Date: 09/21/2015  
Page No: 12

Location: 47.5210780102162, -  
111.241358667612

### Turning Movement Peak Hour Data (4:30 PM)

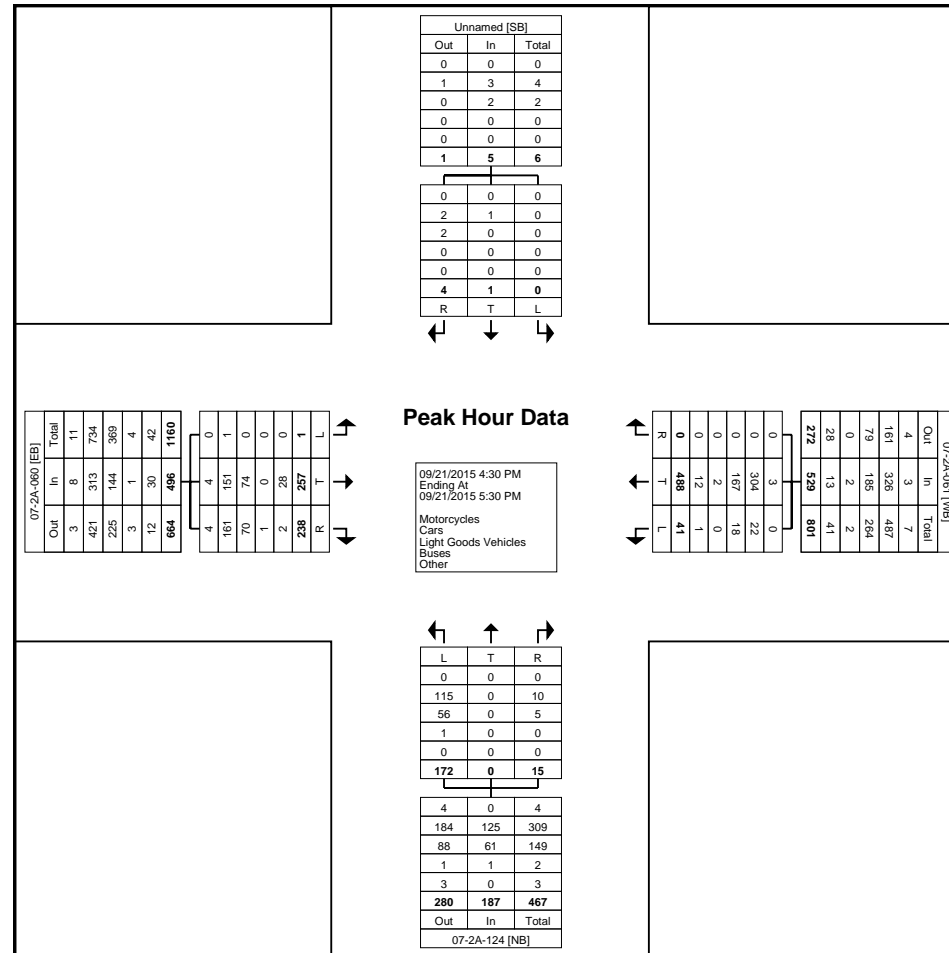
Start Time	07-2A-061 Westbound				07-2A-060 Eastbound				Unnamed Southbound				07-2A-124 Northbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
4:30 PM	9	133	0	142	0	63	48	111	0	1	0	1	37	0	4	41	295
4:45 PM	7	108	0	115	0	42	55	97	0	0	1	1	50	0	3	53	266
5:00 PM	21	141	0	162	1	74	61	136	0	0	0	0	42	0	6	48	346
5:15 PM	4	106	0	110	0	78	74	152	0	0	3	3	43	0	2	45	310
Total	41	488	0	529	1	257	238	496	0	1	4	5	172	0	15	187	1217
Approach %	7.8	92.2	0.0	-	0.2	51.8	48.0	-	0.0	20.0	80.0	-	92.0	0.0	8.0	-	-
Total %	3.4	40.1	0.0	43.5	0.1	21.1	19.6	40.8	0.0	0.1	0.3	0.4	14.1	0.0	1.2	15.4	-
PHF	0.488	0.865	0.000	0.816	0.250	0.824	0.804	0.816	0.000	0.250	0.333	0.417	0.860	0.000	0.625	0.882	0.879
Motorcycles	0	3	0	3	0	4	4	8	0	0	0	0	0	0	0	0	11
% Motorcycles	0.0	0.6	-	0.6	0.0	1.6	1.7	1.6	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.9
Cars	22	304	0	326	1	151	161	313	0	1	2	3	115	0	10	125	767
% Cars	53.7	62.3	-	61.6	100.0	58.8	67.6	63.1	-	100.0	50.0	60.0	66.9	-	66.7	66.8	63.0
Light Goods Vehicles	18	167	0	185	0	74	70	144	0	0	2	2	56	0	5	61	392
% Light Goods Vehicles	43.9	34.2	-	35.0	0.0	28.8	29.4	29.0	-	0.0	50.0	40.0	32.6	-	33.3	32.6	32.2
Buses	0	2	0	2	0	0	1	1	0	0	0	0	1	0	0	1	4
% Buses	0.0	0.4	-	0.4	0.0	0.0	0.4	0.2	-	0.0	0.0	0.0	0.6	-	0.0	0.5	0.3
Single-Unit Trucks	0	9	0	9	0	16	1	17	0	0	0	0	0	0	0	0	26
% Single-Unit Trucks	0.0	1.8	-	1.7	0.0	6.2	0.4	3.4	-	0.0	0.0	0.0	0.0	-	0.0	0.0	2.1
Articulated Trucks	0	3	0	3	0	11	1	12	0	0	0	0	0	0	0	0	15
% Articulated Trucks	0.0	0.6	-	0.6	0.0	4.3	0.4	2.4	-	0.0	0.0	0.0	0.0	-	0.0	0.0	1.2
Bicycles on Road	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
% Bicycles on Road	2.4	0.0	-	0.2	0.0	0.4	0.0	0.2	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.2

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Location: 47.5210780102162, -  
111.241358667612





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2701 Prospect

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Count Name: Great Falls\_River\_38th (Cascade)  
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Location: 47.5210780102162, -  
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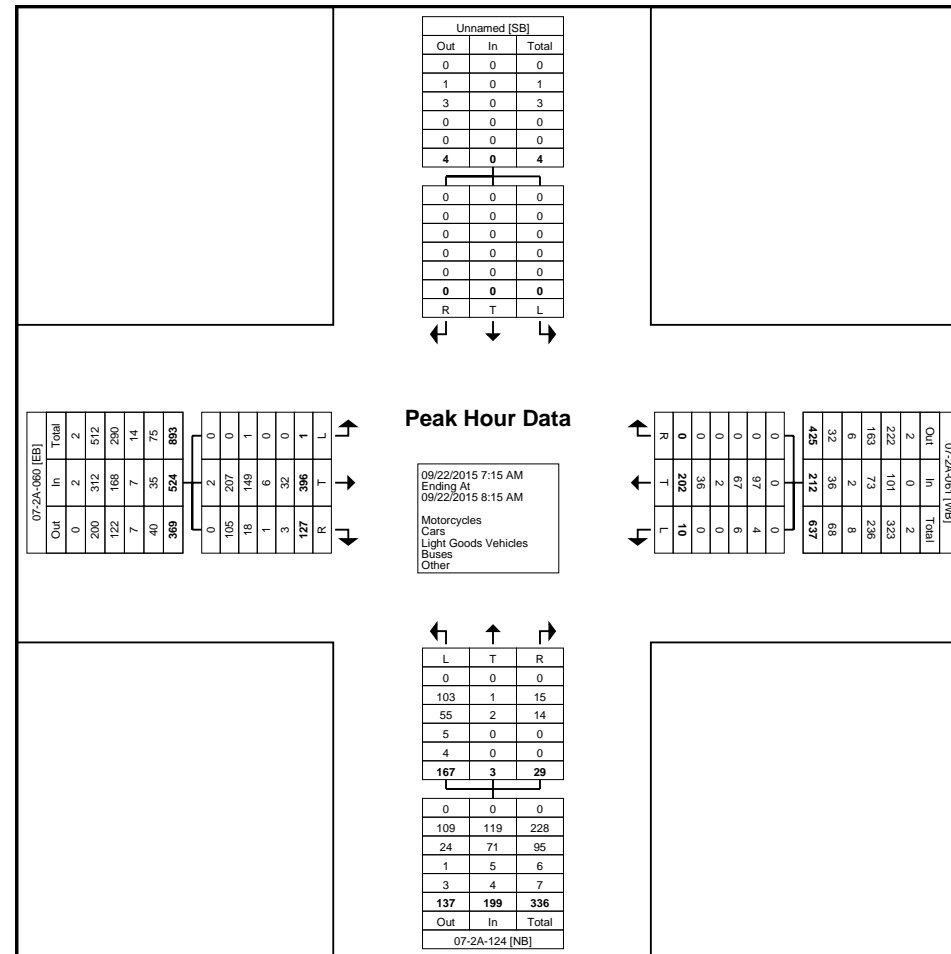
### Turning Movement Peak Hour Data (7:15 AM)

Start Time	07-2A-061 Westbound				07-2A-060 Eastbound				Unnamed Southbound				07-2A-124 Northbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
7:15 AM	1	49	0	50	0	99	33	132	0	0	0	0	36	1	3	40	222
7:30 AM	1	63	0	64	0	91	27	118	0	0	0	0	49	0	8	57	239
7:45 AM	4	49	0	53	0	116	38	154	0	0	0	0	54	0	8	62	269
8:00 AM	4	41	0	45	1	90	29	120	0	0	0	0	28	2	10	40	205
Total	10	202	0	212	1	396	127	524	0	0	0	0	167	3	29	199	935
Approach %	4.7	95.3	0.0	-	0.2	75.6	24.2	-	NaN	NaN	NaN	-	83.9	1.5	14.6	-	-
Total %	1.1	21.6	0.0	22.7	0.1	42.4	13.6	56.0	0.0	0.0	0.0	0.0	17.9	0.3	3.1	21.3	-
PHF	0.625	0.802	0.000	0.828	0.250	0.853	0.836	0.851	0.000	0.000	0.000	0.000	0.773	0.375	0.725	0.802	0.869
Motorcycles	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
% Motorcycles	0.0	0.0	-	0.0	0.0	0.5	0.0	0.4	-	-	-	-	0.0	0.0	0.0	0.0	0.2
Cars	4	97	0	101	0	207	105	312	0	0	0	0	103	1	15	119	532
% Cars	40.0	48.0	-	47.6	0.0	52.3	82.7	59.5	-	-	-	-	61.7	33.3	51.7	59.8	56.9
Light Goods Vehicles	6	67	0	73	1	149	18	168	0	0	0	0	55	2	14	71	312
% Light Goods Vehicles	60.0	33.2	-	34.4	100.0	37.6	14.2	32.1	-	-	-	-	32.9	66.7	48.3	35.7	33.4
Buses	0	2	0	2	0	6	1	7	0	0	0	0	5	0	0	5	14
% Buses	0.0	1.0	-	0.9	0.0	1.5	0.8	1.3	-	-	-	-	3.0	0.0	0.0	2.5	1.5
Single-Unit Trucks	0	26	0	26	0	18	2	20	0	0	0	0	4	0	0	4	50
% Single-Unit Trucks	0.0	12.9	-	12.3	0.0	4.5	1.6	3.8	-	-	-	-	2.4	0.0	0.0	2.0	5.3
Articulated Trucks	0	10	0	10	0	14	1	15	0	0	0	0	0	0	0	0	25
% Articulated Trucks	0.0	5.0	-	4.7	0.0	3.5	0.8	2.9	-	-	-	-	0.0	0.0	0.0	0.0	2.7
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	-	-	0.0	0.0	0.0	0.0	0.0

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406-444-9417

Location: 47.5210780102162, -  
111.241358667612

Count Name: Great Falls\_River\_38th (Cascade)  
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### Turning Movement Peak Hour Data Plot (7:15 AM)

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Count Name: Great Falls\_River\_38th (Cascade)  
Site Code:  
Start Date: 09/21/2015  
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Location: 47.5210780102162, -  
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### Turning Movement Peak Hour Data (12:00 PM)

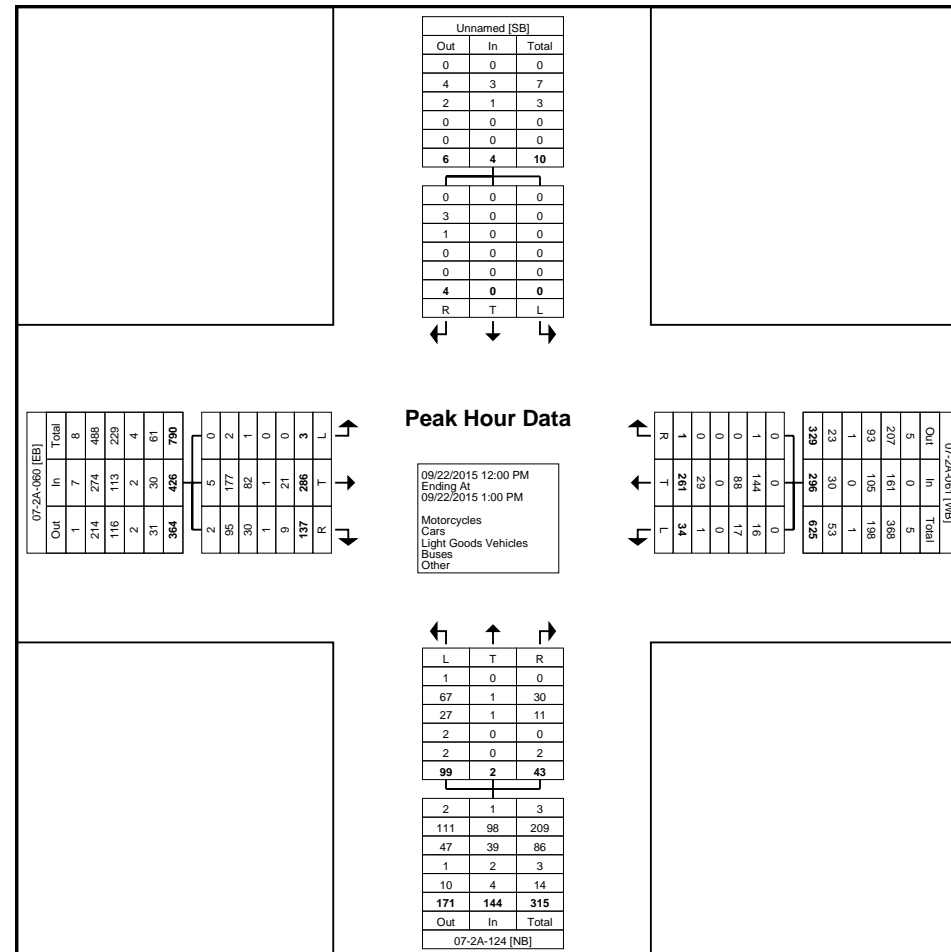
Start Time	07-2A-061 Westbound				07-2A-060 Eastbound				Unnamed Southbound				07-2A-124 Northbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
12:00 PM	20	103	1	124	2	56	35	93	0	0	2	2	19	0	6	25	244
12:15 PM	5	48	0	53	1	66	38	105	0	0	0	0	25	0	12	37	195
12:30 PM	1	54	0	55	0	63	37	100	0	0	1	1	26	1	13	40	196
12:45 PM	8	56	0	64	0	101	27	128	0	0	1	1	29	1	12	42	235
Total	34	261	1	296	3	286	137	426	0	0	4	4	99	2	43	144	870
Approach %	11.5	88.2	0.3	-	0.7	67.1	32.2	-	0.0	0.0	100.0	-	68.8	1.4	29.9	-	-
Total %	3.9	30.0	0.1	34.0	0.3	32.9	15.7	49.0	0.0	0.0	0.5	0.5	11.4	0.2	4.9	16.6	-
PHF	0.425	0.633	0.250	0.597	0.375	0.708	0.901	0.832	0.000	0.000	0.500	0.500	0.853	0.500	0.827	0.857	0.891
Motorcycles	0	0	0	0	0	5	2	7	0	0	0	0	1	0	0	1	8
% Motorcycles	0.0	0.0	0.0	0.0	0.0	1.7	1.5	1.6	-	-	0.0	0.0	1.0	0.0	0.0	0.7	0.9
Cars	16	144	1	161	2	177	95	274	0	0	3	3	67	1	30	98	536
% Cars	47.1	55.2	100.0	54.4	66.7	61.9	69.3	64.3	-	-	75.0	75.0	67.7	50.0	69.8	68.1	61.6
Light Goods Vehicles	17	88	0	105	1	82	30	113	0	0	1	1	27	1	11	39	258
% Light Goods Vehicles	50.0	33.7	0.0	35.5	33.3	28.7	21.9	26.5	-	-	25.0	25.0	27.3	50.0	25.6	27.1	29.7
Buses	0	0	0	0	0	1	1	2	0	0	0	0	2	0	0	2	4
% Buses	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.5	-	-	0.0	0.0	2.0	0.0	0.0	1.4	0.5
Single-Unit Trucks	1	14	0	15	0	10	6	16	0	0	0	0	1	0	1	2	33
% Single-Unit Trucks	2.9	5.4	0.0	5.1	0.0	3.5	4.4	3.8	-	-	0.0	0.0	1.0	0.0	2.3	1.4	3.8
Articulated Trucks	0	15	0	15	0	11	3	14	0	0	0	0	1	0	1	2	31
% Articulated Trucks	0.0	5.7	0.0	5.1	0.0	3.8	2.2	3.3	-	-	0.0	0.0	1.0	0.0	2.3	1.4	3.6
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Turning Movement Peak Hour Data Plot (12:00 PM)

Montana Department of Transportation  
2701 Prospect

Helena, Montana, United States 59620  
406-444-9417

Count Name: Great Falls\_River\_38th (Cascade)  
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Start Date: 09/21/2015  
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Location: 47.5210780102162, -  
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### Turning Movement Peak Hour Data (4:30 PM)

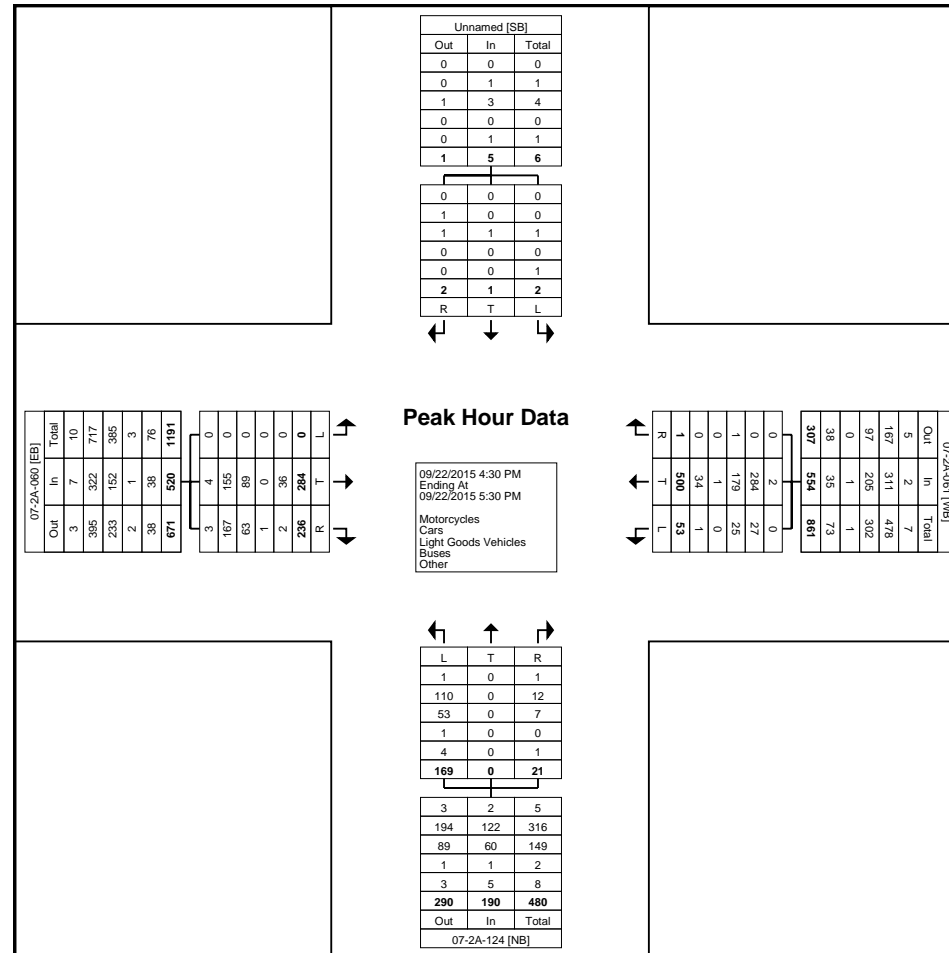
Start Time	07-2A-061 Westbound				07-2A-060 Eastbound				Unnamed Southbound				07-2A-124 Northbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
4:30 PM	8	127	1	136	0	59	52	111	1	0	0	1	41	0	5	46	294
4:45 PM	11	128	0	139	0	60	66	126	0	0	0	0	42	0	3	45	310
5:00 PM	25	145	0	170	0	94	62	156	1	1	2	4	37	0	4	41	371
5:15 PM	9	100	0	109	0	71	56	127	0	0	0	0	49	0	9	58	294
Total	53	500	1	554	0	284	236	520	2	1	2	5	169	0	21	190	1269
Approach %	9.6	90.3	0.2	-	0.0	54.6	45.4	-	40.0	20.0	40.0	-	88.9	0.0	11.1	-	-
Total %	4.2	39.4	0.1	43.7	0.0	22.4	18.6	41.0	0.2	0.1	0.2	0.4	13.3	0.0	1.7	15.0	-
PHF	0.530	0.862	0.250	0.815	0.000	0.755	0.894	0.833	0.500	0.250	0.250	0.313	0.862	0.000	0.583	0.819	0.855
Motorcycles	0	2	0	2	0	4	3	7	0	0	0	0	1	0	1	2	11
% Motorcycles	0.0	0.4	0.0	0.4	-	1.4	1.3	1.3	0.0	0.0	0.0	0.0	0.6	-	4.8	1.1	0.9
Cars	27	284	0	311	0	155	167	322	0	0	1	1	110	0	12	122	756
% Cars	50.9	56.8	0.0	56.1	-	54.6	70.8	61.9	0.0	0.0	50.0	20.0	65.1	-	57.1	64.2	59.6
Light Goods Vehicles	25	179	1	205	0	89	63	152	1	1	1	3	53	0	7	60	420
% Light Goods Vehicles	47.2	35.8	100.0	37.0	-	31.3	26.7	29.2	50.0	100.0	50.0	60.0	31.4	-	33.3	31.6	33.1
Buses	0	1	0	1	0	0	1	1	0	0	0	0	1	0	0	1	3
% Buses	0.0	0.2	0.0	0.2	-	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.6	-	0.0	0.5	0.2
Single-Unit Trucks	1	22	0	23	0	24	2	26	0	0	0	0	4	0	1	5	54
% Single-Unit Trucks	1.9	4.4	0.0	4.2	-	8.5	0.8	5.0	0.0	0.0	0.0	0.0	2.4	-	4.8	2.6	4.3
Articulated Trucks	0	12	0	12	0	12	0	12	0	0	0	0	0	0	0	0	24
% Articulated Trucks	0.0	2.4	0.0	2.2	-	4.2	0.0	2.3	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	1.9
Bicycles on Road	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	50.0	0.0	0.0	20.0	0.0	-	0.0	0.0	0.1

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Count Name: Great Falls\_River\_38th (Cascade)  
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Page No: 20

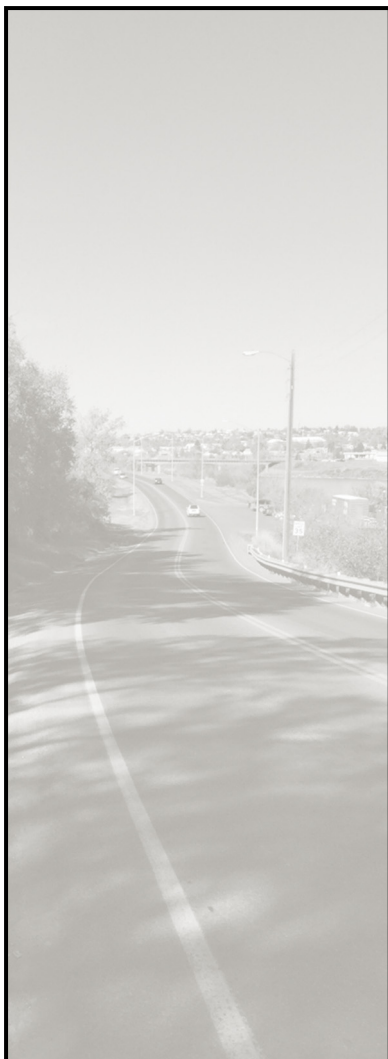
Location: 47.5210780102162, -  
111.241358667612



# Appendix C

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






















## *Existing Operational Analysis*



# HCM 2010 Signalized Intersection Summary

## 3: 15th St N & River Drive

11/4/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	352	86	12	144	218	72	242	47	393	195	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1776	1776	1776	1776	1776	1776	1776	1900	1900	1776	1900
Adj Flow Rate, veh/h	19	440	108	15	180	272	90	302	59	491	244	20
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	0	2	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	344	569	483	203	563	836	255	425	82	400	383	31
Arrive On Green	0.02	0.32	0.32	0.01	0.32	0.32	0.15	0.15	0.15	0.24	0.24	0.24
Sat Flow, veh/h	1691	1776	1509	1691	1776	1509	1691	2822	544	1691	1620	133
Grp Volume(v), veh/h	19	440	108	15	180	272	90	179	182	491	0	264
Grp Sat Flow(s),veh/h/ln	1691	1776	1509	1691	1776	1509	1691	1687	1680	1691	0	1752
Q Serve(g_s), s	0.5	16.1	3.8	0.4	5.5	7.1	3.4	7.2	7.4	17.0	0.0	9.7
Cycle Q Clear(g_c), s	0.5	16.1	3.8	0.4	5.5	7.1	3.4	7.2	7.4	17.0	0.0	9.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.08
Lane Grp Cap(c), veh/h	344	569	483	203	563	836	255	254	253	400	0	414
V/C Ratio(X)	0.06	0.77	0.22	0.07	0.32	0.33	0.35	0.70	0.72	1.23	0.00	0.64
Avail Cap(c_a), veh/h	420	902	767	285	902	1124	400	399	397	400	0	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.3	22.1	17.9	18.0	18.6	8.7	27.4	29.0	29.1	27.4	0.0	24.7
Incr Delay (d2), s/veh	0.1	2.3	0.2	0.2	0.3	0.2	0.8	3.6	3.8	122.6	0.0	3.2
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	0.3	8.2	1.6	0.2	2.8	4.5	1.7	3.6	3.7	21.4	0.0	5.1
LnGrp Delay(d),s/veh	16.4	24.4	18.1	18.1	19.0	9.0	28.2	32.6	32.9	150.0	0.0	27.9
LnGrp LOS	B	C	B	B	B	A	C	C	C	F		C
Approach Vol, veh/h		567			467			451			755	
Approach Delay, s/veh		22.9			13.1			31.8			107.3	
Approach LOS		C			B			C			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		15.8	6.0	28.0		22.0	6.3	27.8				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		17.0	4.5	36.5		17.0	4.5	36.5				
Max Q Clear Time (g_c+I1), s		9.4	2.4	18.1		19.0	2.5	9.1				
Green Ext Time (p_c), s		1.4	0.0	4.9		0.0	0.0	5.5				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			51.1									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh 2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	477	254	26	364	84	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	250	150	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	568	302	31	433	100	42

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	568
Stage 1	-	-	568
Stage 2	-	-	495
Critical Hdwy	-	4.17	6.47
Critical Hdwy Stg 1	-	-	5.47
Critical Hdwy Stg 2	-	-	5.47
Follow-up Hdwy	-	2.263	3.563
Pot Cap-1 Maneuver	-	980	242
Stage 1	-	-	557
Stage 2	-	-	602
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	980	234
Mov Cap-2 Maneuver	-	-	234
Stage 1	-	-	557
Stage 2	-	-	583




















Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	25.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	234	513	-	-	980	-
HCM Lane V/C Ratio	0.427	0.081	-	-	0.032	-
HCM Control Delay (s)	31.4	12.6	-	-	8.8	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	2	0.3	-	-	0.1	-

# HCM 2010 Signalized Intersection Summary

## 8: 38th St N & River Drive























11/4/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	391	135	8	200	0	184	1	26	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1759	1900	1759	1759	1900	1759	1759	1900	1900	1759	1900
Adj Flow Rate, veh/h	2	483	167	10	247	0	227	1	32	0	0	0
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	8	8	8	8	8	8	8	8	8	8	8	8
Cap, veh/h	671	647	224	361	911	0	539	9	292	0	352	0
Arrive On Green	0.52	0.52	0.52	0.52	0.52	0.00	0.20	0.20	0.20	0.00	0.00	0.00
Sat Flow, veh/h	1066	1251	432	735	1759	0	1675	46	1457	0	1759	0
Grp Volume(v), veh/h	2	0	650	10	247	0	227	0	33	0	0	0
Grp Sat Flow(s),veh/h/ln	1066	0	1683	735	1759	0	1675	0	1502	0	1759	0
Q Serve(g_s), s	0.0	0.0	10.8	0.4	2.8	0.0	4.4	0.0	0.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.8	0.0	10.8	11.1	2.8	0.0	4.4	0.0	0.6	0.0	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.00	1.00		0.97	0.00		0.00
Lane Grp Cap(c), veh/h	671	0	871	361	911	0	539	0	301	0	352	0
V/C Ratio(X)	0.00	0.00	0.75	0.03	0.27	0.00	0.42	0.00	0.11	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1021	0	1425	603	1490	0	1149	0	848	0	993	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	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	5.6	0.0	6.7	11.1	4.8	0.0	13.1	0.0	11.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.3	0.0	0.2	0.0	0.5	0.0	0.2	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	5.2	0.1	1.3	0.0	2.1	0.0	0.3	0.0	0.0	0.0
LnGrp Delay(d),s/veh	5.6	0.0	8.0	11.1	5.0	0.0	13.6	0.0	11.7	0.0	0.0	0.0
LnGrp LOS	A		A	B	A		B		B			
Approach Vol, veh/h		652			257			260			0	
Approach Delay, s/veh		8.0			5.2			13.4			0.0	
Approach LOS		A			A			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		12.1		23.3		12.1		23.3				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		20.0		30.0		20.0		30.0				
Max Q Clear Time (g_c+I1), s		6.4		12.8		0.0		13.1				
Green Ext Time (p_c), s		0.7		5.3		0.0		5.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			8.6									
HCM 2010 LOS			A									

# HCM 2010 Signalized Intersection Summary

## 3: 15th St N & River Drive

11/3/2015




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	253	82	40	178	244	139	297	79	241	205	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1792	1792	1792	1792	1792	1792	1900	1900	1792	1900
Adj Flow Rate, veh/h	21	275	89	43	193	265	151	323	86	262	223	17
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	0	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, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	305	432	368	282	459	702	306	479	126	350	337	26
Arrive On Green	0.02	0.24	0.24	0.03	0.26	0.26	0.18	0.18	0.18	0.21	0.21	0.21
Sat Flow, veh/h	1707	1792	1524	1707	1792	1524	1707	2671	701	1707	1645	125
Grp Volume(v), veh/h	21	275	89	43	193	265	151	204	205	262	0	240
Grp Sat Flow(s),veh/h/ln	1707	1792	1524	1707	1792	1524	1707	1703	1669	1707	0	1770
Q Serve(g_s), s	0.5	8.1	2.8	1.1	5.3	6.7	4.7	6.6	6.8	8.5	0.0	7.3
Cycle Q Clear(g_c), s	0.5	8.1	2.8	1.1	5.3	6.7	4.7	6.6	6.8	8.5	0.0	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		0.07
Lane Grp Cap(c), veh/h	305	432	368	282	459	702	306	306	300	350	0	363
V/C Ratio(X)	0.07	0.64	0.24	0.15	0.42	0.38	0.49	0.67	0.68	0.75	0.00	0.66
Avail Cap(c_a), veh/h	401	1112	945	357	1115	1260	490	489	479	493	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.4	20.0	18.0	16.4	18.3	10.4	21.7	22.5	22.6	22.0	0.0	21.5
Incr Delay (d2), s/veh	0.1	1.6	0.3	0.2	0.6	0.3	1.2	2.5	2.8	3.9	0.0	2.1
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	0.3	4.2	1.2	0.5	2.7	3.9	2.3	3.3	3.3	4.4	0.0	3.7
LnGrp Delay(d),s/veh	16.5	21.6	18.3	16.7	18.9	10.7	23.0	25.0	25.3	25.9	0.0	23.6
LnGrp LOS	B	C	B	B	B	B	C	C	C	C		C
Approach Vol, veh/h		385			501			560			502	
Approach Delay, s/veh		20.5			14.4			24.6			24.8	
Approach LOS		C			B			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		15.6	7.0	19.2		17.1	6.2	20.1				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		16.9	4.6	36.5		17.0	4.5	36.6				
Max Q Clear Time (g_c+I1), s		8.8	3.1	10.1		10.5	2.5	8.7				
Green Ext Time (p_c), s		1.8	0.0	4.1		1.6	0.0	4.1				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			21.2									
HCM 2010 LOS			C									

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	395	197	45	315	99	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	250	150	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8
Mvmt Flow	429	214	49	342	108	42
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	429	0	869	429
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	440	-
Critical Hdwy	-	-	4.18	-	6.48	6.28
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	2.272	-	3.572	3.372
Pot Cap-1 Maneuver	-	-	1099	-	315	613
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	637	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1099	-	301	613
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	609	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.1		20.1	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	301	613	-	-	1099	-
HCM Lane V/C Ratio	0.358	0.069	-	-	0.045	-
HCM Control Delay (s)	23.5	11.3	-	-	8.4	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.6	0.2	-	-	0.1	-

# HCM 2010 Signalized Intersection Summary

## 8: 38th St N & River Drive

11/3/2015






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	275	132	33	251	1	98	2	43	0	0	4
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1776	1900	1776	1776	1900	1776	1776	1900	1900	1776	1900
Adj Flow Rate, veh/h	3	309	148	37	282	1	110	2	48	0	0	4
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	624	496	237	482	772	3	510	10	252	0	0	261
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.17	0.17	0.17	0.00	0.00	0.17
Sat Flow, veh/h	1041	1136	544	887	1768	6	1341	61	1458	0	0	1509
Grp Volume(v), veh/h	3	0	457	37	0	283	110	0	50	0	0	4
Grp Sat Flow(s),veh/h/ln	1041	0	1680	887	0	1775	1341	0	1518	0	0	1509
Q Serve(g_s), s	0.0	0.0	5.4	0.9	0.0	2.7	1.9	0.0	0.7	0.0	0.0	0.1
Cycle Q Clear(g_c), s	2.8	0.0	5.4	6.3	0.0	2.7	2.0	0.0	0.7	0.0	0.0	0.1
Prop In Lane	1.00		0.32	1.00		0.00	1.00		0.96	0.00		1.00
Lane Grp Cap(c), veh/h	624	0	733	482	0	775	510	0	262	0	0	261
V/C Ratio(X)	0.00	0.00	0.62	0.08	0.00	0.37	0.22	0.00	0.19	0.00	0.00	0.02
Avail Cap(c_a), veh/h	862	0	1116	684	0	1179	1222	0	1068	0	0	1062
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	0.00	0.00	1.00
Uniform Delay (d), s/veh	5.8	0.0	5.6	8.0	0.0	4.8	9.6	0.0	9.1	0.0	0.0	8.8
Incr Delay (d2), s/veh	0.0	0.0	0.9	0.1	0.0	0.3	0.2	0.0	0.3	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	2.6	0.2	0.0	1.4	0.7	0.0	0.3	0.0	0.0	0.0
LnGrp Delay(d),s/veh	5.8	0.0	6.5	8.1	0.0	5.1	9.8	0.0	9.4	0.0	0.0	8.8
LnGrp LOS	A		A	A		A	A		A			A
Approach Vol, veh/h		460			320			160			4	
Approach Delay, s/veh		6.4			5.5			9.7			8.8	
Approach LOS		A			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		9.4		16.2		9.4		16.2				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		18.0		17.0		18.0		17.0				
Max Q Clear Time (g_c+I1), s		4.0		7.4		2.1		8.3				
Green Ext Time (p_c), s		0.5		3.1		0.5		3.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			6.7									
HCM 2010 LOS			A									



# HCM 2010 Signalized Intersection Summary

## 3: 15th St N & River Drive

11/4/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	326	92	39	313	403	149	435	53	338	206	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	21	362	102	43	348	448	166	483	59	376	229	28
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	0	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	221	532	452	255	555	824	337	603	73	394	362	44
Arrive On Green	0.02	0.29	0.29	0.03	0.30	0.30	0.19	0.19	0.19	0.22	0.22	0.22
Sat Flow, veh/h	1757	1845	1568	1757	1845	1568	1757	3147	383	1757	1613	197
Grp Volume(v), veh/h	21	362	102	43	348	448	166	268	274	376	0	257
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1757	1845	1568	1757	1752	1777	1757	0	1810
Q Serve(g_s), s	0.6	13.2	3.8	1.3	12.3	14.4	6.4	11.1	11.2	16.0	0.0	9.7
Cycle Q Clear(g_c), s	0.6	13.2	3.8	1.3	12.3	14.4	6.4	11.1	11.2	16.0	0.0	9.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		0.11
Lane Grp Cap(c), veh/h	221	532	452	255	555	824	337	336	341	394	0	406
V/C Ratio(X)	0.09	0.68	0.23	0.17	0.63	0.54	0.49	0.80	0.80	0.95	0.00	0.63
Avail Cap(c_a), veh/h	292	889	756	304	889	1108	394	393	399	394	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	23.9	20.5	19.2	22.8	11.9	27.3	29.2	29.2	29.0	0.0	26.5
Incr Delay (d2), s/veh	0.2	1.5	0.3	0.3	1.2	0.6	1.1	9.6	9.9	33.4	0.0	3.2
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	0.3	6.9	1.6	0.6	6.5	9.2	3.2	6.3	6.4	11.4	0.0	5.2
LnGrp Delay(d),s/veh	19.5	25.4	20.8	19.5	24.0	12.5	28.4	38.8	39.1	62.4	0.0	29.7
LnGrp LOS	B	C	C	B	C	B	C	D	D	E		C
Approach Vol, veh/h		485			839			708			633	
Approach Delay, s/veh		24.2			17.6			36.5			49.1	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.5	7.4	26.8		22.0	6.4	27.8				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		17.0	4.5	36.5		17.0	4.5	36.5				
Max Q Clear Time (g_c+I1), s		13.2	3.3	15.2		18.0	2.6	16.4				
Green Ext Time (p_c), s		1.4	0.0	6.5		0.0	0.0	6.4				
Intersection Summary												
HCM 2010 Ctrl Delay			31.3									
HCM 2010 LOS			C									

Intersection

Int Delay, s/veh 6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	494	256	54	622	100	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	250	150	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	568	294	62	715	115	32

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	568
Stage 1	-	-	568
Stage 2	-	-	839
Critical Hdwy	-	4.15	6.45
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	-	2.245	3.545
Pot Cap-1 Maneuver	-	989	151
Stage 1	-	-	561
Stage 2	-	-	419
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	989	142
Mov Cap-2 Maneuver	-	-	142
Stage 1	-	-	561
Stage 2	-	-	393




















Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	75.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	142	517	-	-	989	-
HCM Lane V/C Ratio	0.809	0.062	-	-	0.063	-
HCM Control Delay (s)	92.7	12.4	-	-	8.9	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	5.1	0.2	-	-	0.2	-

# HCM 2010 Signalized Intersection Summary

## 8: 38th St N & River Drive

11/4/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	273	227	51	480	1	167	0	21	2	1	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1900	1792	1792	1900	1792	1792	1900	1900	1792	1900
Adj Flow Rate, veh/h	0	317	264	59	558	1	194	0	24	2	1	2
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	202	467	389	406	923	2	478	0	309	220	110	126
Arrive On Green	0.00	0.52	0.52	0.52	0.52	0.52	0.20	0.00	0.20	0.20	0.20	0.20
Sat Flow, veh/h	815	905	754	799	1789	3	1355	0	1524	385	544	620
Grp Volume(v), veh/h	0	0	581	59	0	559	194	0	24	5	0	0
Grp Sat Flow(s),veh/h/ln	815	0	1659	799	0	1792	1355	0	1524	1549	0	0
Q Serve(g_s), s	0.0	0.0	9.3	2.1	0.0	7.8	4.6	0.0	0.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	9.3	11.4	0.0	7.8	4.7	0.0	0.5	0.1	0.0	0.0
Prop In Lane	1.00		0.45	1.00		0.00	1.00		1.00	0.40		0.40
Lane Grp Cap(c), veh/h	202	0	856	406	0	925	478	0	309	456	0	0
V/C Ratio(X)	0.00	0.00	0.68	0.15	0.00	0.60	0.41	0.00	0.08	0.01	0.00	0.00
Avail Cap(c_a), veh/h	309	0	1073	511	0	1159	851	0	728	864	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	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	6.4	10.6	0.0	6.1	13.2	0.0	11.5	11.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.2	0.2	0.0	0.6	0.6	0.0	0.1	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	4.5	0.5	0.0	3.9	1.8	0.0	0.2	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	7.6	10.8	0.0	6.7	13.7	0.0	11.6	11.3	0.0	0.0
LnGrp LOS			A	B		A	B		B	B		
Approach Vol, veh/h		581			618			218			5	
Approach Delay, s/veh		7.6			7.1			13.5			11.3	
Approach LOS		A			A			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		12.2		23.4		12.2		23.4				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		17.0		23.0		17.0		23.0				
Max Q Clear Time (g_c+I1), s		6.7		11.3		2.1		13.4				
Green Ext Time (p_c), s		0.5		5.7		0.6		5.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			8.3									
HCM 2010 LOS			A									

# Appendix D

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



















## *Projected Operational Analysis*



# HCM 2010 Signalized Intersection Summary

## 3: 15th St N & River Drive

11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	352	86	12	144	218	72	242	47	393	195	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1776	1776	1776	1776	1776	1776	1776	1900	1900	1776	1900
Adj Flow Rate, veh/h	22	517	126	18	211	320	106	355	69	577	286	23
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	0	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, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	311	599	509	152	594	928	262	437	84	474	454	37
Arrive On Green	0.02	0.34	0.34	0.02	0.33	0.33	0.15	0.15	0.15	0.28	0.28	0.28
Sat Flow, veh/h	1691	1776	1509	1691	1776	1509	1691	2824	543	1691	1622	130
Grp Volume(v), veh/h	22	517	126	18	211	320	106	211	213	577	0	309
Grp Sat Flow(s),veh/h/ln	1691	1776	1509	1691	1776	1509	1691	1687	1680	1691	0	1753
Q Serve(g_s), s	0.8	25.7	5.7	0.7	8.5	9.8	5.3	11.4	11.6	26.4	0.0	14.5
Cycle Q Clear(g_c), s	0.8	25.7	5.7	0.7	8.5	9.8	5.3	11.4	11.6	26.4	0.0	14.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.07
Lane Grp Cap(c), veh/h	311	599	509	152	594	928	262	261	260	474	0	491
V/C Ratio(X)	0.07	0.86	0.25	0.12	0.36	0.34	0.41	0.81	0.82	1.22	0.00	0.63
Avail Cap(c_a), veh/h	360	693	589	206	693	1012	310	310	308	474	0	491
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.4	29.2	22.6	23.6	23.7	8.9	35.9	38.5	38.6	33.9	0.0	29.7
Incr Delay (d2), s/veh	0.1	9.9	0.3	0.3	0.4	0.2	1.0	12.6	14.0	116.3	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	14.1	2.4	0.3	4.2	7.1	2.5	6.2	6.4	27.5	0.0	7.4
LnGrp Delay(d),s/veh	20.5	39.1	22.8	24.0	24.0	9.1	36.9	51.1	52.6	150.2	0.0	32.2
LnGrp LOS	C	D	C	C	C	A	D	D	D	F		C
Approach Vol, veh/h		665			549			530			886	
Approach Delay, s/veh		35.4			15.3			48.9			109.1	
Approach LOS		D			B			D			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.6	6.5	36.8		31.4	6.8	36.5				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		17.3	4.5	36.8		26.4	4.5	36.8				
Max Q Clear Time (g_c+I1), s		13.6	2.7	27.7		28.4	2.8	11.8				
Green Ext Time (p_c), s		1.0	0.0	4.1		0.0	0.0	6.6				
Intersection Summary												
HCM 2010 Ctrl Delay			58.7									
HCM 2010 LOS			E									

Intersection

Int Delay, s/veh 5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	477	254	26	364	84	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	250	150	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	700	373	38	534	123	51

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	700
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-




















Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	56.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	164	431	-	-	874	-
HCM Lane V/C Ratio	0.752	0.119	-	-	0.044	-
HCM Control Delay (s)	73.8	14.5	-	-	9.3	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	4.7	0.4	-	-	0.1	-

# HCM 2010 Signalized Intersection Summary

## 8: 38th St N & River Drive

11/24/2015






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	391	135	8	200	0	184	1	26	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1759	1900	1759	1759	1900	1759	1759	1900	1900	1759	1900
Adj Flow Rate, veh/h	3	574	198	12	293	0	270	1	38	0	0	0
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	0	1	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, %	8	8	8	8	8	8	8	8	8	8	8	8
Cap, veh/h	647	702	242	287	986	0	519	8	310	0	373	0
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.00	0.21	0.21	0.21	0.00	0.00	0.00
Sat Flow, veh/h	1022	1251	432	656	1759	0	1675	38	1463	0	1759	0
Grp Volume(v), veh/h	3	0	772	12	293	0	270	0	39	0	0	0
Grp Sat Flow(s),veh/h/ln	1022	0	1683	656	1759	0	1675	0	1501	0	1759	0
Q Serve(g_s), s	0.1	0.0	16.4	0.7	3.9	0.0	6.7	0.0	0.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.9	0.0	16.4	17.1	3.9	0.0	6.7	0.0	0.9	0.0	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.00	1.00		0.97	0.00		0.00
Lane Grp Cap(c), veh/h	647	0	944	287	986	0	519	0	318	0	373	0
V/C Ratio(X)	0.00	0.00	0.82	0.04	0.30	0.00	0.52	0.00	0.12	0.00	0.00	0.00
Avail Cap(c_a), veh/h	817	0	1224	396	1279	0	849	0	614	0	719	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	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	6.1	0.0	7.8	14.8	5.1	0.0	16.3	0.0	14.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	3.5	0.1	0.2	0.0	0.8	0.0	0.2	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	8.2	0.1	1.9	0.0	3.2	0.0	0.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	6.1	0.0	11.3	14.8	5.3	0.0	17.1	0.0	14.2	0.0	0.0	0.0
LnGrp LOS	A		B	B	A		B		B			
Approach Vol, veh/h		775			305			309			0	
Approach Delay, s/veh		11.3			5.6			16.7			0.0	
Approach LOS		B			A			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.3		29.7		14.3		29.7				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		18.0		32.0		18.0		32.0				
Max Q Clear Time (g_c+I1), s		8.7		18.4		0.0		19.1				
Green Ext Time (p_c), s		0.7		5.8		0.0		5.6				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									



# HCM 2010 Signalized Intersection Summary

## 3: 15th St N & River Drive

11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	253	82	40	178	244	139	297	79	241	205	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1792	1792	1792	1792	1792	1792	1900	1900	1792	1900
Adj Flow Rate, veh/h	28	371	120	59	261	358	204	436	116	354	301	23
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	0	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, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	271	510	433	242	534	790	339	530	140	376	363	28
Arrive On Green	0.02	0.28	0.28	0.04	0.30	0.30	0.20	0.20	0.20	0.22	0.22	0.22
Sat Flow, veh/h	1707	1792	1524	1707	1792	1524	1707	2667	704	1707	1645	126
Grp Volume(v), veh/h	28	371	120	59	261	358	204	277	275	354	0	324
Grp Sat Flow(s),veh/h/ln	1707	1792	1524	1707	1792	1524	1707	1703	1668	1707	0	1770
Q Serve(g_s), s	0.9	14.4	4.7	1.9	9.2	11.4	8.4	12.0	12.2	15.7	0.0	13.5
Cycle Q Clear(g_c), s	0.9	14.4	4.7	1.9	9.2	11.4	8.4	12.0	12.2	15.7	0.0	13.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		0.07
Lane Grp Cap(c), veh/h	271	510	433	242	534	790	339	338	331	376	0	390
V/C Ratio(X)	0.10	0.73	0.28	0.24	0.49	0.45	0.60	0.82	0.83	0.94	0.00	0.83
Avail Cap(c_a), veh/h	331	849	721	278	849	1057	376	375	368	376	0	390
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.2	24.9	21.4	19.8	22.2	11.7	28.1	29.6	29.6	29.6	0.0	28.7
Incr Delay (d2), s/veh	0.2	2.0	0.3	0.5	0.7	0.4	2.2	12.3	13.6	31.5	0.0	14.0
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	0.4	7.4	2.0	0.9	4.7	7.1	4.2	6.8	6.8	10.7	0.0	8.1
LnGrp Delay(d),s/veh	19.4	26.9	21.8	20.3	22.9	12.1	30.4	41.9	43.2	61.1	0.0	42.7
LnGrp LOS	B	C	C	C	C	B	C	D	D	E		D
Approach Vol, veh/h		519			678			756			678	
Approach Delay, s/veh		25.3			17.0			39.3			52.3	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.3	7.9	26.9		22.0	6.8	28.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		17.0	4.5	36.5		17.0	4.5	36.5				
Max Q Clear Time (g_c+I1), s		14.2	3.9	16.4		17.7	2.9	13.4				
Green Ext Time (p_c), s		1.1	0.0	5.5		0.0	0.0	5.7				
Intersection Summary												
HCM 2010 Ctrl Delay			34.1									
HCM 2010 LOS			C									

Intersection

Int Delay, s/veh 6.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	395	197	45	315	99	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	250	150	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8
Mvmt Flow	580	289	66	462	145	57

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	580
Stage 1	-	-	580
Stage 2	-	-	594
Critical Hdwy	-	4.18	6.48
Critical Hdwy Stg 1	-	-	5.48
Critical Hdwy Stg 2	-	-	5.48
Follow-up Hdwy	-	2.272	3.572
Pot Cap-1 Maneuver	-	965	206
Stage 1	-	-	548
Stage 2	-	-	540
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	965	192
Mov Cap-2 Maneuver	-	-	192
Stage 1	-	-	548
Stage 2	-	-	503




















Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	51
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	192	503	-	-	965	-
HCM Lane V/C Ratio	0.757	0.114	-	-	0.068	-
HCM Control Delay (s)	65.9	13.1	-	-	9	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	5	0.4	-	-	0.2	-

# HCM 2010 Signalized Intersection Summary

## 8: 38th St N & River Drive






















11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	275	132	33	251	1	98	2	43	0	0	4
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1776	1900	1776	1776	1900	1776	1776	1900	1900	1776	1900
Adj Flow Rate, veh/h	4	404	194	48	368	1	144	3	63	0	0	6
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	0	1	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, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	599	598	287	418	932	3	448	12	261	0	0	271
Arrive On Green	0.53	0.53	0.53	0.53	0.53	0.53	0.18	0.18	0.18	0.00	0.00	0.18
Sat Flow, veh/h	962	1135	545	779	1770	5	1339	69	1451	0	0	1509
Grp Volume(v), veh/h	4	0	598	48	0	369	144	0	66	0	0	6
Grp Sat Flow(s),veh/h/ln	962	0	1680	779	0	1775	1339	0	1520	0	0	1509
Q Serve(g_s), s	0.1	0.0	8.9	1.6	0.0	4.2	3.4	0.0	1.3	0.0	0.0	0.1
Cycle Q Clear(g_c), s	4.3	0.0	8.9	10.6	0.0	4.2	3.5	0.0	1.3	0.0	0.0	0.1
Prop In Lane	1.00		0.32	1.00		0.00	1.00		0.95	0.00		1.00
Lane Grp Cap(c), veh/h	599	0	884	418	0	935	448	0	273	0	0	271
V/C Ratio(X)	0.01	0.00	0.68	0.11	0.00	0.39	0.32	0.00	0.24	0.00	0.00	0.02
Avail Cap(c_a), veh/h	855	0	1332	625	0	1408	915	0	804	0	0	798
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	0.00	0.00	1.00
Uniform Delay (d), s/veh	6.1	0.0	5.9	9.8	0.0	4.8	12.9	0.0	12.0	0.0	0.0	11.5
Incr Delay (d2), s/veh	0.0	0.0	0.9	0.1	0.0	0.3	0.4	0.0	0.5	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	0.0	4.2	0.4	0.0	2.1	1.3	0.0	0.6	0.0	0.0	0.0
LnGrp Delay(d),s/veh	6.1	0.0	6.8	9.9	0.0	5.1	13.4	0.0	12.4	0.0	0.0	11.5
LnGrp LOS	A		A	A		A	B		B			B
Approach Vol, veh/h		602			417			210			6	
Approach Delay, s/veh		6.8			5.6			13.1			11.5	
Approach LOS		A			A			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.1		22.9		11.1		22.9				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		18.0		27.0		18.0		27.0				
Max Q Clear Time (g_c+I1), s		5.5		10.9		2.1		12.6				
Green Ext Time (p_c), s		0.6		5.7		0.7		5.4				
Intersection Summary												
HCM 2010 Ctrl Delay			7.5									
HCM 2010 LOS			A									

# HCM 2010 Signalized Intersection Summary

## 3: 15th St N & River Drive

12/9/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	326	92	39	313	403	149	435	53	338	206	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	28	478	135	57	459	591	219	638	78	496	302	37
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	0	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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	171	597	507	200	618	888	371	664	81	406	373	46
Arrive On Green	0.02	0.32	0.32	0.03	0.34	0.34	0.21	0.21	0.21	0.23	0.23	0.23
Sat Flow, veh/h	1757	1845	1568	1757	1845	1568	1757	3145	384	1757	1612	198
Grp Volume(v), veh/h	28	478	135	57	459	591	219	355	361	496	0	339
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1757	1845	1568	1757	1752	1777	1757	0	1810
Q Serve(g_s), s	1.1	23.5	6.3	2.1	21.9	26.1	11.2	19.9	20.0	23.0	0.0	17.6
Cycle Q Clear(g_c), s	1.1	23.5	6.3	2.1	21.9	26.1	11.2	19.9	20.0	23.0	0.0	17.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		0.11
Lane Grp Cap(c), veh/h	171	597	507	200	618	888	371	370	375	406	0	418
V/C Ratio(X)	0.16	0.80	0.27	0.29	0.74	0.67	0.59	0.96	0.96	1.22	0.00	0.81
Avail Cap(c_a), veh/h	213	677	575	221	677	938	371	370	375	406	0	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.0	30.7	24.9	24.3	29.3	15.0	35.4	38.8	38.8	38.2	0.0	36.2
Incr Delay (d2), s/veh	0.4	6.1	0.3	0.8	4.0	1.7	2.5	36.2	36.5	119.8	0.0	11.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	13.0	2.8	1.1	11.8	16.5	5.7	13.4	13.6	24.6	0.0	10.1
LnGrp Delay(d),s/veh	24.4	36.8	25.2	25.0	33.3	16.7	37.8	75.1	75.4	158.1	0.0	47.6
LnGrp LOS	C	D	C	C	C	B	D	E	E	F		D
Approach Vol, veh/h		641			1107			935			835	
Approach Delay, s/veh		33.8			24.0			66.5			113.2	
Approach LOS		C			C			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		26.0	8.3	37.2		28.0	7.2	38.3				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		21.0	4.5	36.5		23.0	4.5	36.5				
Max Q Clear Time (g_c+I1), s		22.0	4.1	25.5		25.0	3.1	28.1				
Green Ext Time (p_c), s		0.0	0.0	6.3		0.0	0.0	5.2				
Intersection Summary												
HCM 2010 Ctrl Delay			58.3									
HCM 2010 LOS			E									

Intersection

Int Delay, s/veh 33.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	494	256	54	622	100	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	250	150	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	725	376	79	913	147	41

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	725
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	\$ 407.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	79	420	-	-	864	-
HCM Lane V/C Ratio	1.857	0.098	-	-	0.092	-
HCM Control Delay (s)	\$ 517.9	14.5	-	-	9.6	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	12.8	0.3	-	-	0.3	-




















Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# HCM 2010 Signalized Intersection Summary

## 8: 38th St N & River Drive

12/9/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	273	227	51	480	1	167	0	21	2	1	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1900	1792	1792	1900	1792	1792	1900	1900	1792	1900
Adj Flow Rate, veh/h	0	401	333	75	704	1	245	0	31	3	1	3
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	0	1	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, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	143	525	436	313	1037	1	445	0	338	209	84	143
Arrive On Green	0.00	0.58	0.58	0.58	0.58	0.58	0.22	0.00	0.22	0.22	0.22	0.22
Sat Flow, veh/h	712	907	753	693	1789	3	1354	0	1524	482	378	646
Grp Volume(v), veh/h	0	0	734	75	0	705	245	0	31	7	0	0
Grp Sat Flow(s),veh/h/ln	712	0	1660	693	0	1792	1354	0	1524	1506	0	0
Q Serve(g_s), s	0.0	0.0	16.8	4.6	0.0	13.7	8.4	0.0	0.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	16.8	21.4	0.0	13.7	8.6	0.0	0.8	0.2	0.0	0.0
Prop In Lane	1.00		0.45	1.00		0.00	1.00		1.00	0.43		0.43
Lane Grp Cap(c), veh/h	143	0	961	313	0	1038	445	0	338	436	0	0
V/C Ratio(X)	0.00	0.00	0.76	0.24	0.00	0.68	0.55	0.00	0.09	0.02	0.00	0.00
Avail Cap(c_a), veh/h	184	0	1056	353	0	1140	629	0	545	635	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	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	8.0	16.0	0.0	7.3	18.6	0.0	15.5	15.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	3.1	0.4	0.0	1.5	1.1	0.0	0.1	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	8.4	0.9	0.0	7.1	3.3	0.0	0.3	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	11.0	16.4	0.0	8.8	19.6	0.0	15.7	15.3	0.0	0.0
LnGrp LOS			B	B		A	B		B	B		
Approach Vol, veh/h		734			780			276			7	
Approach Delay, s/veh		11.0			9.5			19.2			15.3	
Approach LOS		B			A			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		16.2		34.1		16.2		34.1				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		18.0		32.0		18.0		32.0				
Max Q Clear Time (g_c+I1), s		10.6		18.8		2.2		23.4				
Green Ext Time (p_c), s		0.6		7.9		0.8		5.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			11.7									
HCM 2010 LOS			B									