

# **BI-MART** **WILLAMETTE COUNTRY** **MUSIC** **FESTIVAL**

## Transportation Impact Analysis

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Project No. 1117



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## **EXECUTIVE SUMMARY**

This transportation impact analysis summarizes our traffic impact study/traffic control plan for the Willamette Country Music Festival's planned relocation to the Marion County Ankeny Hill area in August 2019. The four-day event is planned to operate from August 15<sup>th</sup> to August 18<sup>th</sup> (campers will leave the morning of the 19<sup>th</sup>) and will host up to 30,000 total attendees (including staff, vendors, security, support staff, artists, and volunteers). The event will include 3,000 marked camping sites, and includes on-site support facilities and entertainment throughout the day, with main venue gates opening around the noon hour and performances continuing as late as 10:30 p.m. The site will use fields adjacent to the Ankeny Wildlife Refuge that will have been harvested prior to the event setup.

This study is the result of traffic planning and analysis based on coordination with Marion County, the Oregon Department of Transportation (ODOT), area residents, farmers, associated food processors, and business owners in the Festival vicinity. This study also benefits from the knowledge base developed by the Willamette Country Music Festival (WCMF) team that has coordinated similar music festivals over the past 10 years in various locations in Oregon and Idaho. It is the goal of WCMF to avoid or minimize impacts to the farming community, area business owners, the Wildlife Refuge, as well as provide safe and functional ingress and egress to the event.

Primary issues raised within the site vicinity include potential conflicts with area agricultural uses and increased traffic around the perimeter of the wildlife refuge. Based on outreach efforts the harvesting of most area crops will not be active during the mid-August timeframe, although there is a potential for certain types of grass seed, silage, and vegetables. Accordingly, event routes were developed to minimize use of the surrounding County roads and maintain reasonable I-5 access or ability to use the overcrossings. With 85 percent of the event traffic expected to arrive from I-5, the limited amount of remaining traffic will allow these County roads to operate in their current configurations. The proposed event routing has been revised from prior presentations to address these area concerns, with the proposed routing illustrated in Figure 1.

There will be traffic control changes required to allow this event route to function adequately while minimizing the potential for queuing onto I-5. This will require changing traffic control at intersections along the routes to maintain free-flowing maneuvers for event traffic. Festival flagging crews will be required at the I-5 interchange ramp terminals and at major intersections surrounding the event to direct passenger vehicles and RV's to their respective parking areas.

In addition, the team has identified changes to the internal parking configuration to reduce conflicts between pedestrians and vehicles, increase internal stacking, and increase in-processing time (particularly for campers). Beyond the physical event changes, published information in printed and website materials will be provided to attendees to highlight the routes, warn travelers of dimensional restrictions, request respectful behavior toward area neighbors and land uses, and establish event rules and local restrictions.

The traffic mitigation strategy has been designed to reduce impacts to local traffic, farming, wildlife refuge, and business operations. These changes will result in higher delays to attendees within the parking areas leaving the event each night of the Festival. However, with this routing plan even during the peak event hours, local traffic on Talbot Road will experience limited delays between Jorgenson Road and I-5, as traffic will be traveling at 15 to 20 mph in this area and local traffic will have the right-of-way to enter the queue. It is recommended that local traffic in the Talbot area utilize Talbot Road as a route to I-5 or locations to the east of I-5 between the hours of 9:00 p.m. and midnight as this route will provide the most expeditious travel option as compared to Wintel Road.

## *Willamette Country Music Festival TIA*

The very limited traffic associated with the Festival set-up and take-down will involve limited crews with direct access to and from I-5 via the Ankeny Hill Road and Talbot Road interchanges. Local traffic, farming and business operations will not be impacted during this time period and there will be no detours or traffic control changes in place.

WCMF staff that will be supporting the event includes on-site security teams, first responders, tow trucks, and flagging crews. These emergency service providers will help provide the appropriate security and emergency medical services within the site. A daily conference call will be conducted with area farmers at 6:00 a.m. each morning to coordinate daily delivery and equipment movement needs and ensure flagging crews are aware. A neighborhood liaison number will also be provided for area farmers experiencing any issues to directly contact event management staff. This information will allow the Festival Command Center to plan for the movement of oversize equipment, revise Festival traffic patterns, and prepare flaggers to assist and control Festival traffic throughout the event.

With the proposed routes and control measures in place the proposed 2019 relocation of the Willamette Country Music Festival to the Ankeny Hill area can be accommodated with minimal impact to area farming operations. Additional details on the analyses performed and specific recommendation measures are provided within this report.

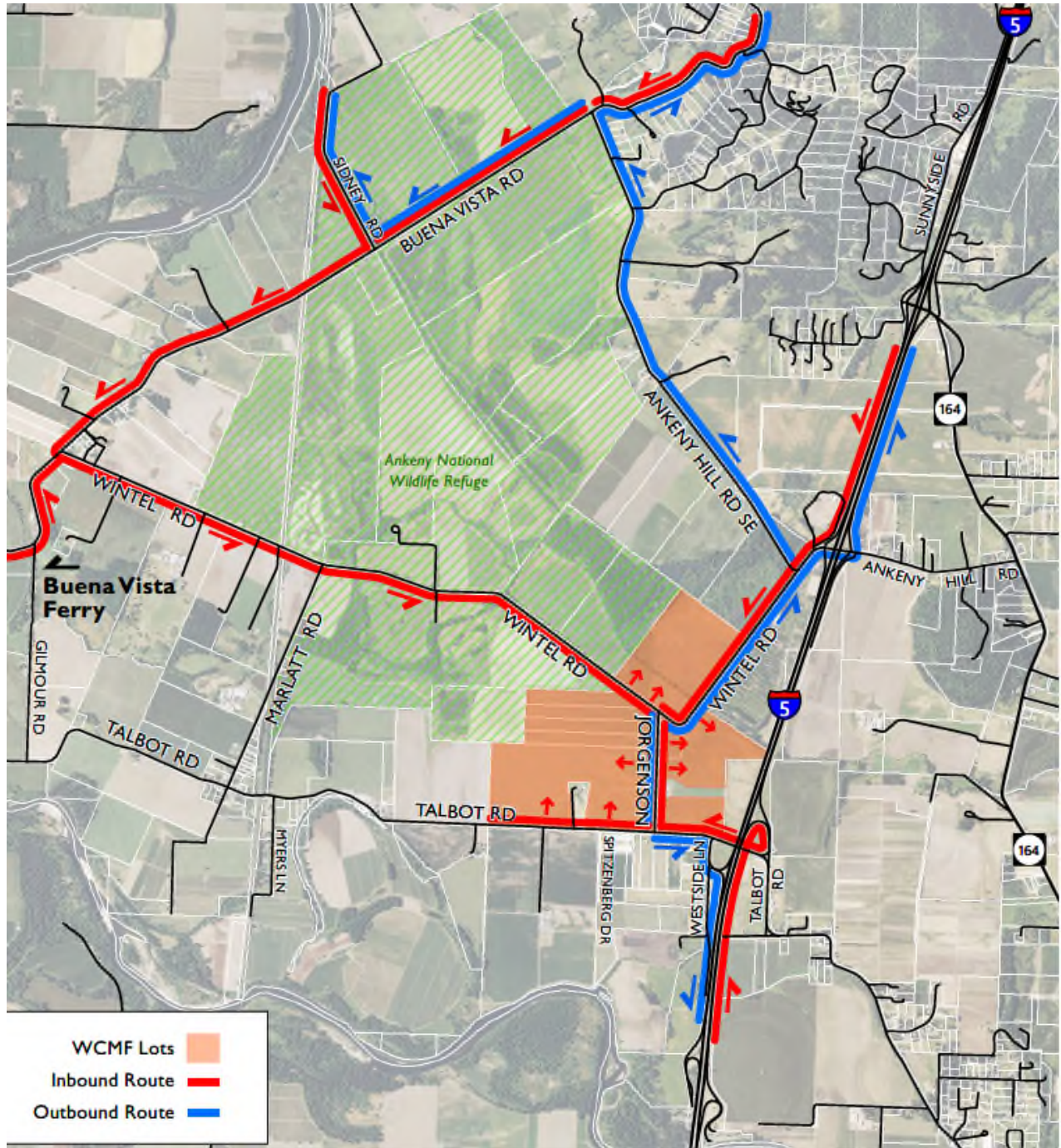


Figure 1. Proposed Event Routes

## PROJECT PURPOSE

The purpose of this Transportation Impact Analysis (TIA) is to identify potential traffic capacity, safety, and operations constraints associated with traffic destined to the proposed 2019 Willamette Country Music Festival (WCMF, the “festival”), which is planned to occur from Thursday, August 15<sup>th</sup> through Sunday, August 18<sup>th</sup>, 2019. This TIA provides this analysis and identifies specific recommendations to accommodate the projected traffic demands and routing. The specific location of the proposed festival site (the Site) is illustrated in Figure 2.

Specific items to be addressed in the TIA were provided to the consultant team by Marion County (Regulatory Agency for the proposed festival) Engineering staff and ODOT, Region 2 and District 4 staff. (Refer to *Approval Criteria* section of this report).

Proposed mitigation strategies and plans are incorporated into the TIA and through the Temporary Traffic Control Plan (TTCP) strategies which are identified within this TIA. It is understood that approval of the final 2019 TTCP will be through a series of reviews and meetings with Marion County and ODOT staff, though it is acknowledged that mitigation measures will include temporary revisions to existing road signs, construction of temporary driveways, identification of an emergency route(s), variable message signs on I-5 to the north and south of the Festival, close coordination with ODOT District 4 Incident Response (IR), flaggers, and an on-site traffic control center.

## PROJECT BACKGROUND

The Festival has been held in Brownsville for the past 10 years (2018 will be its 10<sup>th</sup> year in its current location). The Festival features four consecutive days of concerts that start around 4:00 p.m. on Thursday and continue until 10:00 p.m. Sunday. The Festival is held in a large field with a sound stage and is supported by food and beverage vendors. Travel is accommodated primarily by personal automobile, with adjacent fields designated for event parking and overnight camping.

In addition to Festival attendees, there are also numerous volunteers and staff required to organize and manage the Festival. Performers typically arrive by bus with their equipment and support staff in early morning hours and are set up backstage. An on-site area is designated as the impound lot for towed vehicles. Emergency service vehicles are also staged on-site to respond to emergency or medical issues that may arise during the Festival. Figure 3 illustrates the Festival layout highlighting the scale and support accommodations necessary. This map highlights the range of requirements to support the Festival over the four-day period (not including setup/tear-down), including hygiene facilities, on-site accommodations for emergency services personnel and vendors, and the range of ticket classes. illustrates the Festival layout highlighting the scale and support accommodations necessary. This map highlights the range of requirements to support the Festival over the four-day period (not including setup/tear-down), including hygiene facilities, on-site accommodations for emergency services personnel and vendors, and the range of ticket classes.

Preparations for the 2019 Festival include a limited seventeen-person crew that will start preparations at the Site on Sunday, August 4, 2019 to mark out camping locations and erect Festival fencing. The crew will increase to 22 persons on Friday, August 9 to begin construction of the stage at the Site. The crew size will increase to 31 persons on Sunday, August 11 for final preparations leading up to the time that the camping and parking gates open to the public at 10:00 a.m. on Thursday, August 15, which serves as the official start date of the Festival. The Festival will continue through Sunday evening, August 18<sup>th</sup>. Campers will vacate the Site by 10:00 a.m. on Monday morning, August 19<sup>th</sup>. A crew of approximately 48 persons will



start removal of the stage and Site clean-up on Monday morning, August 19<sup>th</sup> and continue daily work through Wednesday, August 21<sup>st</sup>. A smaller crew of 6 to 14 persons will provide final clean-up of the Site on Thursday with final completion on Friday, August 23, 2019.

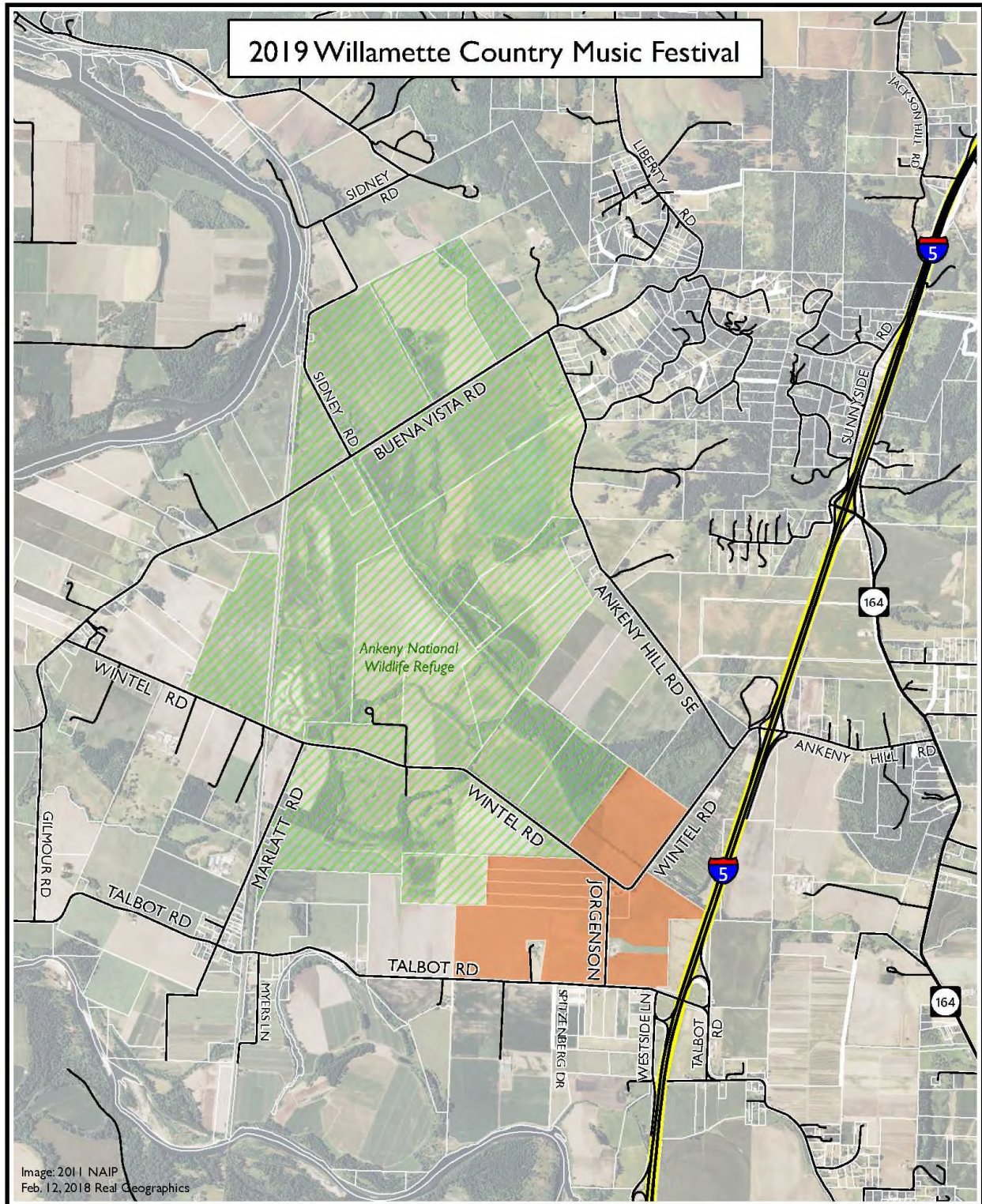


Figure 2. Site Location and Approximate Festival Boundaries





Figure 3. Preliminary Event Layout.



## APPROVAL CRITERIA

This section describes the potential applicable approval criteria for review and concurrence by affected agencies. The purpose is to ensure that all of the potentially applicable criteria relevant to the Festival are addressed within the Outdoor Mass Gathering permit application and, if necessary, any land use application(s). A scoping memorandum outlining these items was provided to Marion County and ODOT staff on January 26, 2018; both Marion County and ODOT confirmed that the approval criteria outlined below addressed agency requirements.

### Marion County Requirements

Marion County requirements were identified within the December 20, 2017 memorandum to the Marion County Hearings Officer, from Marion County Planning Division Planner Brandon Reich regarding Conditional Use 17-043/Gross. In addition to the items identified in the memorandum, Joe Bessman and Del Huntington met with Marion County Engineering staff, Julia Uravich and John Rasmussen, on December 27, 2017, to discuss details of the TIA. On January 4, 2018, a joint meeting to further discuss the scope of the TIA, included Julia Uravich from Marion County, ODOT staff, and Joe Bessman and Del Huntington.

Based on this correspondence and meetings, Marion County staff have identified the following TIA and Temporary Traffic Control Plan elements:

1. Vehicle queuing analysis on county roads during both peak and nonpeak traffic generation times;
2. Coordination with ODOT Region 2 and District 4 on impacts to the state highway system, including I-5 mainline, I-5 interchanges, and OR 99E;
3. Analysis of internal circulation and service operations at accesses providing entrance to parking and camping and a plan for the expedient processing of entering vehicles to minimize dwell times on county roads;
4. Impact to the local residents and businesses with identified mitigations;
5. Railroad crossing impacts and proposed mitigations;
6. Consideration and accommodation of Buena Vista Ferry operations;
7. Emergency services (EVA) provisions;
8. Review of the roads, bridges, and intersections identified for vehicle routing in the traffic plan;
9. Identify other roadway safety considerations to be addressed prior to the event;
10. Pedestrian routing and safety;
11. Traffic incident response and management;
12. Mass evacuation plan; and,
13. Identify management plan to prevent festival campers from using the Wildlife Refuge pullout spaces from overnight camping.

### ODOT Region 2/District 4 Traffic Control/Review

On December 1, 2017, Del Huntington attended an initial meeting with ODOT Region staff, Gerry Juster and Keith Blair. ODOT District 2 and District 4 staff joined the meeting via a conference call. The purpose of the meeting was to initiate a conversation for the WCMF and become aware of the ODOT interests associated with the proposed Festival. On January 4, 2018, a joint meeting to further discuss the scope of the TIA, included ODOT staff, Keith Blair, Casey Knecht and Gerry Juster, Marion County staff and Joe Bessman and Del Huntington. Below are items that were discussed:

- Operational analysis of the I-5 ramp terminals at Ankeny Hill Road and Talbot Road interchanges during both the peak and nonpeak traffic generation times for projected 2019 August traffic volumes for Thursday, Friday, Saturday and Sunday.
- Vehicle queuing analysis on the I-5 ramps during both peak and nonpeak traffic generation times for projected 2019 August traffic volumes for Thursday, Friday, Saturday and Sunday.
- Segment analysis for northbound and southbound portion of I-5 in the vicinity of the Site. Data from the closest Automated Traffic Recorder (ATR) will be used to identify existing Average Annual Daily Traffic Volumes and splits in the daily traffic flow. Traffic volumes will be adjusted to estimated volumes for 2019, and further adjusted to reflect typical August traffic volumes.
- Identification of an Emergency Access Route in the event that congestion or an incident occurs on an I-5 ramp, at a study I-5 ramp terminal or downstream on the County road system that results in a traffic queues onto the I-5 mainline.
- If the Emergency Access Route identifies an additional I-5 interchange, conduct operational analysis of the impacted I-5 ramp terminals and ramps, similar to ODOT items 1) and 2) above.
- Continue coordination with ODOT District 4 staff to ensure that the "Application and Permit to Occupy or Perform Operations upon a State Highway". The purpose of the permit is to allow for the temporary installation of Variable Message Signs along I-5 at locations north and south of the proposed Site.

### ODOT Rail Coordination

In a December 6, 2017 email from David Smith, ODOT Rail and Public Transit Division to Gerry Juster, ODOT, Mr. Smith expressed concerns with the potential of routing Festival traffic across four at-grade railroad crossings within the Site vicinity. Each of the crossings contain passive control with crossbucks and STOP signs, with advance warning signs.

### PUBLIC OUTREACH

The WCMF team initiated an outreach effort to respond to comments, concerns, and issues from the surrounding area. Initial information efforts included outreach to concerned residents, business owners and the farming community in the Talbot-Jefferson area at a "town hall" meeting held at the Jefferson Fire Hall on Friday evening, December 1, 2017. While several residents from the area attended the "town hall" meeting, both Mr. Hilton of Hilton Trenching and Mr. Jensen of Neils Jensen Farms provided the team with specific information related to their business and farming practices. This information, combined with other data and understanding of business and farming operations has been used to develop and refine traffic mitigation strategies for the proposed Festival.

On January 19, 2018, Del Huntington sent nine separate letters to those who expressed concerns with the Festival in an October 26, 2017 letter to Marion County. The purpose of the nine letters was to request an individual meeting with each business/farming operation at their desired location and time to better understand their individual business and/or farming practices, specific fields that they farm, approximate harvest season, days and hours of operation, and the number of employees and equipment used in their operation. Individual letters were not sent to two parties that were included in the October 26, 2017 letter to Marion County as they are represented by legal counsel. The WCMF legal counsel reached out to the opposition legal counsel that represented the other two parties at the December 20, 2017 hearing and again on three separate occasions via email to request a meeting without a positive response.

Two of the parties that we reached out to initially agreed to meet then subsequently cancelled. Three parties from the group elected to meet, which included meetings with Santiam Farms on January 25, 2018, Hilton Trenching on February 1, 2018 and Dejager Dairy Farms on February 12, 2018. These meetings

provided specific information related to their business and farming practices. This information proved helpful in developing mitigation strategies to reduce potential traffic impacts to their operations.

It is understood that Santiam Farms operations includes approximately 600 acres near Independence and 600 acres in the Talbot area. Hay and seed are grown and harvested on the north side of Buena Vista Road, south of Sidney Road. Beets, Radish and Spinach fields are in the area generally west of Gilmor Road, on the north and south sides of Talbot Road. During harvest season employees work from early morning until dark or even through the night when harvesting green beans. Product is hauled to processing plants in Stayton, Brooks, Independence and Salem. As Santiam Farms operations occur in the Talbot vicinity and Independence, they use Buena Vista Road, the Buena Vista Ferry and Sidney road to move employees and equipment between the various farming operations.

Mr. Brian Krebs, President of Santiam Farms, emphasized that they own their own equipment, including two combines, tractors and various farming equipment that must be moved from field to field as crops are ready to harvest. Harvesting season begins in July and continues through September for the various crops. Santiam farms typically use the Buena Vista ferry to move combines from one side of the Santiam River to the other, though there are times that the ferry is shut down due to a dredging operation in the river or low water levels that prevent ferry operations. In this event, combines travel Riverside Drive, Sidney Road and Buena Vista Road. They coordinate with a land owner near the railroad overcrossing on Riverside Drive who allows them to use cross on the property as the combines are too tall to be driven under the railroad structure. If the combines are held up on a crop, it impacts the dates that future crops can be harvested.

For an overview on Talbot Trenching, refer to the *Business Activity* section of this report.

Generally, during this time of year, one milk truck arrives to Dejager Dairy Farms to pick up and transport milk every other day during the morning. In addition, Dejager Dairy Farms grow corn in a field immediately west of the proposed Festival site, and a sorghum field immediately to the west and north of the corn field. The crops are used for silage, with 10-wheelers (dump trucks) hauling product on Wintel Road to the dairy farm every 5 to 6 minutes during harvest. Sorghum is typically harvested in August over two-three days and corn is harvested in September. The Farms also grow clover in the northeast corner of Buena Vista Road and Wintel Road, as well as near the farm located along Wintel Road and Marlatt Road.

Additional emails, phone messages and/or letters were sent to Gilmor Farms, Oregon Dairy Association, Marion County Farm Bureau, Oregon Mint Commission, National Frozen Foods, Universal Seed, Lakeside Ag., and NORPAC requesting meetings to learn more about the farming operations in which they participate.

Representatives from National Frozen Foods in Albany and NORPAC in Stayton agreed to meet and provided insight into their specific food processing requirements. National Frozen Foods has their own crop harvesters and trucks and based on the size of the field to be harvested, is able to send a fleet of machinery to the farmers field and harvest the crop in 12 to 16 hours. (See more on the National Frozen Food process under the section "Green Beans" within the *Area Agricultural Crops* section of this report). NORPAC manages their operations quite differently than National Frozen Foods as NORPAC does not have their own harvesters. Rather, NORPAC coordinates with each farmer individually, and the planting/harvesting time is spread over a much wider window on the growing calendar. The farming operation is required to have its own harvesting equipment (or access to the equipment). Farmers are likely to plant a series of smaller acreages of crops over many weeks, which results in the crop reaching maturity at staggered intervals. This allows the farming operation with limited equipment, the ability to harvest their crops over successive weeks. Several of the farmers in the Talbot/Jefferson area haul their crops to the NORPAC processing plant in Brooks or Stayton.



Phone conversations with representatives of Universal Seed in Independence, and Lakeside Ag., in Albany also provided insight into farming and harvesting practices in the Talbot-Jefferson area.

## AREA AGRICULTURAL ACTIVITIES

Based on testimony submitted to Marion County Planning staff, and in meetings with local farmers and residents, the major crop in the area is Grass Seed. Additional agricultural activities in the area include Straw for export, Custom Straw Baling, Wheat, Rye Grass, Clover, Sorghum, Corn, Hazelnuts, Peppermint, and Vegetables including; Green Beans, Spinach, Radish and Sugar Beets. Other farming activities in the area include Dairy Farming.

Farming operations consist of employees arriving and departing from work each day, moving farm equipment, trucks and personnel to various fields to prepare fields for planting, irrigation, monitoring crop production, pest and weed control, cultivation, harvesting of crops and the transportation of product to market. Farming activities are often dictated by the weather, and at times, require farmers to operate their crews and equipment 24 hours a day, especially during certain harvest times.

Some farmers in the area own and/or farm other areas in the valley such as Independence, east of I-5, east of Jefferson, east of the Santiam River and Albany. These farmers typically move the tractors, combines, mowers and other related farming equipment, trucks and employees to various fields and locations as crops dictate.

### Area Crops

Based on information compiled by the team through public outreach efforts with farmers and local food processors, a description of area crops and their relevance to the August festival are summarized below.

#### Grass Seed

The Festival, camping, and associated vehicle parking will be held on approximately 440 acres of land farmed for Grass Seed, the major crop in this area. Harvesting of Grass Seed is typically completed by the end of July each year. Therefore, the mid-August 2019 Festival and associated traffic will not interfere with the grass seed harvest and tractors/trucks and combines that harvest the grass seed.

Several types of grass seed are grown in the Festival vicinity, with the first crop, Annual Rye Grass, usually harvested near the end of June. The second crop is Tall Fescue, harvested in the first part of July, immediately after the Annual Rye Grass, then Perennial Rye Grass, harvested in mid-July. The grass is windrowed (cut) and laid in rows to dry for 7 to 10 days, then a fleet of combines transfer the seed to trucks to haul the product away. Rakes then move the remaining grass into rows for the balers to bale and place in stack wagons for semi-trucks to haul off of the fields. The entire process from the time the first crop is cut until the crop is baled and hauled away lasts from the end of June until the first week of August. Rain may occasionally result in the process extending into the second week of August.

### Custom Straw Baling

It is understood that there is a limited amount of custom straw and custom straw baling in this area, with the majority of the activity located to the west of Talbot and Buena Vista Road. Straw is typically cut in a similar manner as described above and completed by early August.

### Wheat

It is understood that there is a very limited number of acres of wheat farming in this area as the price of wheat has fallen in recent years. Combining of wheat requires the farmer to changing over the combine, so it is limited activity to one or two combines rather than a large fleet. The harvest is typically in mid-August.

### Bent Grass

It is understood that there is a limited amount of Bent Grass farming in this area. The harvesting and baling of Bent Grass is like the other grass seed farming the area, though Bent Grass is usually harvested near the end of August. It is then windrowed and baled and hauled away with semi-trucks.

### Clover

It is understood that there is a limited amount of clover farming in this area, with most of the activity located near Marlatt Road and Wintel Road. Clover is grown for seed and silage. Clover is typically cut in late August and lays on the field for a week, then combined and windrowed and hauled by truck. It takes approximately three days to harvest the clover and commences around 11:00 a.m. each morning (after the dew has dried) and ends before dark. Once the clover is cut, it is critical that the clover is harvested before any rainfall.

### Sorghum

There is a limited amount of Sorghum farming in this area which is used for silage, with most of the activity located just to the north and west of the proposed Festival. Typically, there is a two- to three-day window in mid-August when sorghum is ready for harvest. Sorghum is cut one day then harvested the next with a self-propelled chopper. The chopper transfers the product into waiting 10-wheel dump trucks. The trucks then access onto Wintel Road and haul the product west on Wintel Road to the Dejager Dairy Farm. It is typical to have a truck entering Wintel Road from the field every 5-6 minutes, approximately 12 loads per hour, to and from the site. The harvest is a daytime operation and it takes two- to three-days to complete the harvest.

The chopper used in the harvesting is 10 feet wide and when traveling on the county road, requires on-coming motorists to slow as both vehicles need to shift towards the shoulder as they meet and pass each other to increase clearance.

### Corn

There is a corn field immediately adjacent to the proposed Festival site on the north side of Wintel Road. The corn is grown for silage and hauled to the Dejager Dairy Farm on Wintel Road, and operations are like the harvesting of sorghum though the process is faster. Corn is not cut down one day before harvesting commences, rather, the chopper picks and chops the corn and transfers the product into a truck. The harvesting goes quickly, therefore there are more trucks on the road than with Sorghum. Harvesting of

corn typically occurs within a two- to three-day window in September though it can be ready for harvest earlier, depending on the weather.

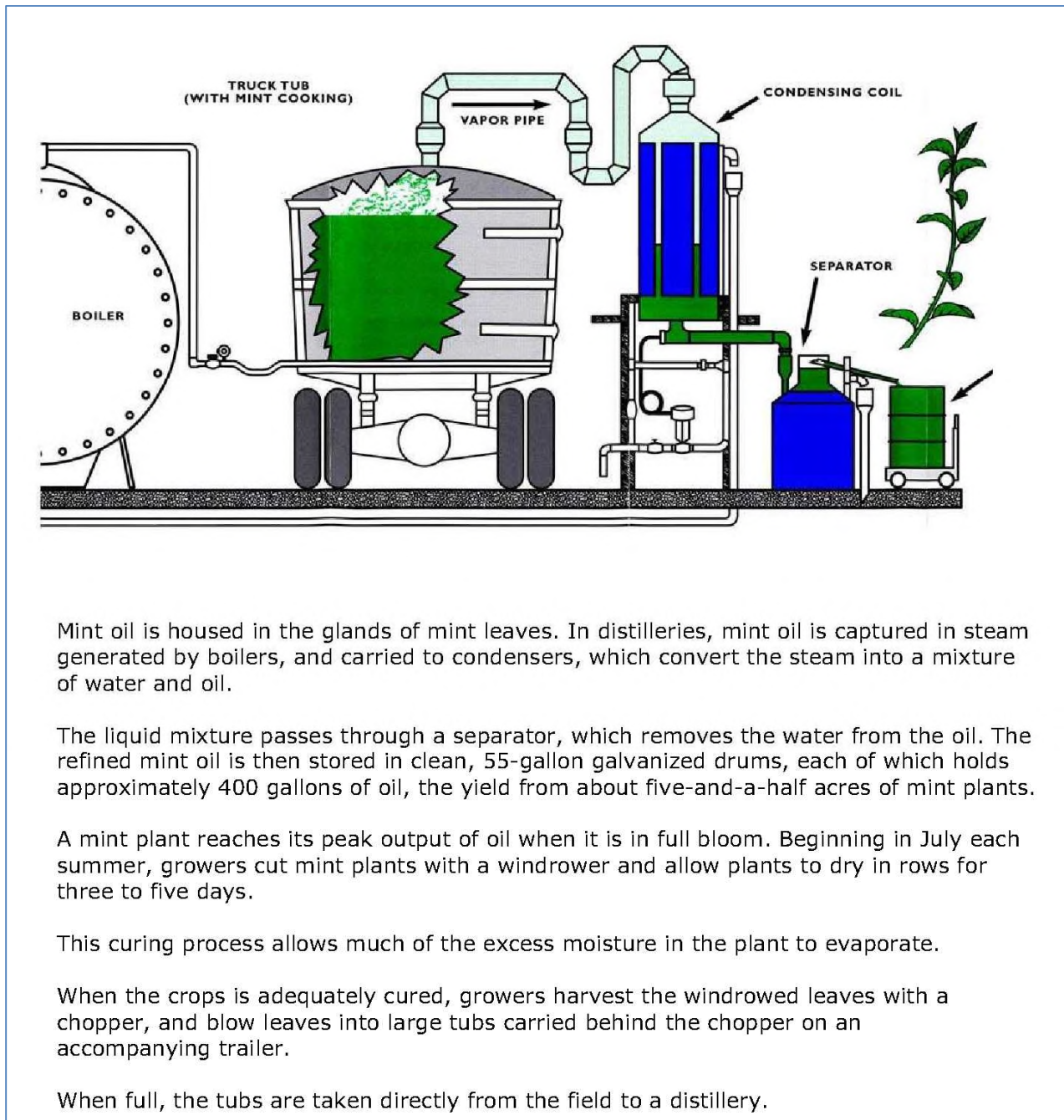
#### Hazelnuts

It is understood that there is a limited amount of Hazelnut farming in this area, with the majority of the activity located near Independence. Hazelnuts are often harvested in September when the fruit falls to the ground. Mature trees do not typically require a great amount of maintenance during the summer months, though a newly planted orchard may require frequent irrigation during the hot summer months.

#### Peppermint

Based on a review of the Oregon Mint Association web site and discussions with knowledgeable farmers in the Jefferson – Talbot area, it is understood that there is a limited amount of mint farming area near the Festival on the west side of I-5, with larger mint fields on the east side of I-5. Mint is often cut with tractors/mowers in July and lays on the field for 3 to 5 days to dry. Once dried, harvesters pick up the mint, and transfer the product into 10-wheeler trucks to be hauled on Talbot Road, to a distillery east of Jefferson. The mint harvesting season is typically from late July and early August. Figure 4 from the Oregon Mint Commission provides details on the harvesting of local mint.





Mint oil is housed in the glands of mint leaves. In distilleries, mint oil is captured in steam generated by boilers, and carried to condensers, which convert the steam into a mixture of water and oil.

The liquid mixture passes through a separator, which removes the water from the oil. The refined mint oil is then stored in clean, 55-gallon galvanized drums, each of which holds approximately 400 gallons of oil, the yield from about five-and-a-half acres of mint plants.

A mint plant reaches its peak output of oil when it is in full bloom. Beginning in July each summer, growers cut mint plants with a windrower and allow plants to dry in rows for three to five days.

This curing process allows much of the excess moisture in the plant to evaporate.

When the crops is adequately cured, growers harvest the windrowed leaves with a chopper, and blow leaves into large tubs carried behind the chopper on an accompanying trailer.

When full, the tubs are taken directly from the field to a distillery.

Figure 4. Mint Harvesting Information from *Oregon Mint Commission*

## Green Beans

Based on a meeting with National Frozen Foods General Manager and Field Shop Manager in Albany, it is understood that:

- National operates 24 hours a day during the harvest season, July through the end of October and their trucks haul to the processing plant around the clock during these months.
- In the Jefferson area, they harvest green beans and corn. There are several fields on the east side of Jefferson and fields near Talbot.
- Much of the truck traffic is on the Interstate or the quickest route available from the field to the processing plant.
- The harvesters travel on county roads and state highways. They are not allowed on the Interstate.

- During the harvest season green beans and corn are hauled from throughout the Willamette Valley to Albany. They utilize extended length dump trucks and tractors with 53-foot trailers to haul the produce. It is unknown how many acres of green beans are (or will be planted) within the Jefferson/Talbot area.
- They own and operate 13 green bean pickers/harvesters. The harvesters are 14 feet wide, with a top speed of 25 mph. At a minimum, they travel in pairs or may include any additional harvesters and at times, may have all 13 machines in a row. They employ a pilot vehicle before and after when they operate on public roads. As travel lanes are often 11- to 12-feet wide, they encroach into the adjacent travel lane, especially if the roadway lacks shoulders. It is unknown how many of the harvesters will be within the Jefferson/Talbot area during the festival period.
- When the field is ready for harvesting, National has a 3- to 5-day window to harvest the crop and haul to Albany. The timeline is determined by the weather; i.e., if the temperature is in the 90's or over 100 degrees, they only have three days to harvest the crop.
- Fields are often picked in 12 to 16 hours of non-stop labor.
- The pickers/harvesters pick the crop, which is transferred to a bin on the back of the machine, then transferred/dumped into a truck. At a minimum, they fill a truck every hour, though based on the size of the field and number of harvesters, they may fill 2.5 trucks each hour.
- As soon as the field is harvested, they move the harvesters to the next field that is ready for harvesting.
- They own and operate 3 corn pickers/harvesters. The machines are 16' wide, with a top speed of 25 mph. They employ a pilot vehicle before and after when they operate on public roads. As travel lanes are often 11 feet to 12 feet wide, they encroach into the adjacent travel lane, especially if the roadway lacks shoulders.
- Common travel routes for the harvesters used in the Talbot- Jefferson vicinity include Talbot Road, both east and west of I-5, Buena Vista Road, south to the ferry and north to Liberty Road.
- National coordinates with their growers to determine an approximate planting and harvesting times based on the growing season in a particular area, growing time, and soils.

### Sugar Beets

Based on a meeting with Mr. Krebs, President of Santiam Farms, and in a conversation with representatives from Lakeside Ag., in Albany, it is understood that:

- Sugar beets are grown for seed, with the harvest often occurring in September. The window to harvest sugar beets is typically 3-5 days, though weather often dictates when the crop is to be harvested.
- The sugar beets are cut with a swatter, and the crop lays on the field for approximately a week to dry.
- Once the crop is dry, combines pick up the crop and transfer the product into trucks and hauled to the food processor in Independence.
- Harvesting is usually conducted during daylight hours, or until approximately 9 p.m. and may occur over 2-3 days or a week, depending on the amount of acreage planted with sugar beets.

## Spinach

Based on a conversation with Universal Seeds representatives in Independence, it is understood that:

- Spinach is grown for seed, generally west of Talbot, along Talbot Road and Buena Vista Road.
- Farmers use their own equipment, and typically swath, then allow the crop to lay on the field for a week prior to harvesting.
- Harvest of spinach seed is a daytime operation, usually the end of July into the first week of August.
- A combine is used to pick up the seed and transfer to a truck to haul the product.
- They typically harvest one belly-dump truck each day, which represents approximately 20 acres of spinach. The trucks haul directly to I-5, then to Independence, via Albany or Salem.
- The total number of days to harvest depends on the total number of acres planted in spinach (one day for every 20 acres)
- Once harvesting is complete, the field is usually left until it rains. The farmer will likely disc the field to chop unwanted weeds of the remainder of the crop.

## Radish

Based on a conversation with Universal Seeds representatives in Independence, it is understood that:

- Radish is grown for seed, generally west of Talbot, along Talbot Road and Buena Vista Road.
- Farmers use their own equipment, and typically swath, then allow the crop to lay on the field for a week prior to harvesting.
- Harvest of radish seed is a daytime operation, usually the last week of August into the first week of September.
- A combine is used to pick up the seed and transfer to a truck to haul the product.
- They typically harvest one belly-dump truck each day, which represents approximately 40 acres of radish. The trucks haul directly to I-5, then to Independence, via Albany or Salem.
- The total number of days to harvest depends on the total number of acres planted in radish (one day for every 40 acres)
- Once harvesting is complete, the field is usually left until it rains. The farmer will likely disc the field to chop unwanted weeds or the remainder of the crop.

## BUSINESS ACTIVITY

The project team was made aware of three existing business activities in the area that include Agricultural Product Storage, Farm Trenching and Drainage, and a Nursery.

Based on input from Mr. Hilton of Hilton Trenching and testimony submitted to Marion County Planning staff, it is understood that business activities include the arrival and departure of 5 to 6 employees each work day, hauling of equipment and product to and from business locations, and serving customers that arrive at the business locations. While Hilton Trenching employs a very large machine for trenching and installing drain piping in fields throughout the valley, this piece of oversized machinery is moved out in the spring and returned to the place of business on Talbot Road in the fall. Other machinery and equipment that is moved daily for Hilton Trenching and the other area businesses are typical tractor/trailers and not likely over-length or over-width, thus able to travel within the given travel lane.



## BIKEWAYS

There is a considerable amount of cycling that occurs on the county roads during the summer months in the vicinity of the proposed Festival. As the roads do not have paved shoulders, cyclists ride on the travel lanes and share the roadway with other vehicle modes. A review of the Marion County data for cyclists crossing the Santiam River on the Buena Vista ferry during the month of August 2017 identified the following;

- Thursdays: ridership varied from one to 8 cyclists over the course of the entire day
- Fridays: ridership varied from 6 to 10 cyclists over the course of the entire day
- Saturdays: ridership during the month experienced 382 cyclists on August 5, with 330 cyclists using the ferry between 9:00 a.m. and 2:00 p.m. (likely part of a cycling event), 18 cyclists on August 12, 34 cyclists on August 19, and 29 cyclists on August 26.
- Sundays: ridership during the month experienced 27 cyclists on August 6, 37 cyclists on August 13, 147 cyclists on August 20, with 134 cyclists using the ferry between 9:00 a.m. and 5:00 p.m., and 93 cyclists on August 27, with 84 cyclists using the ferry between 9:00 a.m. and 2:00 p.m.

Several of the roads in the vicinity of the proposed Festival are also part of the Oregon Scenic Bikeways. The Oregon State Parks has developed a series of Oregon Scenic Bikeways across the state that include state highways, county roads, city streets and bike paths. One of the routes is the Willamette Scenic Bikeway, which is a 135-mile designated bike route that connects Champoeg State Park south of Wilsonville to Armitage County Park near Eugene. The Salem to Albany portion of the route includes River Road to Riverside Drive, Sidney Road, then south on Buena Vista Road, south to Talbot Road, then east on Talbot Road and across I-5 to Jefferson Highway. *See Figure 5 for the Oregon Willamette Scenic Bikeway route.*

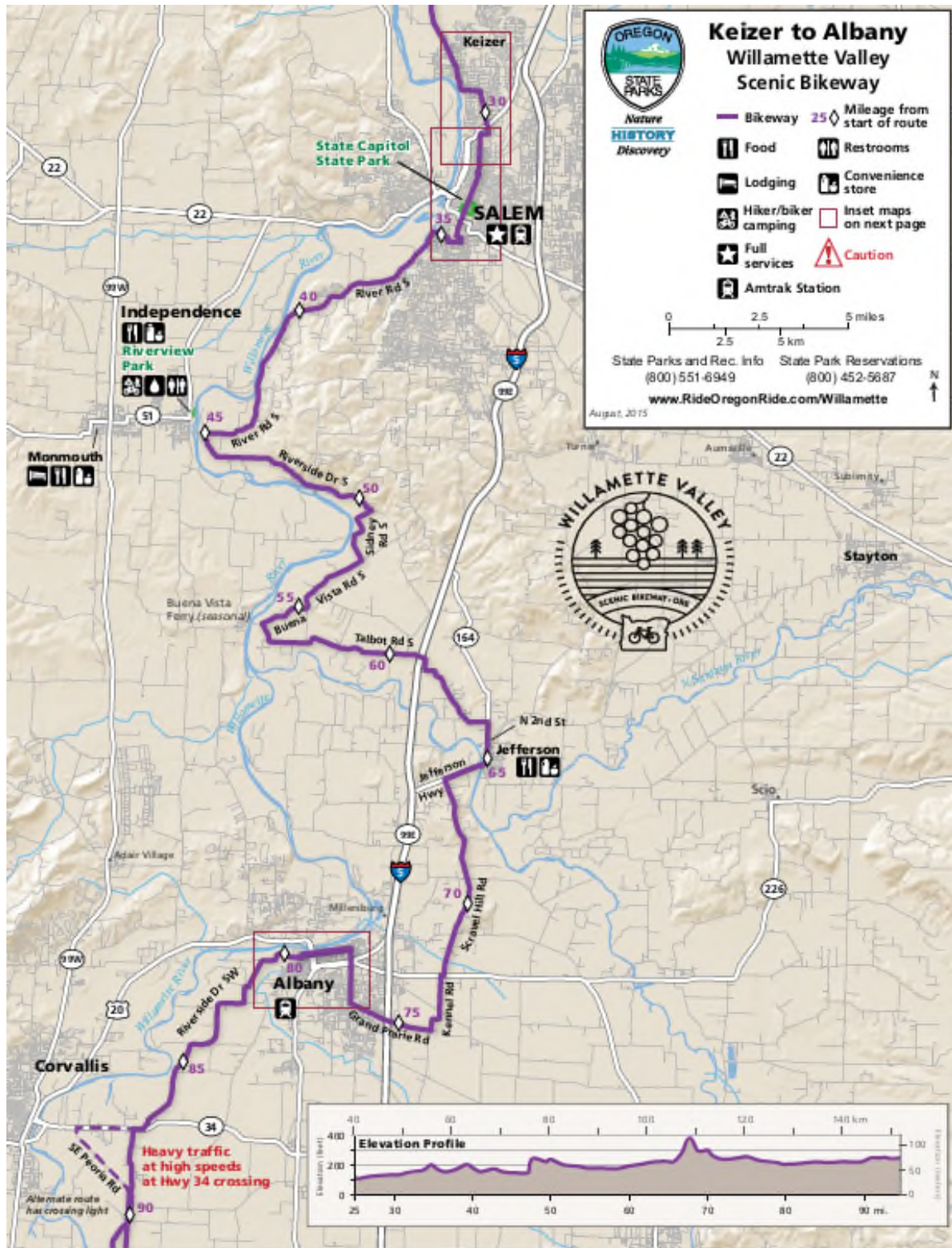


Figure 5. Oregon Willamette Scenic Bikeway Route.

## WILDLIFE REFUGE AREAS

The Ankeny Wildlife Refuge is a resource under the management of the United States Department of the Interior, U.S. Fish and Wildlife Service, and part of the Willamette Valley National Wildlife Refuge Complex.

The Ankeny Wildlife Refuge area was previously known as "Ankeny Bottoms" and was selected as a refuge site to provide overwintering habitat for the dusky Canada goose and many other species of migratory waterfowl. Multiple amphibians, black tailed deer, and some elk also utilize this sanctuary.

Concerns expressed within the public comments include additional stress due to increased vehicles on the perimeter of the refuge, additional conflicts with wildlife, and headlight impacts into the refuge. In addition, concerns were raised by the County of the propensity for festival users to park within the pull-outs to avoid typical fees for overnight camping. Figures 6 and 7 illustrate existing pull-outs and signage.

In a phone conversation with Mr. Graham Evans-Peters, Refuge Manager on February 6, 2019, it is understood that a U.S. Fish and Wildlife Service Law Enforcement Officer monitors the refuge to ensure that refuge rules are followed and that no one parks in the refuge pull-outs between dusk and dawn each night. Mr. Evans-Peters stated that additional law enforcement officers may be required to provide surveillance and monitor the area during the proposed 2019 Festival.



Figure 6. Typical wildlife refuge pull-out and viewing area.





Figure 7. Existing posted parking restrictions.

## EXISTING TRANSPORTATION INFRASTRUCTURE

This section of the report describes the existing transportation infrastructure surrounding the proposed festival site. The purpose of this section is to understand current opportunities and constraints within the study area.

### TRANSPORTATION SYSTEM OVERVIEW

The surrounding area is bordered to the south and west by the Willamette River, to the east by the access-controlled I-5 corridor, and to the north by the Ankeny National Wildlife Refuge. There are limited access options into and within the surrounding area, which is largely defined by large-lot agricultural parcels. Outside of the interstate system the roads are all under the jurisdiction of Marion County. These low-volume rural roads typically experience a summer daily traffic volume of 400 to 800 vehicles, and also cater to cyclists as part of a designated Oregon Scenic Bikeway. The roads are generally narrow two-lane facilities with no paved shoulders and a 45 to 55 mph rural travel speed.

Other significant transportation infrastructure includes the Portland and Western railway that traverses the area along a north-south alignment and the Buena Vista Ferry that provides the area's only Willamette River crossing toward the west, serving local residents and reducing the travel distance for agricultural equipment. Figure 8 depicts the area roadways in the project vicinity in addition to the Buena Vista Ferry and railroad crossings.



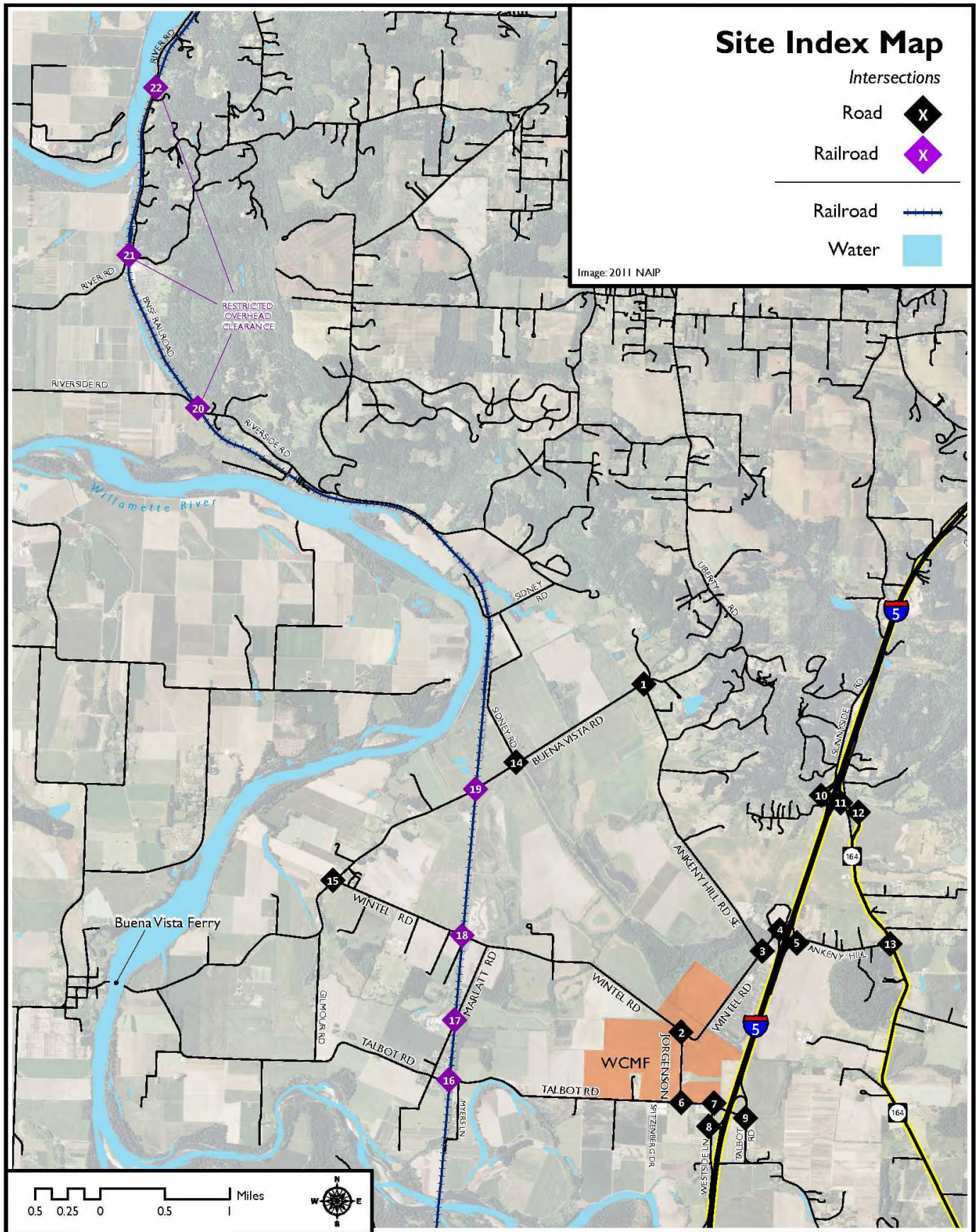


Figure 8. Site Index Map



## Public County Roads

There are several public Marion County roads that traverse the study area. Major area roadways and their characteristics are summarized below in Table 1.

**Table 1. Marion County Roads**

Roadway	Functional Classification	Cross Section <sup>1</sup>		Roadway Constraints
		Travel Lanes	Shoulder	
Ankeny Hill Rd	Minor Collector	20'	2' both sides <sup>2</sup>	
Talbot Rd	Major Collector	18-21'	1 to 4' both sides <sup>3</sup>	
Wintel Rd	Local	19-20'	3' both sides <sup>2</sup>	
Jorgenson Rd	Local	20'	2' both sides <sup>2</sup>	
Buena Vista Rd	Major/Minor Collector <sup>4</sup>	19-20'	1 to 3' both sides <sup>2</sup>	
Marlatt Rd	Local	20'	4' both sides <sup>2</sup>	
Liberty Rd	Minor Collector	18'	2 to 3' both sides <sup>2</sup>	
Sidney Rd	Minor Collector	20'	1' to 5' both sides <sup>2</sup>	
Riverside Dr	Minor Collector	19'	1' both sides <sup>2</sup>	Vehicle height restriction of 10'11" at railroad overpass
River Rd	Arterial	28'	3' both sides <sup>5</sup>	Vehicle height restriction of 12'3" and 12'9" at two railroad overpasses

<sup>1</sup> Information from the Marion County Rural Transportation System Plan

<sup>2</sup>Gravel shoulder

<sup>3</sup>Gravel shoulder from Buena Vista Rd to I-5 overcrossing. Asphalt shoulder from I-5 overcrossing to Jefferson Hwy.

<sup>4</sup> Minor Collector from Liberty Rd to Talbot Rd. Major Collector from Talbot Rd to Buena Vista Ferry.

<sup>5</sup>Asphalt shoulder

There are numerous constraints that were identified along these area roadways based on both horizontal and vertical clearance. These dimensional constraints will be critical as the proposed festival caters to both day-use and campers, so the recommended access routes should be clearly marked to prevent vehicles from being forced to make U-turns due to dimensional constraints. Photos of area constraints are provided in Figures 9 to 15 and correspond to the numbered crossings in Figure 8.



Figure 9. Southbound View on Riverside Drive (See 20 in Figure 8)



Figure 10. Railroad Overcrossing Structure on Riverside Drive – Southbound View (See 20 in Figure 8)



Figure 11. Eastbound View on River Rd





Figure 12. Northeastbound View on River Rd in Advance of Railroad Overcrossing (See 21 in Figure 8)



Figure 13. Railroad Overcrossing Structure on River Rd - Northeastbound View (See 21 in Figure 8)



Figure 14. Northeastbound View on River Rd in Advance of Railroad Overcrossing (See 22 on Figure 8)



Figure 15. Railroad Overcrossing Structure on River Rd - Northeastbound View (See 22 on Figure 8)



## State Highways

There are two primary State highways within the event vicinity. This includes the Interstate 5 corridor and Highway 99E through Jefferson. Both of these facilities are within the jurisdiction of ODOT and require coordination for the placement of any type of temporary traffic control devices. Table 2 summarizes the characteristics of these facilities.

**Table 2. Oregon Department of Transportation Facilities**

Roadway	Functional Classification	Cross Section	Posted Speed
Interstate 5 (I-5)	Interstate	4 lanes	65 mph
Jefferson Highway #164	District Highway (OHP)/ Rural Minor Arterial (NHS)	2 lanes	55 mph (in rural areas)

## Buena Vista Ferry

The Buena Vista Ferry provides the only crossing of the Willamette River within the study area. Based on data from August 2017, the Ferry carries an average of 140 vehicles per day in the peak summer months, including approximately 12 vehicles per hour. The Buena Vista ferry operates when the river level reaches 15 feet and provides ferry service seven days a week between 7:00 a.m. and 7:00 p.m. throughout the year



Figure 16. Buena Vista Ferry

(and will not be available for attendees leaving the event in the evenings). The ferry is capable of carrying vehicles up to 60 feet long and weighing up to 40 tons, with costs varying based on the vehicle length and weight. Pedestrians can use the ferry for free, and cyclists are charged a nominal \$1.00 fee. Typical passenger vehicles cost \$3.00, ranging up to \$18.00 for vehicles that utilize the entire ferry.

A round trip takes 10 to 12 minutes on average, resulting in a maximum capacity of 60 vehicles each direction per hour. This number is reduced if there are large vehicles, such as trucks or tractors using the ferry during this time. A photo of the Buena Vista Ferry is shown in Figure 16 and the location of the crossing is identified in Figure 8.

## Pacific and Western Railway

The Pacific and Western (PNWR) railway bisects the study area with a north-south alignment. There are four at-grade railroad crossings of the PNWR rail line in the site vicinity located approximately two miles west of the site.

There are four at-grade railroad crossings of the Portland and Western (PNWR) rail line in the project vicinity, approximately 2 miles to the west of the proposed venue. These crossings are:

- Buena Vista Rd S (USDOT 067081P / Oregon Crossing No. 3E-85.7)
- Wintel Road (067083D / 3E-86.8)
- Marlatt Road (067084K / 3E-87.5)
- Talbot Road (067085S / 3E-87.9)

These crossings are pictured below in Figures 18 to 33.

It is anticipated that all traffic associated with the set-up prior to the Festival and take-down following the Festival will arrive and depart the Site via the most direct connection (I-5) and will not require crossing the PNWR. Accordingly, implementation of any identified traffic control measures at the crossings will be initiated with the start of the Festival. We will continue our coordination with ODOT Rail Division.

In a conversation with PNWR staff on February 5, 2018, the railroad company declined to provide schedules or information on the rail lines due to federal regulations. However, based on field observations and in conversations with nearby residents, there are typically three trains each day that haul freight, with the schedule and frequency based on demand.

A 24-car freight train was observed at one of the PNWR crossing on February 12, 2018, traveling at approximately 25 mph. The train was comprised of two engines, with two empty boxcars and 22 empty flat cars. The condition of the track/rail suggests that trains are required to travel at slow speeds.



Figure 17. Example of A Typical Freight Train at a PNWR Crossing

The proposed travel routes to the Festival for motorists arriving from Independence (via Sidney Road) and Salem (via Liberty Road) will result in southbound motorists crossing PNWR No. 3E-85.7, and eastbound on Wintel Road at PNWR No. 3E-86.8 during daylight hours. Attendees leaving the Festival for Salem and



Independence will be routed onto Ankeny Hill Road to Liberty Road and Sidney Road and therefore will not cross either PNWR at-grade R/R crossing.

As PNWR have declined to provide a train schedule for each day of the Festival, out of an abundance of caution it is proposed that supplemental red or orange flags be added to the existing STOP signs on Buena Vista Road and Wintel Road to make motorists more aware of the at-grade railroad crossings. No traffic to or from the Festival will be routed to the PNWR at-grade crossings on Talbot Road or Marlatt Road to avoid routing event attendees over the most skewed railroad crossings.



Figure 18. Buena Vista Rd S at USDOT 067081P/Oregon Crossing No. 3E-85.7 (See 19 in Figure 8)





Figure 19. SB on Buena Vista Approaching Crossing 3E-85.7 (See 19 in Figure 8)



Figure 20. SB on Buena Vista Crossing 3E-85.7 Looking left (See 19 in Figure 8)





Figure 21. SB on Buena Vista Crossing 3E-85.7 Looking right (See 19 in Figure 8)



Figure 22. Wintel Road at 067083D / 3E-86.8 (See 18 in Figure 8)





Figure 23. EB on Wintel Road Approaching Crossing 3E-86.8 (See 18 in Figure 8)



Figure 24. EB on Wintel Road Crossing 3E-86.8 Looking left (See 18 in Figure 8)





Figure 25. EB on Wintel Road Crossing 3E-86.8 Looking right (See 18 in Figure 8)



Figure 26. Marlatt Road at USDOT 067084K /Oregon Crossing No. 3E-87.5 (See 17 in Figure 8)





Figure 27. NB on Marlatt Road Approaching Crossing 3E-87.5 (See 17 in Figure 8)



Figure 28. NB on Marlatt Road Crossing 3E-87.5 Looking left (See 17 in Figure 8)





Figure 29. NB on Marlatt Road Crossing 3E-87.5 Looking right through the rear window of the vehicle (See 17 in Figure 8)



Figure 30. Talbot Road at USDOT 0670855 /Oregon Crossing No. 3E-87.9 (See 16 in Figure 8)





Figure 31. WB on Talbot Road Approaching Crossing 3E-87.9 (See 16 in Figure 8)



Figure 32. WB on Talbot Road Crossing 3E-87.9 Looking left (See 16 in Figure 8)





Figure 33. WB on Talbot Road Crossing 3E-87.9 Looking right (See 16 in Figure 8)

## TRANSPORTATION ANALYSIS

This section of the report summarizes the transportation analysis conducted to identify the adequacy of the surrounding roadways and transportation infrastructure to accommodate the WCMF. The analysis includes an assessment of the I-5 system, County roadways, intersections, and event accesses. The focus of the analysis is to identify access routes to the site that will minimize conflicts with existing traffic or multiple arrival routes, and to separate pedestrian and vehicle traffic within the event venue to the extent possible.

### FESTIVAL TRAFFIC ANALYSIS PROCESS

The project analysis framework is based on the Federal Highway Administration's (FHWA) publication *Managing Travel for Special Events*. Unlike the unforeseen conditions associated with traffic crashes or weather incidents, planned events allow agencies to prepare with an understanding of the specific event location, time, and operating characteristics. This is particularly the case with the Willamette Country Music Festival given the historical information and data available from prior and the upcoming 2018 Brownsville Festival.

Figure 34 was adapted from the FHWA process and details the deliverables prepared within each step of the analysis process and illustrates that the ultimate outcome is the preparation of a Transportation Management/Traffic Control Plan.

As described within the process, the analysis of conditions first occurs based on the existing transportation system without mitigation plans or measures in place. The purpose of this approach is to highlight the areas that the mitigation measures (Transportation Management/Traffic Control Plan) must prioritize.

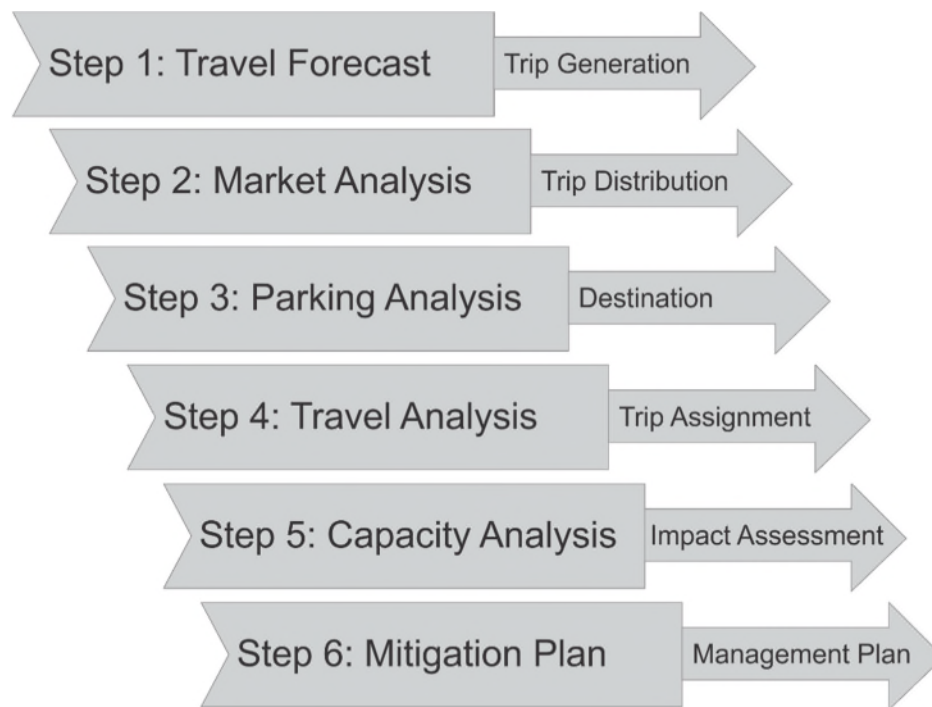


Figure 34. Six-Step feasibility analysis process. Adapted from FHWA Feasibility Analysis Steps.

## STEP 1: TRAVEL FORECAST

The purpose of the travel forecast is to identify how many vehicles the Festival will generate, and to prepare a profile of the arrival rates of event patrons. This assessment is prepared based on an assumed event attendance of 30,000 persons. There are three elements of the travel forecast step:

- **Modal Split:** Based on the rural location, the primary travel mode will be via personal automobile. Shuttle services to the Festival were previously provided at the Brownsville site, but had very low utilization and were subsequently discontinued. For analysis purposes it will be assumed that all trips occur by automobile, with no reductions applied for other travel modes.
- **Festival Traffic Generation:** This step identifies the number of personal automobiles arriving at the Site. This includes day use attendees, camping, volunteers, organizers, vendors, and performers. This step is influenced by vehicle occupancy, which is also influenced by parking pricing. Additional discussion of this step is provided below.
- **Traffic Arrival Rate:** This step separates the attendees by arrival time throughout the Festival duration. This includes setup personnel, arrival of campers, day use attendees, and the daily travel fluctuations until the departure of the campers on Monday by 10:00 a.m. following the completion of the event. Additional data and discussion is provided below.

### Festival Traffic Generation (Person Trips)

Within this step the key outcome is to identify the total number of persons present at the Festival across all categories, including Festival day-use attendees, campers, support staff, performers, vendors, and management. Each of these user types is defined below.

- **Day-Use Attendees:** This includes all those purchasing tickets to attend the Festival on a daily or multi-day basis but not staying overnight. This includes categories such as general admission (GA), premium general admission (PGA), and VIP seating.
- **Overnight Attendees:** This includes all those purchasing tickets to attend the Festival and staying overnight within any type of campsite (group, tent, RV, or “Glamping”).
- **Support Staff:** This category includes staff that are responsible for managing the Festival. This includes traffic and parking control, aid station, ticketing and money exchange personnel, trash collection, Festival hygiene services, lost and found, impound lot, emergency services staff, stage crews, audio/video crews, and security.
- **Performers:** Included in this category are the musicians and bands and all associated support staff.
- **Volunteers/Vendors:** This category includes food and concession sales that are within the Festival premises. Also included are volunteer organizations (local school districts, civic/service clubs, and informational booths).
- **Management:** Included within this category are the Festival organizers, Festival control stations, and other types of on-site coordination activities.

The team has compiled data from past Festivals to identify the composition of each of these groups. This allows us to more specifically identify the total number of persons within the Site and the travel patterns associated with each user group.

### Festival Traffic Generation (Vehicle Occupancy)

Festival vehicular traffic generation is a function of the number of person trips and vehicle occupancy. Vehicle occupancy varies based on the overall user cost (parking and fuel), travel distance, and difficulty to access the Site. Higher parking costs, further travel distances, or more challenging access all combine to result in higher vehicle occupancy. No historical vehicle occupancy data is available from the



Brownsville Festival. Anecdotal observations from the traffic control staff and similar Jackson County event identified average occupancy rates between 2.3 and 2.5 persons per vehicle, but in the absence of specific data standard vehicle occupancy data is proposed for application within this analysis. The FHWA procedures Table 5-14b provides the following information within Table 3 on multiday events.

**Table 3. Vehicle Occupancy Data**

<b>FHWA Table 5-14b. Example Planned Special Event Vehicle Occupancy Factors: Continuous Event</b>		
<b>Event</b>	<b>Attendance</b>	<b>Average Vehicle Occupancy</b>
1997 Stonewall Jackson Heritage Arts & Crafts Jubilee – West Virginia	45,000 to 50,000 (four-day total)	2.46 persons per automobile
1997 West Virginia Honey Festival	6,000 (two-day total)	2.15 persons per automobile
1997 West Virginia Wine & Jazz Festival	3,500 (two-day total)	2.42 persons per automobile
22 <sup>nd</sup> Mountain Heritage Arts & Crafts Festival – West Virginia	25,000 (three-day total)	2.30 persons per automobile
Average	21,125 persons	2.33 persons per automobile

This table shows that within the four studies conducted, vehicle occupancy for multiday events ranged from 2.15 persons per vehicle to 2.46 persons per vehicle, with an average occupancy of 2.33 persons per vehicle. It was not known whether any of these events in 1997 included overnight camping and if separate fees were required for parking. For analysis purposes within this TIA the average vehicle occupancy rate was applied.

We anticipate that with the cost of parking at the festival and the increase in fuel costs since the 1997 studies that the actual occupancy rates will be higher than those from the national studies summarized within FHWA Table 5-14b.

#### Traffic Arrival and Departure Rate

Understanding when vehicles arrive at and depart the venue is important in overlaying the Festival profile with those of the surrounding roads and freeway. While ideally the traffic arrival rate would be based directly on the specific time vehicles arrive at the Festival site, data is only available from the Brownsville Festival at the entry gates. When ticketed attendees pass through the entry gates their unique ticket ID numbers are scanned into the automated system, providing hourly attendance information within the Festival.

Campers may arrive at or leave the gated music venue during the Festival without leaving the overall festival grounds, and the data does not distinguish between exiting and entering persons (values only show overall persons beyond the gated music venue). Accordingly, this data does not provide a complete arrival profile, but does provide an indication of the overall arrival trends (particularly of day-use attendees). As shown within the data, the trends vary substantially by day in terms of both the profile and the hourly arrival numbers. *Note that on site hourly attendance information provided to the project team by a national ticketing agency. Ticket capacities are pre-set and include paid and non-paid patrons, volunteers, staff and support staff.*

## Festival Arrival Patterns

Attendance data within Figure 35 shows that Friday and Saturday experience similar event attendance, with lower attendance on Thursday and Sunday. While Thursday attendance is lower, this is also the day that campers will arrive at the site. The camping arrivals will use different festival accesses, operate larger and slower vehicles, and require more coordination and information at check-in than day-use attendees as further described within this report. The site opens earlier for campers than the event gates to stagger these uses.

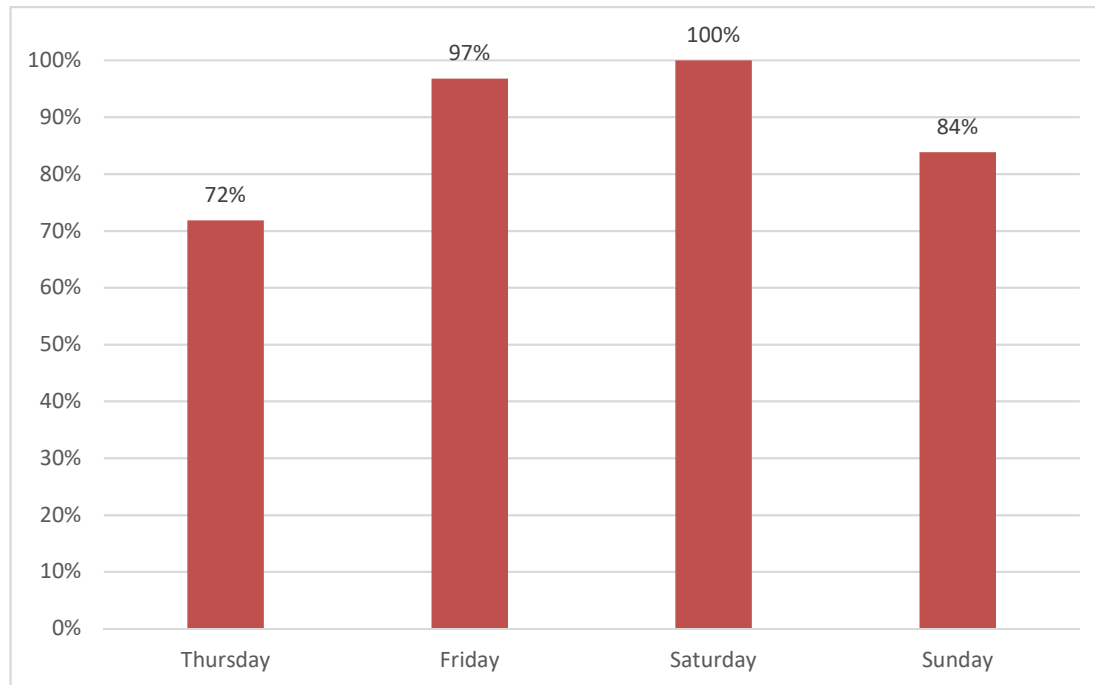


Figure 35. Daily attendance trends.

Figure 35 shows the daily attendance trends for the event. It should be noted that while maximum attendance occurs on Saturday, the recorded attendance was less than the 25,000 persons authorized in Brownsville. This reflects that not all tickets are sold, and not all persons that purchase event tickets show up each day. A substantial number of tickets are donated through sweepstakes or given to volunteers that may not have the same incentive to attend the event as someone purchasing event tickets, however these are still accounted for in the total allowable attendance. Regardless, while historical attendance is approximately 80% to 85% of the maximum allowed occupancy (based on third party gate attendance data), within this analysis it is assumed that Saturday attendance will include up to 30,000 persons.

In addition to variance in days, the attendance data was also used to identify the hourly arrival patterns. Again, the data available from the national ticketing agency does not distinguish between arriving and departing attendees and volunteers, or provide any information about daily outings by campers; the only information available is total persons beyond the music venue gates between the hours of noon and approximately 11:00 p.m. The critical information from this data represents the hourly change in attendees, as this reflects an approximate arrival rate (during the hour prior to when the data is reported). This automated information was not considered to fully reflect the event characteristics, and so was supplemented with information from the event traffic management team to better match field conditions.

Again, the arrival patterns within a specific day could vary based on the day of week and performances. The arrival trends provide an indication of hourly trends, but these trends are expected to vary annually, and the amplitude of the change will vary based on overall event attendance. For analysis purposes two elements were incorporated into the analysis:

- Arrivals by hour (expressed as a percentage to vary based on potential event attendance), and
- Maximum observed percentage change in any hourly period to estimate a maximum arrival rate.

This data shows that on weekdays attendance increases after typical workday hours with the highest arrival rate during the 4:00 p.m. and 5:00 p.m. hours in advance of the headliner acts. On weekends the rates gradually increase throughout the day with a similar peak arrival rate during the early evening hours.

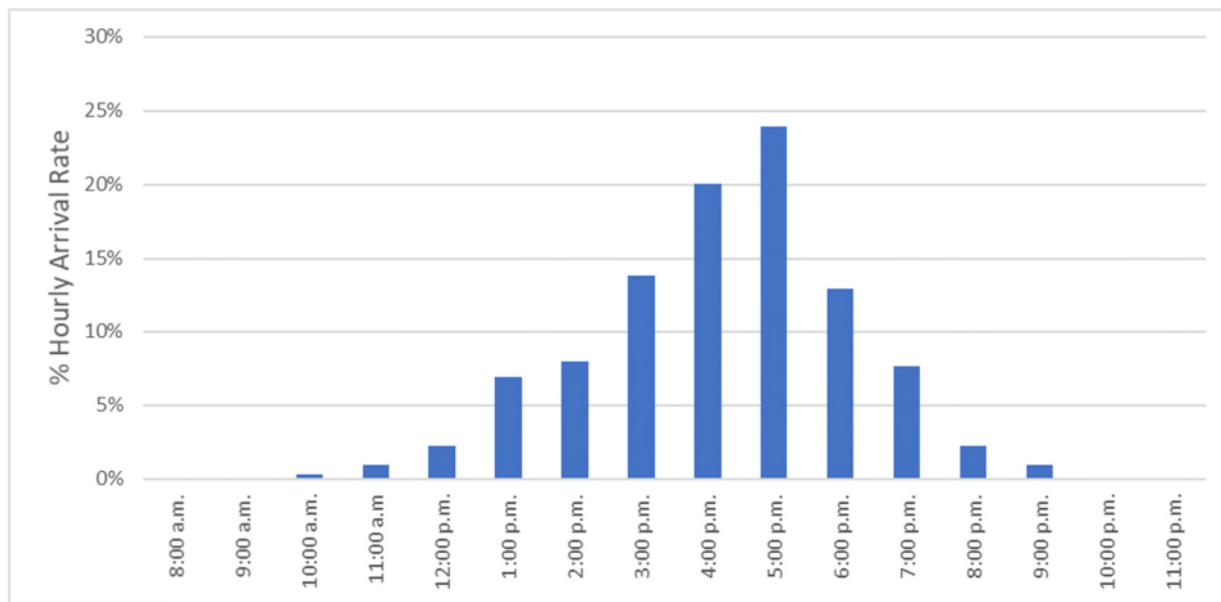


Figure 36. Typical Weekday Day-Use Event Arrival Pattern.

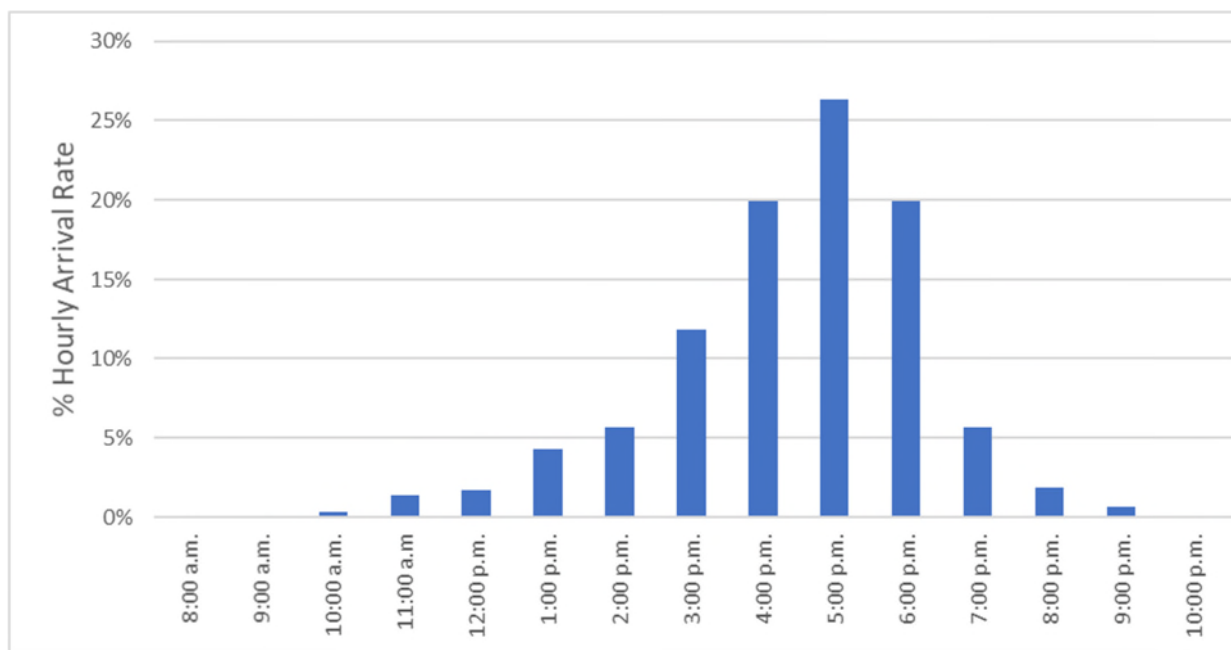


Figure 37. Typical Weekend Day-Use Event Arrival Pattern.



Event attendance is only one component of the trip generation profile for the festival. Day-use attendees (those that are not camping on-site overnight) are expected to bring the necessary supplies and equipment for the entire day, with no local trips outside the venue until they depart for the evening.

Campers are more likely to have some level of daily trips to local attractions, dining or recreation establishments, or nearby shopping. The number of trips is influenced somewhat by the amenities available within the area and the difficulty in exiting the site. WCMF staff overseeing the event indicate that the majority of campers pack food and supplies for the entire weekend, with limited trips off-site until their departure. Events are provided on site throughout the entire day (including the secondary sunrise stage, firemen's breakfast, etc.). Local outings are expected to generally occur in the morning and early afternoon hours prior to 2:00 p.m. between Friday and Sunday.

### Festival Departure Patterns

Discussions with the project team identified that during a typical day 20 to 25 percent of the attendees will leave the venue prior to the completion of the final performance to avoid the crowds and delays. For conservative analysis purposes it is assumed that 95% of event attendees stay until the completion of the final performance. This time period varies by day, with Thursday and Sunday concluding at 9:30 p.m. and Friday and Saturday extending until 10:30 p.m. Most attendees depart during that same hour, with some stragglers choosing to leave after traffic dissipates.

Departure patterns for the campers are different than those of day-use attendees. While some of the campers will depart the event following the completion of the Sunday night performances, official check-out occurs at 10:00 a.m. on Monday morning, allowing longer-distance trips to rest and recover before departing the site. No data is available from prior events on the percentage of campers that stay until Monday morning. It is expected that a significant portion will be returning to work on Monday morning, so we assumed that approximately 60% will remain on-site overnight Sunday, with site departures Monday beginning early in the morning.

The combination of daily festival arrivals and nightly departures, campers event arrivals and departures, and daily outings is summarized in Figure 38. This highlights the difference in overall trips associated with varying daily attendance levels, vehicle occupancy, and separates inbound and outbound vehicular trips.

## STEP 2: MARKET ANALYSIS

The purpose of the market analysis is to identify where the trips in Step 1 are traveling to and from. This includes two separate distribution patterns for the more regional arrival/departure trips and convenience trips associated with campers and local volunteers.

The attendance for the 2019 event will be limited to 30,000 attendees, inclusive of event staff, vendors, volunteers, and performers. Based on review of prior events in Brownsville the proportion of event attendees by category is shown in Figure 39. This chart highlights the two categories of persons that comprise approximately 96% of the event attendees: Day-Use Attendees and Campers. To provide the most effective traffic management strategies, efforts will particularly focus on these attendee populations. The arrival and departure of sanitation staff, performers, vendors, and other minor categories will be well within the margin of error of these other categories.

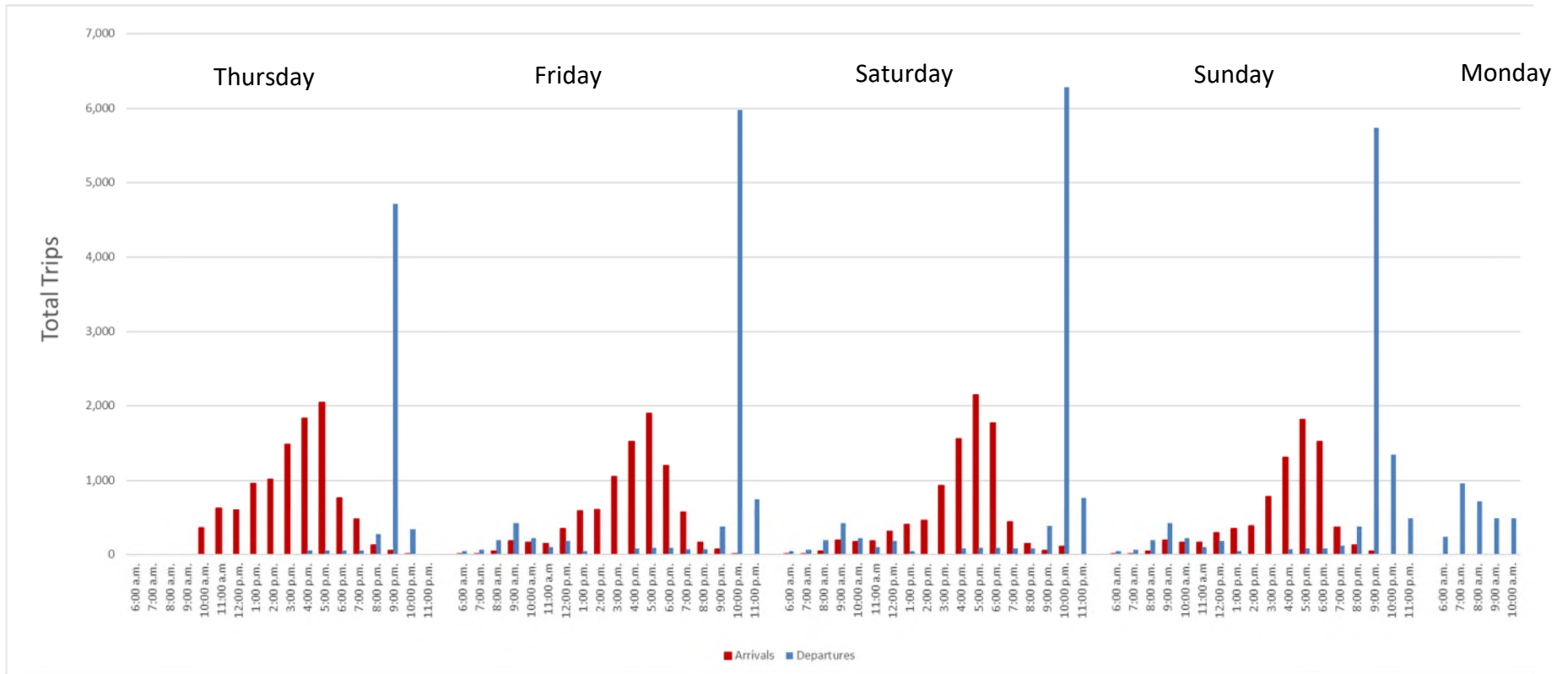


Figure 38. Daily Trip Generation Demand Profile (Thursday through Monday Shown)  
*Actual outbound flows will occur over two hours due to the ingress/egress configuration*

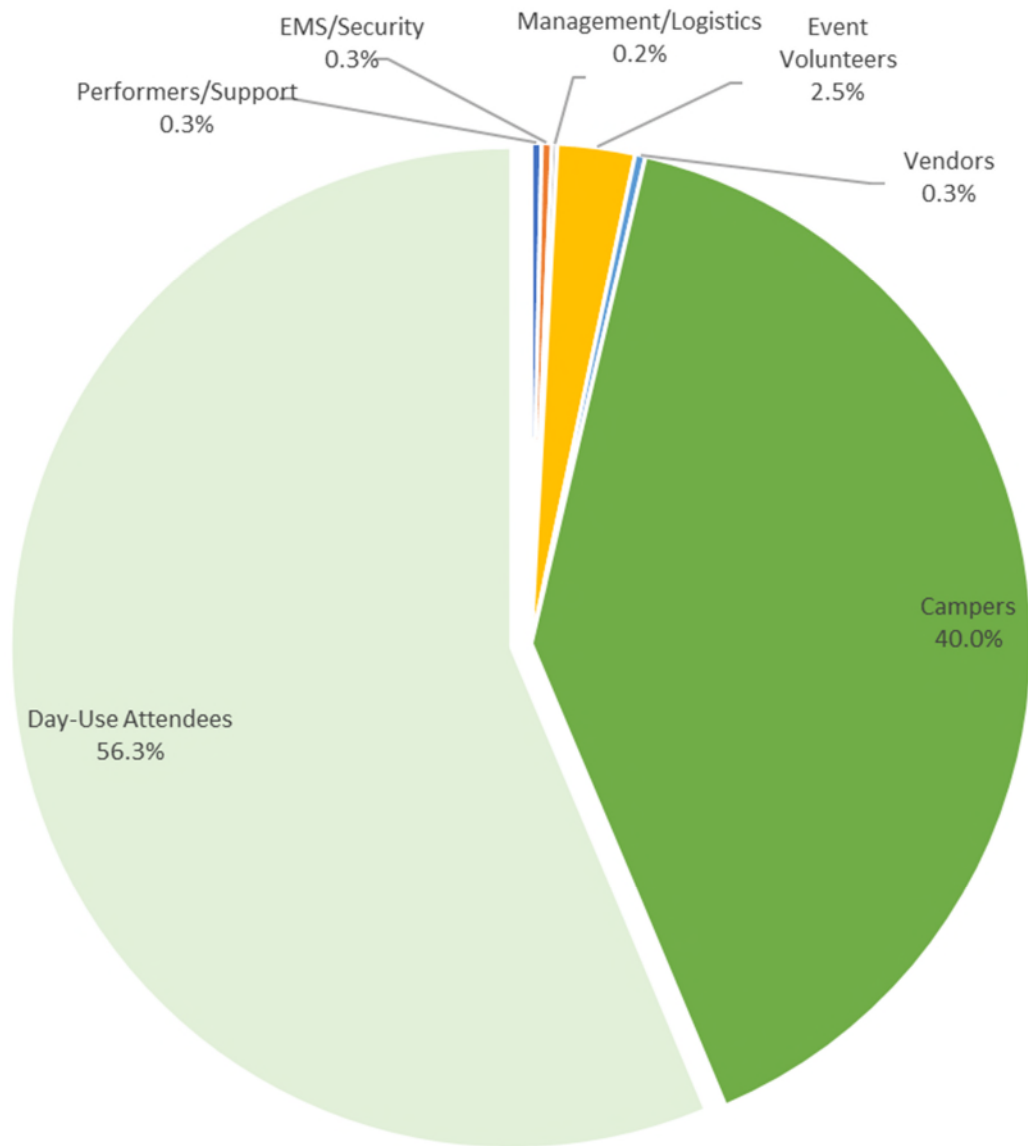


Figure 39. Approximate percent of event attendance by category

### Arrival and Departure/Day Use Trips

Given the historical ticket information available from the Brownsville site, this step can be readily prepared for ticketed Festival attendees, which comprise the majority of the trips, particularly during the peak demand periods. Ticketing sales and subsequent data are provided to the project team by a national ticketing agency. Zip code information available from the ticketing agency was mapped to approximate where event patrons' residences are located, as shown in Figure 40. This shows that Festival attendees are primarily traveling from cities located along the I-5 corridor.

Information from this heat map was then aggregated to the various Site access routes. For example, Festival attendees from Eugene and Portland are assumed to travel to the site via the I-5 corridor, whereas attendees from Dallas or Independence are more likely to use the Marion County roadway system. This information was compiled to define the estimated trip distribution patterns for the overall event, as shown in Figure 41.



## Event Volunteers

Event volunteers are expected to exhibit a more localized distribution pattern. Volunteers may purchase general camping but are not charged for parking. In the initial year the site relocates to the Ankeny area many of the volunteers are likely to continue to travel from the Eugene area. The proportion of volunteers from Salem, Albany, and Jefferson is expected to increase over time.

## Campers

Campers generally arrive throughout the day on Thursday and depart the site either on Sunday evening or Monday morning. Camping sites allow RV's, tent camping, and are large enough to accommodate an additional vehicle. It is anticipated that trips from campers may seek out local attractions, services, and recreational opportunities. This could include trips for coffee or breakfast in the morning, lunch outings, or the arrival and departure of friends/family prior to the start of the concert with the second purchased vehicle parking pass. Day trips could also include use of the Ankeny Wildlife Refuge trails, the Enchanted Forest, and goods and services in South Salem and Jefferson.

Prior events in Brownsville have shown that after arriving at the festival campers generate relatively few daily trips. Typically, campers prepare for the concert and remain on-site throughout much of the weekend. While the start times for the gate opening varies daily from 3:00 p.m. on Thursday to 11:00 a.m. on Saturday, events for campers occur throughout the day on the secondary *Sunrise Stage* starting at 9:00 a.m. Food vendors remain on-site, and events such as the firemen's breakfast (daily Friday through Sunday from 7:00 a.m. to 11:00 a.m.), providing dining and social activities for event patrons.

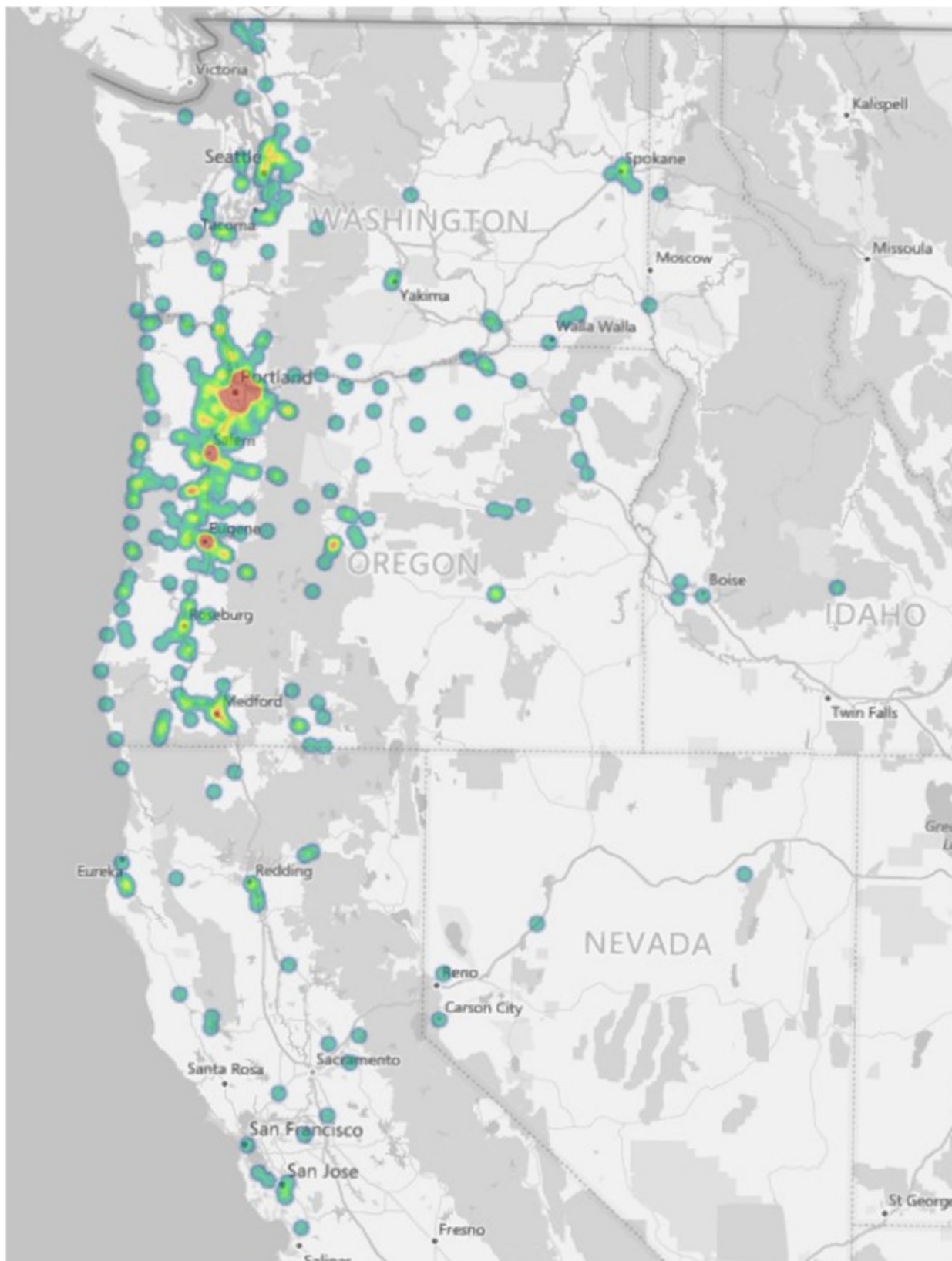


Figure 40. Heat Map Compilation of Automated Ticket Sales Zip Code Data.

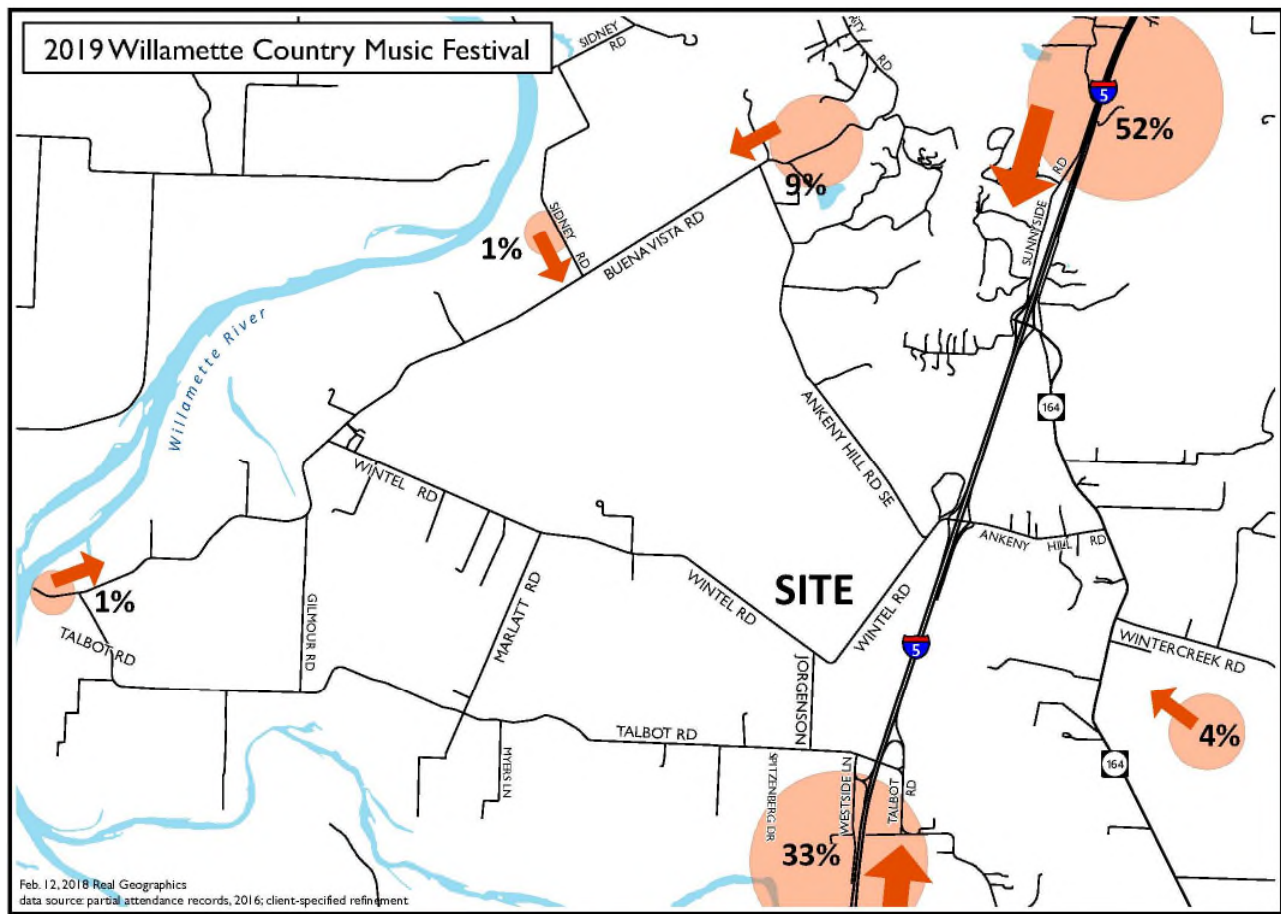


Figure 41. Estimated Arrival and Departure Trip Distribution Data Based on Ticket Sale Zip Codes

### STEP 3: PARKING DEMAND ANALYSIS

The purpose of the parking demand analysis step is primarily for events that occur in urban areas that already accommodate background parking demands during non-event periods. This step is less applicable to the Willamette Country Music Festival as there are no parking demands within the fields outside of the event period. However, this does help to highlight that event parking can adequately accommodate projected attendance without spillover. Within this step parking demand was simplified to only consider campers and day-use attendees; support staff, performers, vendors, and volunteers were all classified within the daily trips to conservatively show that adequate on-site parking will be provided.

The on-site camping activity will include 3,000 camping spaces on 250 acres. The camping spaces have a maximum occupancy of six people and provide adequate space for an RV and a small tent, or for two tents. Assuming an average of 4.0 persons per camping site and a higher vehicle occupancy within the camping section of 2.5 persons per vehicle this area will accommodate approximately 12,000 attendees and their vehicles. The camping sites can accommodate two vehicles, and parking aisles include wider 35-foot travel lanes for maneuvering.

After accounting for the camping sites and associated parking, this leaves the potential parking demand to accommodate up to 18,000 persons per day. Parking requirements for the 18,000 daily Festival attendees is based on an average vehicle occupancy rate of 2.33 persons per car, resulting in an estimated maximum of 7,725 vehicles each day. As a general rule of thumb, approximately 132 parking stalls can be assumed per acre for unstriped temporary use resulting in the need for approximately 59 acres of land



designated for day-use parking. Areas designated *Premium Parking*, *General Parking North* and *General Parking South* contain 89.5 combined acres, which provides 30 acres (51%) more on-site parking capacity than required. In addition, there will be 4.5 acres designated for 250 handicap parking spaces. Figure 42 illustrates the preliminary festival parking layout.

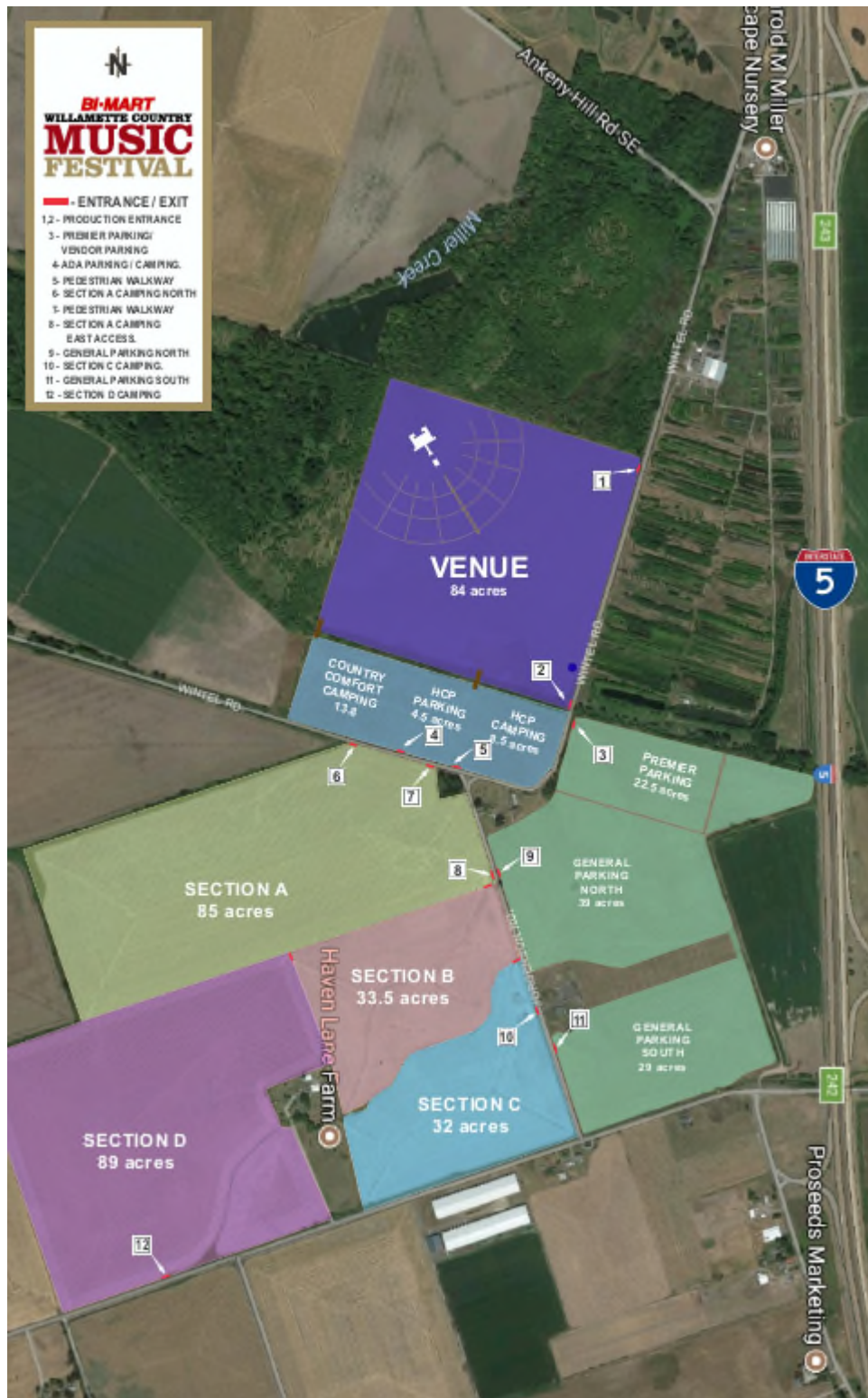


Figure 42. Preliminary WCMF Camping and Parking Layout

Even assuming lower vehicle occupancy rates, the surplus space provided is more than adequate to accommodate the forecast parking demands without spillover.

#### STEP 4: TRAFFIC DEMAND ANALYSIS

The fourth step in the feasibility process is to identify what the demands on local roads are during non-event periods (in August to coincide with the event). This “background” analysis also needs to account for planned road closures and detours that are ultimately recommended as part of the traffic control plan. This step is largely informed by historical data collection efforts completed by Marion County throughout the area in August 2016.

In addition to the historical link data provided by the County, data collection efforts were conducted on Wednesday, January 17<sup>th</sup>, 2018 at the locations shown in Figure 10. These traffic counts were used to calibrate the segment volumes and identify area travel patterns at the intersections. Comparison between the intersection turning movement counts in January and segment counts in August showed negligible variance, with the January counts approximately 2% higher than those recorded during the summertime (as summarized in Table 4). This comparison only applies to the Marion County facilities; travel along I-5 experiences different seasonal patterns that are separately addressed within this report.

**Table 4. Historical and Current Traffic Count Comparison**

Location	Segment Count Date	Day 1	Day 2	Average	January 2018 Counts	% Change
NE Leg of Liberty/Ankeny	7/31/2012	47	42	45	49	110%
SW Leg of Buena Vista/Ankeny Hill	7/31/2012	58	48	53	85	160%
NW Leg of Wintel/Ankeny Hill	8/26/2016	126	146	136	127	93%
NE Leg of Ankeny Hill/Wintel	8/29/2016	146	159	153	137	90%
NW Leg of Wintel/Jorgenson	7/31/2012	32	22	27	24	89%
SW Leg of Wintel/Ankeny Hill	8/26/2016	21	19	20	18	90%
<b>Weighted Average</b>				<b>433</b>	<b>440</b>	<b>102%</b>

In order to analyze the “background” conditions in 2019 without the impact of the WCMF average Daily Traffic (ADT) volumes on the County road system in the event vicinity have been adjusted and increased to reflect the anticipated traffic volumes for the summer 2019. An annual growth rate of two-percent was used based on a review of the projected traffic volumes on the area roadways in the Marion County Rural Transportation System Plan and confirmation with Julia Uravich at the County. Based on the county data, the ADT volumes were further refined to identify the number of trips in each direction on the county roads, for the afternoon and evening commute hours, to correspond with the peak travel hours for attendees arriving at the festival.

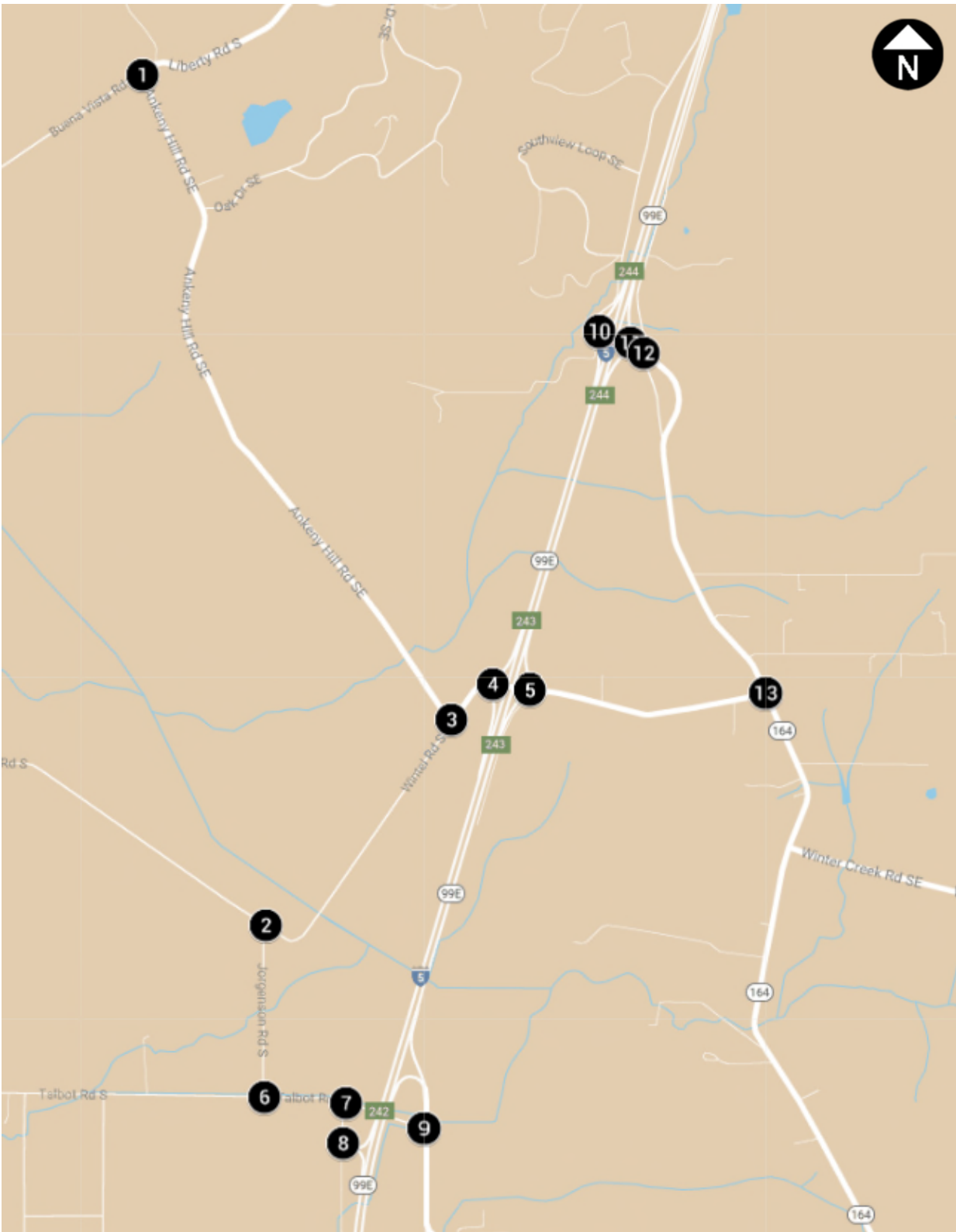


Figure 43. January 2018 Turning Movement Count Locations.



## STEP 5: ROADWAY CAPACITY ANALYSIS

This section of the report reviews the available capacity within the supporting roadway network to accommodate the forecast year 2019 traffic volumes within a non-event period and overlay these conditions with the event traffic developed in Steps 1 and 2. This analysis was conducted within a four-tiered process:

1. Are there adequate entrances and exits to accommodate the traffic flows entering during peak times or exiting after the final performances?
2. Does the intersection of various County or Interstate ramps provide adequate capacity in their current configuration to effectively process the forecast demands?
3. Can the County roadway system accommodate the forecast travel demands within the existing roadway sections?
4. Can the I-5 system accommodate typical and event traffic demands from the north and south? Will the interstate system be operating within or over its carrying capacity, and how will this influence traffic control needs or the potential use of alternate routes?

The order of these steps was provided to reflect the metering that occurs within the transportation system, as shown within this analysis, the ability to exit the Festival and access the I-5 corridor will be limited by the capacity of the County roads.

### Event Entry and Egress Analysis

The festival layout is separated by Jorgenson Road and Wintel Road. As shown in Figure 42, the main stage is located on the northernmost field. The layout of the site has been revised to combine Premium and General Admissions parking east of Jorgenson Road for ease of control, with Premium Parking located closest to the venue. General admission parking is located south of the Premium parking.

The layout of the site allows multiple access points into the parking stalls and substantial internal queue storage area. Since the parking area is required to be vacated each night ingress flows simply start at the back of a row and fill in as patrons arrive, increasing the parking efficiency by removing the need to search for a parking stall. On-site parking staff will direct vehicles to the appropriate rows, allowing inbound maneuvers to occur efficiently.

Camping activities will occur on the west side of Jorgenson Road. Each Campsite is pre-marked with marking flags and placards that correspond with the campers' assignment. Campers are pre-mailed their coinciding vehicle placards to display in their windows. Staff and Volunteers are present to direct campers to the appropriate sections upon arrival. There is an established cut-off date to purchase camping passes, and no campsite purchases are allowed on site.

In order to effectively allow event patrons to return to the camping sites or parking areas after the end of daily activities, clearly designated pedestrian routes will be provided from the gated venue area. The internal layout was developed to reduce conflict points with clearly designated pedestrian crossing areas and by separating traffic from the north and south to prevent conflicting movements while exiting. The following strategies are recommended:

- It will be critical that pedestrians do not travel down the roadways heading to or from the event. Fencing around the parking and festival areas will be necessary to ensure that pedestrian crossings occur only at designated locations and with appropriate flagging control.

- Getting vehicles off Wintel Road and into the parking areas will be important to avoid queues and back-ups onto the I-5 corridor. Ingress into the parking fields will need to provide a higher capacity than the inbound flows through multiple and controlled event access points.
- Due to the cost of Festival Tickets more than 95 percent of the Event tickets are pre-purchased. The only parking available to purchase on site is General Admission Parking. Vehicles entering the General Admission parking area without a pre-paid parking pass are met by one of six parking volunteers to sell them a parking pass. The Festival communicates prior to event that general admission parking is available on site and only cash is accepted.
- Handicap parking is provided near the gated venue area.

With these strategies coupled with the layout and event routes shown, event attendees will be able to efficiently exit the County roads and enter the site.

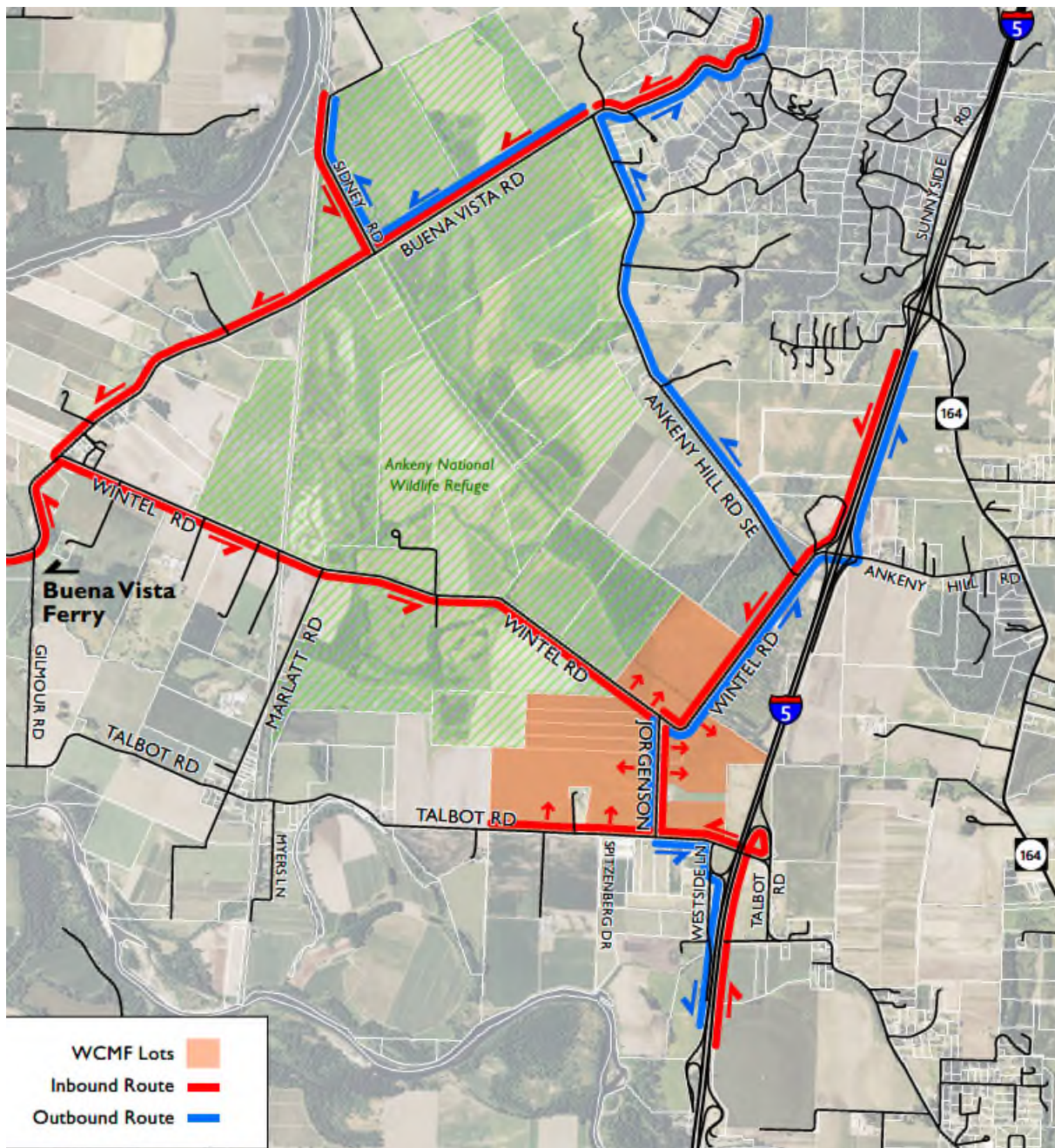


Figure 44. Proposed Vehicle Routing Map

## Intersection Analysis

This section describes the intersection analysis. The junction of roadways and traffic control right-of-way designations are expected to provide the most significant constraints to traffic flow entering and exiting the event. The intersection analysis was conducted at intersections and I-5 ramp terminals along the primary ingress and egress routes, as illustrated in Figure 43.

Conditions for an event are typically prepared both for background (no-build) and with-event conditions to provide a comparison and highlight the impact of the event. However, area roads experience very low volumes, and field review shows that all of the area intersections currently operate well within agency performance standards today, likely at Level of Service "A" or "B," indicating very low delays within this rural area.

The operations analysis was prepared using Synchro 10 analysis software and Highway Capacity Manual 6<sup>th</sup> Edition methodologies. Typical adjustment factors were included within the analysis (heavy vehicles, pedestrians, reduced saturation flow rates, etc.). Since the peak departure period is expected to include relatively stable and heavy traffic flows a peak hour factor of 1.0 was applied to this time period. A peak hour factor of 0.95 was applied to all other time periods within the study area.

As previously described within this report, January traffic volumes on the county roads were nearly equivalent to historical summer counts within the area. The traffic volumes collected in January 2018 were adjusted to reflect summer 2019 conditions through the application of a two-percent annual growth rate and were adjusted using the roadway profiles to reflect the peak event analysis periods.

The intersection analysis was conducted based on the existing traffic control. The purpose of showing the current conditions is to highlight the locations that will require mitigation measures to accommodate the projected traffic demands. Assessment of peak conditions was prepared by combining the hourly traffic flow profiles with the event trip profiles to identify critical time periods within the system. This review shows that with the low area traffic volumes the event peak hours will serve as the most critical time periods. This includes the Thursday evening arrival peak hour (5:00 p.m.) and the Saturday departure peak (starting at 10:30 p.m.). These peak hours reflect the highest inbound and outbound flow rates during the event assuming full event attendance of 30,000 persons.

## Event Ingress Peak Conditions

The operational analysis of peak arrival patterns confirmed key area deficiencies with the current traffic control, assuming traffic from the north is routed toward the Ankeny interchange and traffic from the south utilizes the Talbot Road interchange. This analysis includes a high percentage of RV traffic, as campers are still arriving on-site into the early evening hours. All camping traffic is routed to entrances along Jorgenson Road and Talbot Road, which will create some level of conflicts with pedestrians crossing from the General Admission area and heading toward the venue.

- The most constrained portion of the travel route is the Wintel Road section serving southbound I-5 traffic from the north.
  - The I-5/Ankeny Hill Road interchanges operate over capacity with queues that would extend onto the I-5 mainline without traffic control changes.
  - The intersection of Wintel Road/Ankeny Hill Road also exceeds capacity in its current configuration, with the route toward the festival controlled by the stop sign.
- The Talbot Road interchange configuration stops the highest-volume northbound I-5 off-ramp flow onto westbound Talbot Road. While conflicting volumes are low, this configuration



significantly increases the likelihood for queue spillback onto the I-5 mainline and will require traffic control changes.

- Intersections along County roads toward south Salem and Independence are well within their carrying capacity and will not require changes to the existing traffic control.
- Event patron use of the North Jefferson Interchange is expected to be low; however, if event traffic uses this exit to access Ankeny Road from the Jefferson Highway it would create additional conflicts with the constrained Ankeny Hill interchange operations.

### Event Departure Peak Conditions

Event departure patterns occur at 9:30 p.m. on Thursday and Sunday and at 10:30 p.m. on Friday and Saturday. At these times the County roads are generally operating with a single vehicle every five to ten minutes under background conditions. The low surrounding volumes substantial reserve capacity to accommodate event traffic.

The peak departure event occurs on Saturday evening when event attendance is highest. During this period the majority of vehicles are passenger vehicles, with most RVs and campers expected to remain in place. Within the analysis the flows are overwhelmingly outbound, with limited trips inbound reflecting Uber/taxi service. In addition, most campers are expected to remain in place, with some outbound travel associated with guest vehicles departing for the evening. Trips for these uses were added to the analysis.

- The Wintel Road segment toward I-5 north again reflects the primary system constraint, with the Wintel Road segment toward Ankeny Hill Road operating over capacity, and with stop-control affecting the primary egress route.
- The route toward I-5 south at Talbot Road operates over its carrying capacity and will also require more than a single hour to serve the demands.
- Marion County roads operate acceptably toward Independence and south Salem.

### County Road Analysis

The second tier of the analysis was to assess the ability of County roads to carry the forecast traffic volumes. Unlike the I-5 corridor, area roads serve very low volumes today and the event traffic will comprise the majority of the vehicles on the facilities. As such, event peaks will dictate Country roadway facility peaks.

The review of County roads in the site vicinity was based on the HCM 2010 methodologies and ODOT's Analysis Procedure Manual Version 2 Addendum 11B. The County roadways near the site are categorized as Class II Two-Lane Highways for the purposes of the analysis. Class II highways are typically collector and local roads where travel at high speeds is not the primary objective of motorists. These roadways provide connections to arterials such as I-5 and River Road and generally pass through undeveloped areas.

The operations of two-lane highways can be determined by analyzing the Level of Service of a segment. However, capacity analysis is important for special event planning. Both are based on the percent time spent following, which represents the average percentage of time vehicles are in platoons behind slower vehicles due to an inability to pass.

The capacity of a two-lane highway under base conditions is 1,700 passenger cars/hour for a single direction, with a limit of 3,200 passenger cars/hour for the total of both directions. The interaction of the opposing flows of traffic is such that when one direction is at capacity with 1,700 passenger cars/hour, the maximum opposing flow would be limited to 1,500 passenger cars/hour.

The capacity of a Class II Two-Lane Highway is calculated with the equation,

$$C_{dPTSF} = 1,700 f_{g,PTSF} f_{HV,PTSF}$$

$C_{dPTSF}$  is the capacity in the analysis direction under prevailing conditions based on the percent time spent following.

$f_{g,PTSF}$  is an adjustment factor to account for the road grade. For level grades such as on the study roadways, this factor is 1.00.

$$f_{HV,PTSF} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$$

$f_{HV,PTSF}$  is an adjustment factor to account for trucks and recreational vehicles in the traffic flow. To calculate the heavy vehicle adjustment factor, a base capacity of 1,700 passenger cars/hour is used when reviewing the tables in the HCM 2010. For any vehicle demand greater than 900 vehicles per hour, which is what is used when calculating capacity, the values for  $E_T$  and  $E_R$  are 1.0 based on Exhibit 15-18 from the HCM 2010. Therefore, regardless of the percentage of trucks and recreational vehicles,  $f_{HV,PTSF}$  is equal to 1.0 when determining the capacity on these roadways. Essentially, trucks and RVs provide a significant factor in the percent time spent following other vehicles, but at higher volumes the impact of these vehicle types is lessened due to the increasing congestion.

$$f_{HV,PTSF} = \frac{1}{1 + P_T(1.0 - 1) + P_R(1.0 - 1)}$$

And  $C_{dPTSF} = 1,700 * 1.00 * 1.00$

$$C_{dPTSF} = 1,700 \text{ veh/hr}$$

Given the balanced directional distribution assumed for the background 2019 volumes, the two-way capacity of the segment would be 3,400 vehicles per hour. This exceeds the limiting capacity of 3,200 passenger cars per hour; therefore, a total two-way capacity of 3,200 passenger cars per hour would prevail, with a directional capacity of 1,600 vehicles per hour. This segment flow rate will meter the amount of traffic that can exit the festival at a given time, limiting the demands that can reach area intersections and the I-5 corridor.

### I-5 Analysis

The roadway capacity analysis on I-5 was based on Highway Capacity Manual (HCM) 2010 methodologies, in collaboration with ODOT Analysis Procedures Manual (APM) methodologies. As of January 19, 2018, the ODOT APM webpage states that “Chapter 11 – Segment Analysis – Not Yet Complete,” so the operations analysis was based on the HCM 2010, Chapter 11 Basic Freeway Segments, with application of seasonal calibration factors per the APM.

Information on this adjacent section of I-5 was provided from ODOT TransGIS is summarized in Table 5.

**Table 5. I-5 (ODOT Highway No. 1) Characteristics**

Metric	Value
Average Annual Daily Traffic (AADT)	62,900 (2016 Data) - MP 241.83 Talbot Road
Truck Percentage	23.65%
Design Hour Factor (K)	8.9
Directional Factor	52
Posted Speed	65 mph
Safety Priority Index System (SPIS) Sites	<ul style="list-style-type: none"> <li>• Talbot Road Southbound Interchange (90 - 95<sup>th</sup> Percentile)</li> <li>• MP 231.41 (90 - 95<sup>th</sup> Percentile)</li> <li>• MP 232.37 (90 - 95<sup>th</sup> Percentile)</li> </ul>
<b>I-5 Southbound (North of Talbot Road)</b>	
Travel Lane Width	12 feet
Left Shoulder Paved Width	10 feet
Left Shoulder Gravel Width	0 feet
Right Shoulder Paved Width	4 feet
Right Shoulder Gravel Width	0 feet
<b>I-5 Northbound (South of Talbot Road)</b>	
Travel Lane Width	12 feet
Left Shoulder Paved Width	4 feet
Left Shoulder Gravel Width	0 feet
Right Shoulder Paved Width	10 feet
Right Shoulder Gravel Width	0 feet
<b>I-5 Southbound (North of Ankeny Hill)</b>	
Travel Lane Width	12 feet
Left Shoulder Paved Width	10 feet
Left Shoulder Gravel Width	0 feet
Right Shoulder Paved Width	6 feet
Right Shoulder Gravel Width	0 feet
<b>I-5 Northbound (South of Ankeny Hill)</b>	
Travel Lane Width	12 feet
Left Shoulder Paved Width	4 feet
Left Shoulder Gravel Width	0 feet
Right Shoulder Paved Width	10 feet
Right Shoulder Gravel Width	0 feet

Field observations and data from the ODOT TransGIS website shows that there is limited right shoulder width on the approaching shoulders for vehicles to park. Accordingly, providing adequate capacity at the ramp terminals and queue storage into the Site will be critical to avoid back-ups that could otherwise affect the mainline.

Data from permanent traffic count station (Automatic Traffic Recorder 22-005) was obtained from ODOT for 2016 and 2017. Within this data, the hourly profile of the coinciding weekend was reviewed. As there were travel impacts associated with the Solar Eclipse (August 21, 2017) impacting the 2017 dataset only the 2016 profile was used, as this is expected to better reflect summer conditions on the I-5 corridor.



Volume data from the I-5 ATR shows that more traffic is carried on the I-5 corridor on Friday than any other day, and daily weekday travel is higher than on weekends though the peak hours on weekends reflect the maximum flows on the facility. The HCM segment analysis was conducted with the ODOT dimensional data and the hourly directional traffic flows. A peak hour factor of 0.95 was assumed based on the high-order facility type.

Equation 11-1 of the Highway Capacity Manual 2010 Edition states that the Free Flow Speed (FFS) for a freeway is related to the lane width ( $f_{LW}$ ), lateral clearance ( $f_{LC}$ ), and interchange ramp density (TRD). For this section of I-5 the following applies:

$$\text{HCM Equation 11-1: } FFS = 75.4 - f_{LW} - f_{LC} - 3.22 [(TRD)]^{0.84}$$

$$FFS = 75.4 - (0.0) - (1.2) - 3.22 [(1.7)]^{0.84}$$

$$FFS = 69 \text{ mph}$$

Equation 11-2 adjusts the demand volumes from passenger cars to passenger car equivalents to account for trucks and recreational vehicles, as follows:

$$\text{HCM Equation 11-2: } v_p = (v * k * d) / (PHF * N * f_{HV} * [f]_p)$$

$$v_p = (62,900 * 0.089 * 0.52) / (0.95 * 2 * 0.89 * 1.0)$$

$$v_p = 1,721 \text{ passenger cars per hour per lane}$$

With use of the hourly ATR data that provides separate directional volumes, assumptions translating the daily flow to peak hour volumes can be removed:

$$\text{HCM Equation 11-2: } v_p = \text{directional } v_{\text{hour}} / (PHF * N * f_{HV} * [f]_p)$$

Exhibits 11-2 and 11-6 identify the capacity curve for a freeway facility with an approximately 70 mph free flow speed. Exhibit 11-2 identifies that the maximum carrying capacity of a freeway segment with a free-flow speed of 69 mph is 2,400 vehicles per hour per lane. Exhibit 11-6 translates this flow into Level of Service and density, as shown in Figure 46.

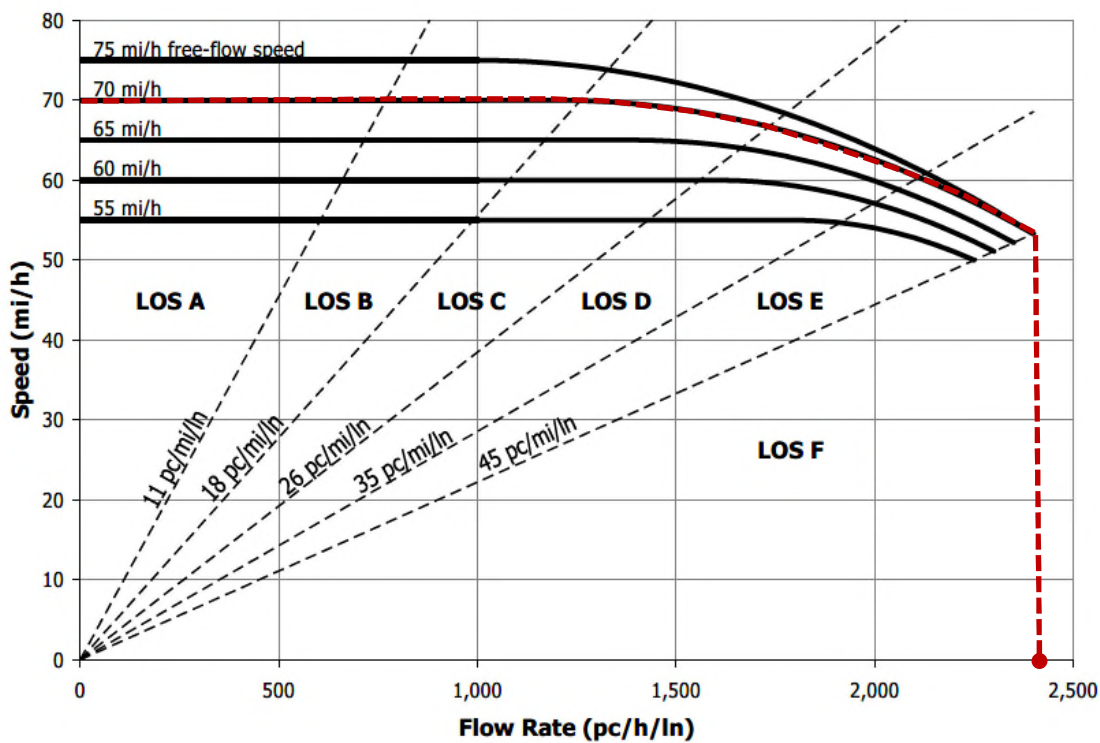


Figure 45. HCM 2010 Exhibit 11-6.

Equation 11-4 summarizes the relationship between the mean speed of traffic ( $S$ ,  $mi/h$ ), demand flow rate ( $v_p$ ,  $pc/h/ln$ ), and Density ( $D$ ,  $pc/mi/ln$ ).

$$\text{HCM Equation 11-4: } D = v_p / S$$

Review of the hourly I-5 capacity plots throughout the festival dates (with 2016 volume profiles adjusted to 2019 volumes) shows that the corridor operates at up to 80% of its carrying capacity in the northbound direction on the corresponding mid-August Sunday during the noon hour.

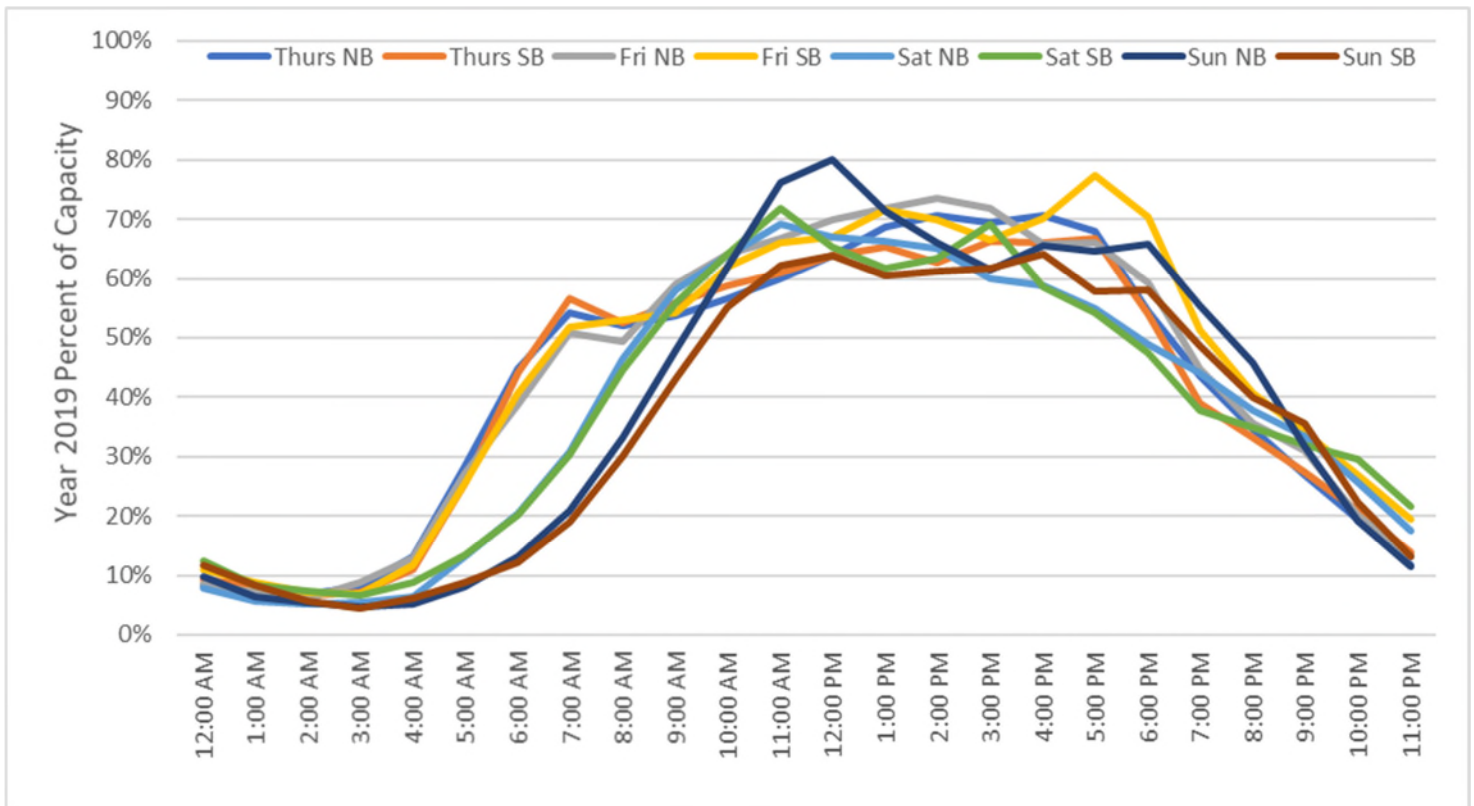


Figure 46. Projected Year 2019 I-5 Directional Mainline Capacity, Background Conditions (Near Talbot Road)  
 Note that the background conditions shown reflect the 25,000 person event in Brownsville.

Generally, this data shows that the I-5 corridor near the Site has a capacity of approximately 2,400 vehicles per hour per lane, and currently serves between 70% and 80% of its carrying capacity. Peak time periods on the I-5 corridor occur during the evening commute period on weekdays and around the noon hour on weekends.

Assessment of I-5 conditions was also prepared with the inclusion of event traffic to understand how the additional vehicles will change conditions on the corridor. The August 2016 traffic volumes were used within the baseline conditions; this double-counts festival impacts as the base volumes already include traffic from the Portland and Salem areas that were traveling to or from the 2016 Brownsville event and provides what is likely an overly conservative analysis of I-5 conditions.

The ability to access the I-5 corridor will be metered during the event egress periods by the segment capacity along the County Roads. The only nearby locations to access the I-5 corridor are the Ankeny Hill and Talbot Road interchanges. These interchanges/overcrossings also provide a connection to Jefferson and other communities to the east but will be limited to approximately 1,600 vehicles per hour that can access the ramp terminals. The peak Saturday egress demand of nearly 6,300 vehicles will require more than a single hour for event patrons to access the interstate system based on the event routes proposed.

Event traffic profiles reflecting the metered flow rates were overlaid on the I-5 volumes from mid-August 2016 that were increased to reflect 2019 conditions. The I-5 corridor analysis shows that the system will narrowly operate above capacity during the Friday evening commute hour in the southbound direction heading toward the event (assuming flows aren't metered due to typical congestion within the urban areas). This could further extend the entry profile into the 6:00 p.m. hour.



During the event egress periods there will be heavy I-5 on-ramp volumes at Ankeny Hill Road and Talbot Road. The on-ramp volumes can be accommodated on the higher-capacity I-5 corridor, but it is recommended that signage inform through motorists on I-5 to use the left lane.

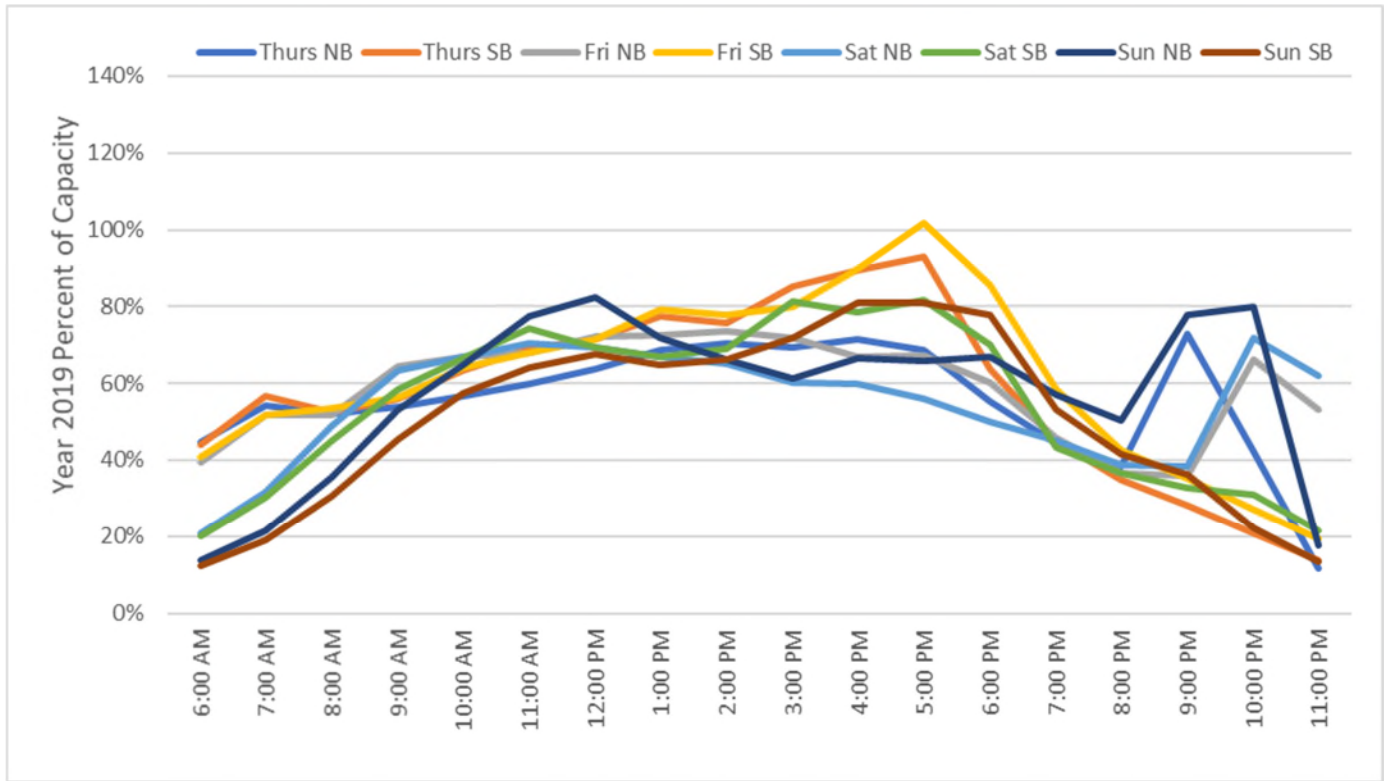


Figure 47. Projected Year 2019 I-5 Directional Mainline Capacity, With Event Conditions (North of Ankeny Hill)  
 Note that the background 2016 traffic volume profiles for I-5 include the approximately 25,000 person WCMF event in Brownsville. Addition of the proposed event trips as shown is double-counting a significant portion of the festival trips.

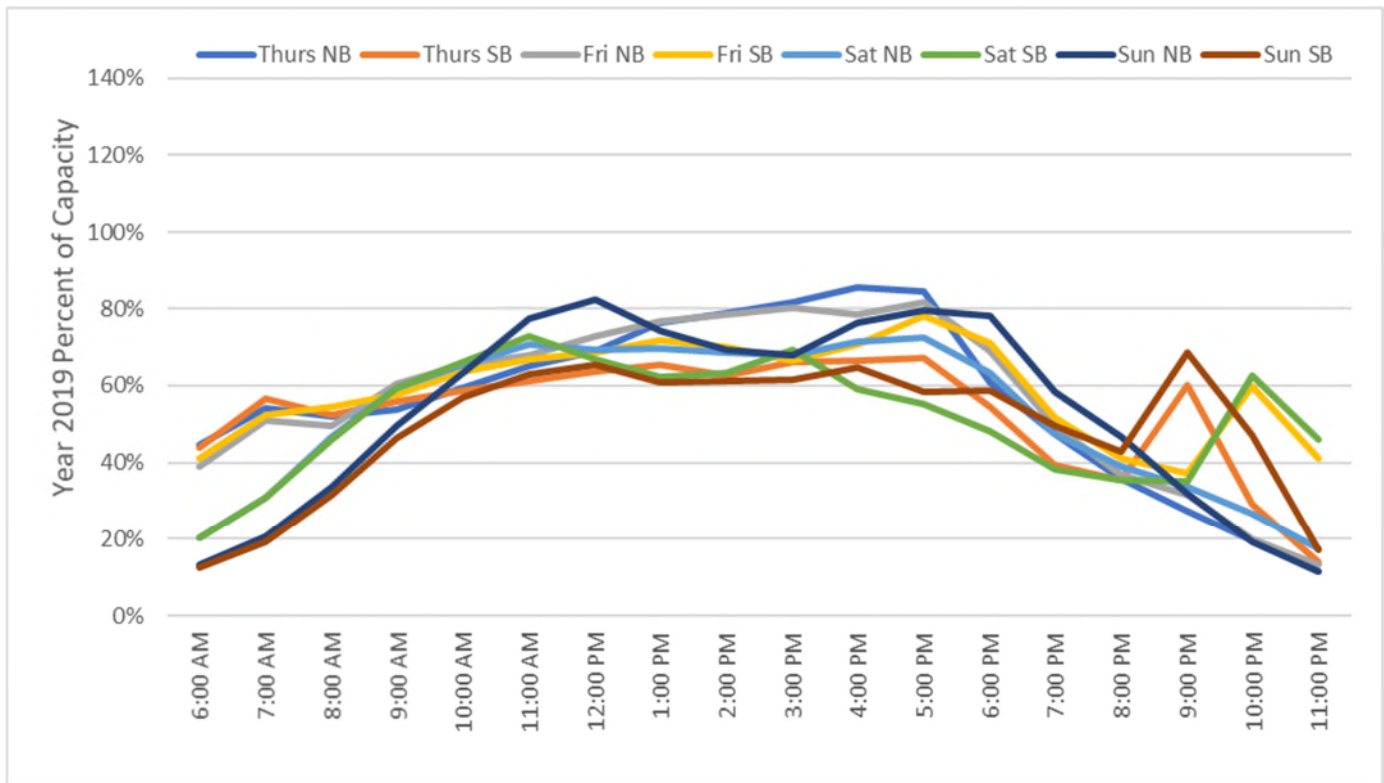


Figure 48. Projected Year 2019 I-5 Directional Mainline Capacity, With Event Conditions (South of Talbot). Note that the background 2016 traffic volume profiles for I-5 include the approximately 25,000 person WCMF event in Brownsville. Addition of the proposed event trips as shown is double-counting a significant portion of the festival trips.

## STEP 6. TRAFFIC MITIGATION PLAN

The final step is to identify a traffic mitigation plan that addresses the identified deficiencies within the analysis. This step builds on the proposed route map shown in Figure 44, which was designed to avoid wildlife refuge and farming impacts from vehicles entering and exiting the event. In addition to changes to the event routes, changes were also made to the internal configuration of parking areas and accessways.

In addition to the revised event routes, the following management strategies are recommended:

- Traffic control along all primary ingress and egress routes will require free-flow movements to avoid excessive delays and queues. It will be necessary to have traffic control changes and flagging staff at the following locations:
  - Ankeny Hill Road/Southbound I-5 Ramp Terminal (see Figure 49)
  - Ankeny Hill Road/Northbound I-5 Ramp Terminal (see Figure 50)
  - Talbot Road/I-5 Southbound Ramp Terminal (see Figure 51)
  - Talbot Road/I-5 Northbound Ramp Terminal (see Figure 52)
  - Ankeny Hill Road/Wintel Road Intersection (see Figure 53)

Traffic control will be required at these locations to serve event ingress and egress. This traffic control should start when RVs arrive on-site on Thursday and should be in place when venue gates open daily and extend until the headline performance begins. Traffic control must remain on-site and transition into egress operations, remaining on-site through the clearance of the entire venue (approximately 1:00 to 2:00 a.m.). Changes to traffic control will need to be appropriately noticed

in advance of the event to allow typical roadway users an opportunity to adjust their travel routes to avoid event delays or traffic control changes.

- Any required coordination with Federal Highway Administration related to changes to traffic control at the I-5 interchanges will be coordinated through ODOT.
- It is recommended that RV access be accommodated both from Ankeny Hill Road and from Talbot Road, but that published materials direct RVs and campers to the Talbot Road interchange. Multiple driveway accesses will be required from Jorgenson and Talbot Road west of Jorgenson Road to facilitate ingress and egress without back-ups onto the County roads.
- Event ingress will utilize two PNWR rail crossings during daylight hours. As these are not primary event routes it is recommended that supplemental red or orange flags are located above the STOP signs at the crossings to increase the visibility and awareness for motorists.
- WCMF will coordinate with the Ankeny Wildlife Refuge to prepare a security plan during the event (Thursday through Monday morning). It is anticipated that this will include additional enforcement staff to patrol the refuge area and viewing pull-outs.
- An on-site impound lot will be provided to support the event. This will include tow vehicles for passenger cars and RVs to assist with typical maintenance, recovery, or impoundment needs.
- A drop-off loop is proposed within the parking area. This will support taxi/ridesharing operations provided within the area.
- Event flagging staff will need to provide adequate ODOT certifications. Critical locations include the I-5 ramp terminals and event entry points.
- Any new (temporary) driveways into the parking fields will require approval from Marion County. This is expected to include gravel driveways over culverts and is likely to include 12 to 15 access locations to serve the various parking areas.
- Pedestrian fencing will be provided around the pedestrian walkways, and marked crossing areas will be designated to connect event patrons with the camping and parking areas south of Wintel Road and east of Jorgenson Road. It is imperative that event staff are available to prevent people from walking along the roads.
- With camping and parking purchase, informational packets will be provided that include information specific to the type of parking purchased. Information specific to camping hours, access routes, and procedures will be included within the packet and available on the website. This information will identify the overhead or dimensional clearance constraints along the surrounding roadways.
- Both Premium and General Parking traffic will be routed into the General Admission parking fields. Access to the Premium Parking area will be through the field to simplify driver decision-making when exiting the public roads.
- Dimensional warning signs and rail crossing signs should be supplemented with orange flags through the event period, to increase awareness of the potential hazards.
- The Festival Command Center will provide a conference phone number to area farmers for a 6:00 a.m. coordination meeting. A neighbor liaison number will also be available should any issues arise during the event.
- Event Monitoring will be required throughout the duration of the event. The on-site Festival command system will include coordination with ODOT Incident Command units, law enforcement, and traffic control staff. The purpose of monitoring is to identify if changes in traffic control or detours are needed to respond to incidents, emergencies, or congestion.
- Variable Message Signs (VMS) will be located on I-5 north of the Jefferson Highway Interchange and south of Talbot Road to provide the event monitoring and incident management teams with the ability to modify event access routes or to inform motorists of conditions. The approval to locate the Variable Message Signs will be coordinated with ODOT.



- During the event, the north Jefferson VMS will instruct southbound I-5 event traffic to use the Ankeny Hill Interchange. Secondary message options will inform drivers to use the north Jefferson Interchange and the Jefferson Highway or the Talbot Road interchange. These options will allow the team to modify the route to respond to contingencies as they occur.
- During the event, the Talbot Road VMS will instruct northbound I-5 event traffic to use the Talbot Road interchange. Secondary message options will inform drivers to use the Ankeny Hill interchange or the north Jefferson Interchange.
- After the event the VMS will instruct I-5 through motorists (northbound and southbound) to use the left-lane. This will support the heavy on-ramp volumes leaving the event.
- Coordination with and approval will be required on the traffic control strategies with ODOT Highway, ODOT Rail, and Marion County staff. Detailed traffic control plans will be prepared and approved subject to ODOT timelines (typically about 60 days prior to the event) to ensure that the plans reflect current conditions.

The following illustrations show the recommended ingress (Red) and egress (Blue) traffic control routes. The arrows highlight the free-flowing maneuvers that will be implemented through flagging staff, cones, and other measures identified within the traffic control design plans following County and ODOT approval.



Figure 49. Recommended Ankeny Hill Road/I-5 Northbound Ramps Event Ingress Traffic Control. *Note: Traffic control will be provided to monitor ramp queues, no change in traffic control is proposed.*

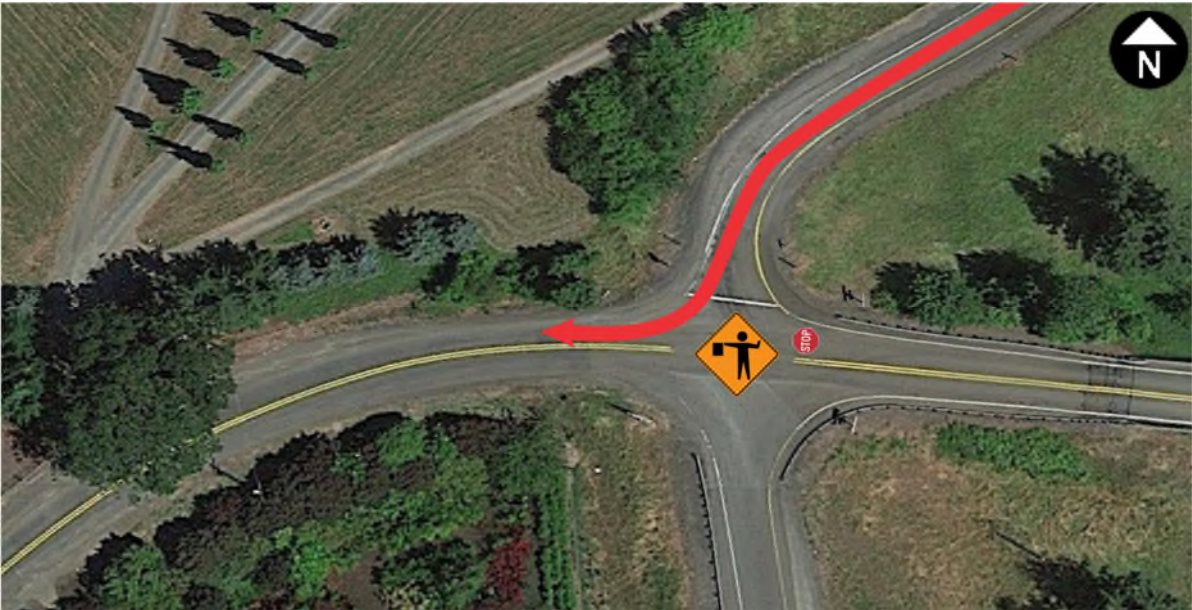


Figure 50. Recommended Ankeny Hill Road/I-5 Southbound Ramps Event Ingress Traffic Control.



Figure 51. Recommended Talbot Road/I-5 Interchange Ramps Event Ingress Traffic Control for I-5 Northbound Traffic.



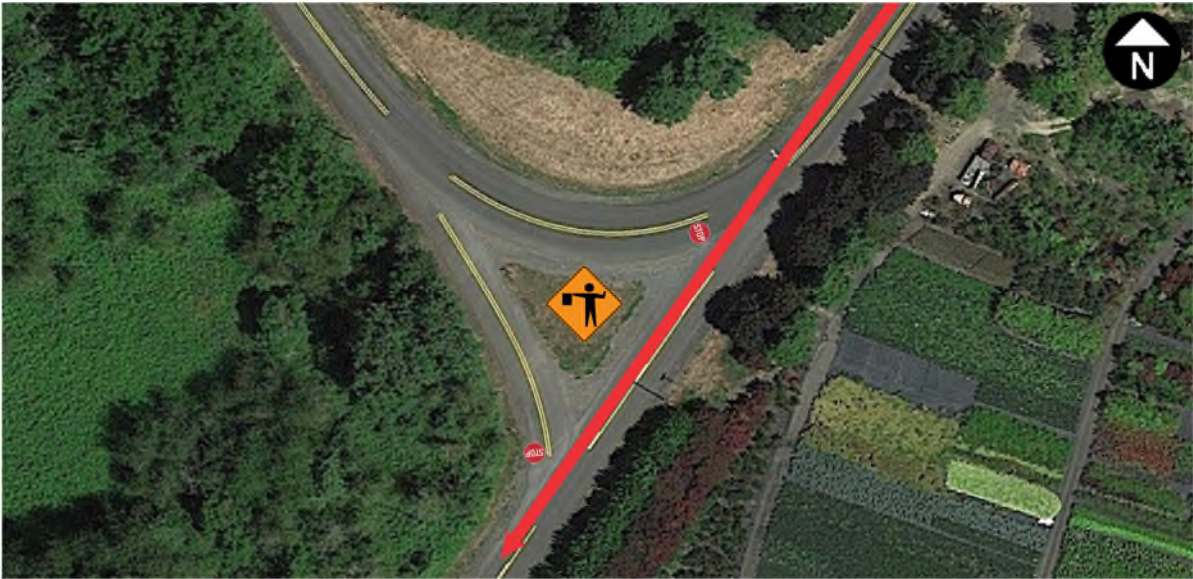


Figure 52. Recommended Ankeny Hill Road/Wintel Road Event Ingress Traffic Control



Figure 53. Recommended Ankeny Hill Road/I-5 Interchange Event Egress Traffic Control.





Figure 54. Recommended Talbot Road/I-5 Northbound Ramps Event Egress Traffic Control.



Figure 55. Recommended Ankeny Hill Road/Wintel Road Event Egress Traffic Control.



## **TRAFFIC INCIDENT RESPONSE AND MANAGEMENT**

In discussions with Kendal Weeks, ODOT District 4 Assistant Manager, it is understood that ODOT will be involved with traffic management related to I-5. ODOT's utmost concern is for safety and to prevent queuing of vehicles on the I-5 shoulders as Festival attendees exit the freeway at the I-5/Ankeny Hill Road interchange and the I-5/Talbot Road interchange.

As part of the Temporary Traffic Control Plan, variable message signs will be located along I-5, both north and south of the Venue to alert attendees on the appropriate exit to use when arriving at the Festival.

ODOT will have Incident Response (IR) staff and vehicles patrolling I-5 during the Festival to identify any traffic and/or safety concerns. IR will call the Festival traffic management staff should issues on I-5 and the I-5 ramps need to be addressed and resolved. The Festival traffic management staff will be responsible for updating and revising the variable message signs on I-5 as appropriate.

In the event that an incident on an I-5 ramp necessitates alternate routing for use by IR, this study has identified two alternate routes. The first route incorporates Jefferson Highway 99E, from the I-5/Jefferson Highway Interchange to Ankeny Hill Road, then west on Ankeny Hill Road. A secondary alternate route utilizes Jefferson Highway 99E, from the I-5/Jefferson Highway Interchange to Talbot Road SE, then west on Talbot Road SE across I-5 (See Figure 56).

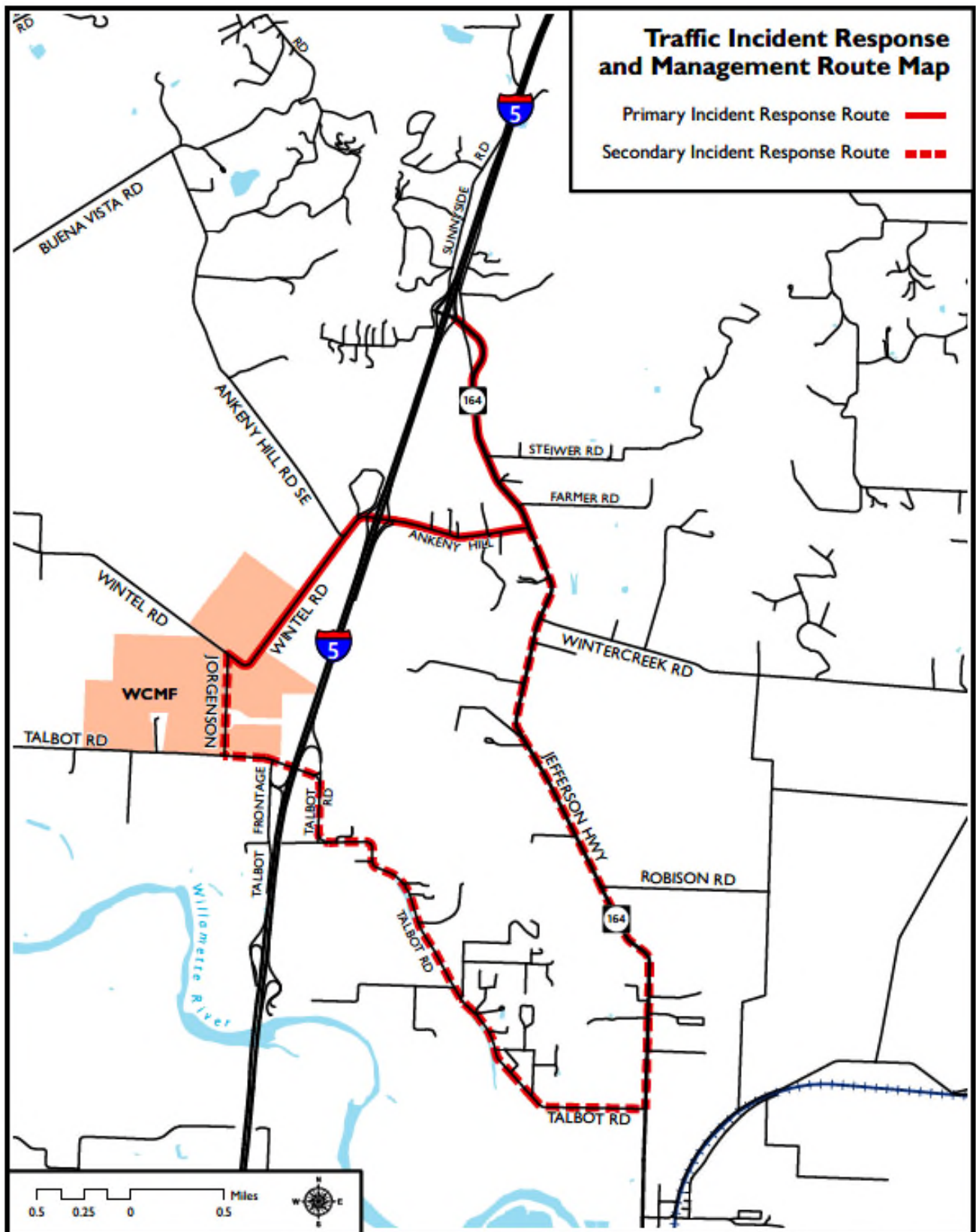


Figure 56. Traffic Incident Response and Management Route Map.

## **NEXT STEPS**

This analysis and temporary traffic control strategy has been provided to Marion County and ODOT staff for their review. We request another joint meeting between Marion County and ODOT staff to discuss these findings and recommendations and identify whether this addresses the critical concerns of the agencies. Pending agreement on this traffic study, additional discussions will need to occur prior to developing final traffic control plans for the WCMF event. Thank you for the continued coordination and data provided by ODOT and the County to assist in the preparation of the TIA and conceptual Temporary Traffic Control Plan.

## **ATTACHMENTS**

1. Evacuation Plan
2. Public Outreach
3. Traffic Counts
4. Seasonal Adjustment Factors
5. Trip Generation/Event Data
6. LOS Operational Analysis Worksheets



# ATTACHMENT 1

EVACUATION PLAN FOR WILLAMETTE COUNTRY MUSIC FESTIVAL

This evacuation plan is provided verbatim from the October 17, 2017 permit application.

1. In the event of an evacuation level emergency (extreme weather, wildfire, or high level bomb/public safety event) the decision to evacuate will be made jointly or singly (based upon which of these people are on the festival grounds and responsive to the situation, although all must be given notice by phone or text immediately even if not responded to) by the WCMC President, Vice President or the Festival Operations Coordinator in consultation with the OC, designated United Brown staging supervisor and emergency responders. Assessment and decision must be made in a timely manner to assure public safety.
2. In the event of an emergency, all security and site crew (both on and off duty) will report to the Operations Manager at the Site Operations Office. The Security Team will:
  - a. Ensure that each specified area has been cleared
  - b. The public (guests and fans) are moving off the main site
  - c. Performance artists, crew and staff are moving off the main site
  - d. Maintain clear route access for emergency vehicles, including police, fire and ambulance
  - e. Form a line, directing the public in the correct direction, reminding them to be calm
  - f. Provide information to the public as it becomes available
3. The public will be asked to calmly make their way off the main concert venue grounds and toward the GA parking field or area designated by the OC.
4. No vehicle movement is authorized for any reason. No one will be allowed to vacate the festival premises in a vehicle until the all-clear has been given by the OC.
5. The Public will be allowed to wait in the GA parking field and may utilize their vehicles for shelter in the event of severe weather, if not directed elsewhere by the OC.
6. In the event of severe injury:
  - a. The onsite First Aid Team will be called upon to deal with the injured person(s).
  - b. The ambulance service will be contacted immediately.
  - c. The person(s) will be stabilized before being moved if there is an immediate threat to their safety and to that of the First Aid team.
  - d. Only the authorized First Aid Team is authorized to make medical decisions on treatment and/or movement of an injured person.
7. If time allows, the following people will ensure all the electrical equipment has been shut down:
  - a. Site Personnel Lead Person
  - b. Contracted electrical distribution personnel However, the safety of all crew must be taken into account at all times. In the event of a fire, no one will be allowed to re-enter the area until the all-clear has been given by the fire department.
8. Once the situation is under control, the OC in conjunction with the LO and the WCMC President will determine if the event can continue or if an entire evacuation will be necessary.
  - a. If the event is stopped altogether and an entire evacuation is deemed necessary, site personnel will begin the process of evacuating the event site, under the supervision of the OC. Site personnel, in conjunction with security staff and designated deputy officials will begin the process of traffic management to facilitate evacuation of the site.

- b. If an emergency situation happens during the night, Deputy Officials on site will determine if evacuation would be more suitable during daylight hours, keeping in mind that many site workers will not be present during the overnight hours.
  - c. Each field will be cleared one at a time, starting with the main GA parking field. Exit will follow the established traffic control plan for the festival (attached).
- 9. A de-brief will be conducted after the Festival with the deputy and relevant authorities and will include all designated WCMC staff deemed necessary by the President or Operations Manager. Bi-Mart representatives are invited to participate in all after action de-briefs.
- 10. WCMC designated personnel will provide press releases as necessary and schedule interviews when convenient to the designated staff. No press will be allowed on the premises during the evacuation process.
- 11. All situations, both emergency and non-emergency, require notification of the Bi-Mart representative listed above in paragraph IV of this document. Although notification of said representatives is a requirement, press releases or other communications to external media are restricted to designated WCMC personnel.

Where the Liaison Officer (LO), who is an employee of WCMC, LLC, in consultation with the Operational Commander (OC).



# ATTACHMENT 2

PUBLIC OUTREACH

## PUBLIC OUTREACH

Additional information was obtained by the team through the individual letters, phone calls, and interviews that were provided to property owners, and public meetings. The purpose of these outreach efforts was to understand farming, food processing, and business operations to inform the selection of detour routes. As much of this information is personal, contains names, addresses, and other identifying information, or relates to personal businesses, this information has not been included within this report. Further, the transportation team did not obtain permission to make this personal or attributable information public. Key elements of the public outreach and findings are summarized within the Public Outreach section of the report. If additional information is needed the team can provide these details under separate cover but would first work with the property and business owners to obtain permission following their review of the materials.

# ATTACHMENT 3

## TRAFFIC COUNTS



































	Liberty/Ankeny	Buena Vista/Wintel	Buena Vista/Ankeny	Ankeny/Wintel	Ankeny/Wintel	Wintel/Buena Vista	Wintel/Jorgenson	Wintel/Ankeny	Mariatt/Talbot	Talbot/Mariatt	Total		
12:00 AM	1	0	2	4	5	2	1	1	0	0	16	0%	
1:00 AM	3	0	4	5	5	1	2	0	0	0	20	0%	
2:00 AM	0	0	0	3	3	0	0	0	1	0	7	0%	
3:00 AM	2	1	4	6	6	2	2	0	2	1	26	0%	
4:00 AM	0	1	4	16	17	3	3	1	1	0	46	1%	
5:00 AM	7	5	22	36	42	7	11	8	4	2	144	2%	
6:00 AM	22	7	39	76	94	11	14	16	14	14	307	5%	
7:00 AM	22	4	24	108	134	14	44	24	29	12	415	6%	
8:00 AM	21	9	37	60	92	12	25	32	50	13	351	5%	
9:00 AM	30	14	28	60	88	15	45	28	41	12	361	6%	
10:00 AM	34	14	37	52	86	17	57	26	34	20	377	6%	
11:00 AM	18	14	36	62	84	14	52	31	32	27	370	6%	
12:00 PM	39	6	34	78	105	16	54	26	23	12	393	6%	
1:00 PM	28	19	35	62	89	16	58	33	28	26	394	6%	
2:00 PM	42	23	53	67	87	13	63	22	74	20	464	7%	
3:00 PM	43	22	46	99	118	18	63	17	89	39	554	9%	
4:00 PM	53	18	63	140	160	12	54	20	23	20	563	9%	
5:00 PM	42	19	48	146	159	13	22	19	14	16	498	8%	
6:00 PM	44	14	43	82	98	22	24	16	22	27	392	6%	
7:00 PM	26	8	28	56	62	8	10	7	4	12	221	3%	
8:00 PM	29	14	38	46	52	10	10	9	6	14	228	4%	
9:00 PM	17	1	18	26	29	3	6	6	18	5	129	2%	
10:00 PM	5	2	10	11	15	7	11	6	3	4	74	1%	23%
11:00 PM	6	3	6	9	13	1	1	4	1	0	44	1%	13%

**ATTACHMENT 4**  
SEASONAL ADJUSTMENT FACTORS

8/3	Wed	669	502	457	539	889	2107	3406	4459	3958	4039	4234	4394	4667	4654	4965	5039	5598	5179	4124	3103	2515	2055	1498	984	74034
8/4	Thu	665	486	462	535	931	2113	3398	4416	3916	3949	4484	4716	4818	5075	5235	5373	5391	5494	4437	3543	2662	2216	1762	1106	77183
8/5	Fri	723	555	480	576	931	1956	3112	4045	3938	4383	4933	5434	5542	5719	5715	5855	5826	5859	4888	4088	3579	2699	1940	1215	83991
8/6	Sat	789	537	419	432	652	1056	1712	2516	3558	4491	5179	5406	5074	5108	5141	5174	5108	4781	4087	3390	3026	2778	2010	1495	73919
8/7	Sun	944	525	412	359	428	667	1077	1639	2446	3468	4675	5237	5634	5442	5310	5528	5220	5215	4719	4031	3372	2520	1744	1022	71634
8/8	Mon	678	459	404	514	988	2130	3324	4325	3814	3968	4406	4597	4819	4764	4894	4816	5257	5407	3807	3046	2222	1783	1252	960	72634
8/9	Tue	606	434	461	520	894	1978	3443	4340	3913	3790	4112	4290	4426	4488	4565	4820	5371	5170	3921	3094	2376	1883	1416	926	71237
8/10	Wed	622	486	469	577	878	2024	3356	4450	3975	4063	4192	4456	4601	4725	5006	5200	5276	5313	4123	3153	2424	2025	1428	981	73803
8/11	Thu	692	553	444	576	928	2040	3300	4370	4039	4263	4720	4854	5063	5153	5265	5595	5570	5738	4564	3936	2861	2715	1669	1095	80003
8/12	Fri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8/13	Sat	800	578	507	503	542	1049	1771	2361	3495	4647	5250	5442	5126	4733	5126	5048	4922	4318	3501	3386	2922	2670	2046	1367	72110
8/14	Sun	851	557	427	325	429	651	1111	1567	2427	3659	4656	5224	5292	5217	5029	5044	4947	4390	4784	4414	3318	2803	2134	1237	70493
8/15	Mon	695	520	481	534	981	2172	3446	4381	4032	4308	4819	4960	4917	4804	4971	5098	5106	5139	3877	2840	2314	1918	1325	866	74504
8/16	Tue	635	470	404	534	885	2070	3346	4207	3833	3802	4144	4180	4336	4492	4563	4969	4994	5180	3773	2909	2460	1931	1344	925	70386
8/17	Wed	652	506	466	554	954	2068	3486	4145	3979	3878	4278	4330	4360	4477	4886	5053	5269	5174	4114	2902	2472	1961	1363	902	72229
8/18	Thu	670	561	523	582	932	2062	3399	4247	4006	4202	4422	4635	4886	5126	5096	5197	5229	5158	4150	3158	2598	2082	1542	980	75443
8/19	Fri	756	610	507	594	942	2018	3048	3930	3915	4334	4833	5088	5243	5488	5486	5293	5211	5498	4958	3678	2915	2500	1801	1247	79893
8/20	Sat	780	530	475	463	578	1021	1545	2340	3479	4360	4908	5401	5059	4903	4912	4951	4489	4181	3691	3134	2785	2508	2116	1498	70107
8/21	Sun	821	568	424	356	433	654	971	1519	2424	3486	4488	5291	5511	5042	4876	4708	4968	4691	4748	3984	3279	2584	1585	948	68359
8/22	Mon	657	488	430	515	948	2199	3422	4309	3891	3930	4267	4478	4652	4819	4850	4810	5095	5171	3860	2958	2355	1821	1279	854	72058
8/23	Tue	591	452	456	546	895	2038	3310	4306	3922	3899	4053	4172	4405	4491	4713	5005	5202	5240	3766	2901	2352	1841	1316	868	70740
8/24	Wed	620	454	436	607	910	2137	3461	4338	3817	3838	4141	4375	4511	4654	4917	5068	5345	5144	3790	2878	2541	1976	1359	934	72251
8/25	Thu	668	531	482	568	933	2081	3298	4416	4065	4141	4124	5102	4788	5059	5265	5347	5311	5241	3356	3236	2960	2656	1503	979	76110
8/26	Fri	770	646	541	562	925	1962	3109	3905	3985	4464	4738	5205	5315	5440	5656	5803	5833	5247	4876	3504	2754	3055	2551	1549	82395
8/27	Sat	981	581	515	465	578	1032	1570	2411	3406	4632	5145	5387	5235	5095	5224	5275	5231	4830	4090	3658	3152	2902	2042	1623	75060
8/28	Sun	943	630	381	349	400	625	997	1626	2402	3678	4565	5285	5640	4262	4921	5117	5170	4845	4454	3979	3332	2494	1684	1054	68833
8/29	Mon	598	464	422	486	984	2063	3425	4219	3600	3985	4058	4483	4448	4475	4775	4715	5361	5088	3842	2674	2186	1879	1325	825	70380
8/30	Tue	569	416	379	488	885	1975	3355	4203	3689	3741	3991	4148	4229	4266	4365	4856	5245	4983	3666	2861	2432	1931	1433	863	68969
8/31	Wed	569	445	457	543	909	2121	3357	4345	3843	3690	3936	4317	4477	4468	4766	5072	5425	5227	3824	3027	2395	1929	1454	937	71533
9/1	Thu	643	527	499	584	927	2047	3363	4388	3878	4098	4266	4536	4767	4798	5021	5432	5690	5554	4349	3491	2720	2288	1626	1081	76573
9/2	Fri	731	598	580	654	982	1854	2986	3911	3816	4248	4750	5254	5462	5696	5716	5744	6060	5952	5085	4360	3407	2810	2180	1524	84360
9/3	Sat	937	594	487	522	615	967	1472	2179	3635	5350	6101	5953	5881	5032	4641	4582	4740	4629	5001	4538	4005	2821	1887	1235	77804
9/4	Sun	757	424	342	278	362	534	902	1296	2128	3191	4203	4336	4715	4790	4835	4766	4741	4586	4034	3755	3201	2609	1892	1181	63858
9/5	Mon	697	498	329	373	439	769	1093	1394	2179	3086	4173	5004	5002	4962	5097	4849	4824	4598	4162	3573	3042	2244	1447	954	64788
9/6	Tue	560	400	378	520	907	2148	3405	4098	3860	3655	4016	4228	4157	4424	4163	4915	4993	4842	3553	2658	2196	1692	1137	778	67683
9/7	Wed	476	413	372	512	912	2015	3369	4194	3674	3761	3843	4075	4200	4093	4379	4693	5087	5065	3609	2659	2290	1844	1336	799	67670
9/8	Thu	583	467	423	558	831	2075	3476	4262	3813	3862	4081	4287	4231	4386	4436	4487	4949	5221	3974	3270	2648	1954	1393	823	70490
9/9	Fri	610	484	502	588	896	1972	3342	4129	3698	4037	4263	4843	4965	5291	5577	5746	5450	5728	4799	3878	3080	2280	1821	1281	79260
9/10	Sat	821	504	394	430	556	1030	1781	2457	3388	4117	4812	5405	5363	5587	5365	5447	5800	5219	4163	3048	2745	2347	2136	2655	75570
9/11	Sun	2623	749	371	356	415	684	1101	1647	2586	3447	4521	5085	5264	5412	5266	5249	5098	4942	4268	3605	2713	2004	1238	741	69385
9/12	Mon	539	395	343	496	904	2157	3493	4450	3605	3821	3859	4238	4245	4154	4422	4522	4820	4805	3340	2624	2020	1582	1099	770	66703
9/13	Tue	511	424	357	522	857	2025	3404	4334	3686	3809	3772	3953	4057	4122	4302	4625	5257	4849	3598	2739	2243	1567	1101	852	66966
9/14	Wed	586	491	429	554	955	2079	3429	4334	3726	3728	3862	4014	4207	4312	4717	4879	4959	4976	3774	2752	2263	1765	1241	773	68805
9/15	Thu	550	428	428	508	876	2084	3421	4329	3871	3939	4261	4275	4430	4702	4769	5244	5539	5233	3984	3017	2478	1990	1380	915	72651
9/16	Fri	658	559	460	580	861	1895	3244	4201	3738	3998	4569	4397	3905	5685	5500	5693	5727	5604	5153	4067	2952	2194	1864	1171	78675
9/17	Sat	777	564	395	442	562	1063	1524	2287	3376	4377	5334	5672	5663	5158	4873	4890	4759	4816	4710	3696	2868	2142	1567	988	72503
9/18	Sun	631	403	316	287	335	597	913	1934	2228	3532	4654	5051	5503	5773	5611	5693	5536	5145	4389	3751	2939	1967	1336	793	69317
9/19	Mon	521	381	346	485	872	2060	3506	4257	3603	3811	4012	4327	4264	4426	4566	5033	5021	4925	3542	2627	2066	1721	1153	727	68252
9/20	Tue	584	464	372	503	851	2013	3418	4283	3770	3623	3795	4152	4173	4237	4423	4953	5151	5056	3686	2774	2279	1699	1218	905	68382
9/21	Wed	687	564	458	547	899	2070	3485	4438	3905	3828	3858	4105	4033	4285	4576	4799	5447	5034	3999	2886	2238	1813	1198	806	69958
9/22	Thu	625	458	404	576	890	2003	3422	4428	3919	3932	4274	4548	4385	4472	4700	4944	5553	5334	4329	3124	2547	1918	1358	854	72997
9/23	Fri	596	506	457	555	826	1775	2901	4076	3619	3963	4344	4770	5051	5145	5463	5842	5976	5947	5056	3951	2999	2347	1873	1172	79210
9/24	Sat	776	5																							

# ATTACHMENT 4

## TRIP GENERATION/EVENT DATA



**Assumptions**

Maximum Attendance: 30000  
 Campers: 12000  
 GA Occupancy: 2.33  
 Camping Occupancy: 2.5

	Daily Use Trips				Event Arrival		Camping Trips		Daily Outing Camping		Total Event Trips	
	Arrival Day Trips		Departure Day Trips		Camping Trips		Event Departure		Trips		In	Out
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Thursday	6:00 a.m.	0		0	0						0	0
	7:00 a.m.	0		0	0						0	0
	8:00 a.m.	0		0	0						0	0
	9:00 a.m.	0		0	0						0	0
	10:00 a.m.	16		0	336						352	0
	11:00 a.m.	55		0	576						631	0
	12:00 p.m.	124		0	480						604	0
	1:00 p.m.	384		0	576						960	0
	2:00 p.m.	444		0	576						1020	0
	3:00 p.m.	767		0	720						1487	0
	4:00 p.m.	1115		55	720						1835	55
5:00 p.m.	1327		55	720						2047	55	
6:00 p.m.	721		55	48						769	55	
7:00 p.m.	423		55	48						471	55	
8:00 p.m.	123		277	0						123	277	
9:00 p.m.	51		4717	0						51	4717	
10:00 p.m.	1		333	0						1	333	
11:00 p.m.	0		0	0						0	0	
Friday	6:00 a.m.	0		0	0			2	46		2	46
	7:00 a.m.	0		0	0			7	65		7	65
	8:00 a.m.	0		0	0			48	192		48	192
	9:00 a.m.	0		0	0			180	420		180	420
	10:00 a.m.	22		0	0			144	216		166	216
	11:00 a.m.	74		0	0			67	101		141	101
	12:00 p.m.	166		0	0			180	180		346	180
	1:00 p.m.	518		0	0			72	48		590	48
	2:00 p.m.	597		0	0			17	7		614	7
	3:00 p.m.	1033		0	0			19	5		1052	5
	4:00 p.m.	1501		75	0			22	2		1523	77
5:00 p.m.	1787		75	0			108	12		1895	87	
6:00 p.m.	971		75	0			228	12		1199	87	
7:00 p.m.	569		75	0			0	0		569	75	
8:00 p.m.	165		75	0			0	0		165	75	
9:00 p.m.	68		374	0			0	0		68	374	
10:00 p.m.	1		5979	0			0	0		1	5979	
11:00 p.m.	0		747	0			0	0		0	747	
Saturday	6:00 a.m.	0		0	0			2	46		2	46
	7:00 a.m.	0		0	0			7	65		7	65
	8:00 a.m.	0		0	0			48	192		48	192
	9:00 a.m.	7		0	0			180	420		187	420
	10:00 a.m.	28		0	0			144	216		172	216
	11:00 a.m.	110		0	0			67	101		177	101
	12:00 p.m.	133		0	0			180	180		313	180
	1:00 p.m.	332		0	0			72	48		404	48
	2:00 p.m.	441		0	0			17	7		457	7
	3:00 p.m.	918		0	0			19	5		937	5
	4:00 p.m.	1540		77	0			22	2		1561	80
5:00 p.m.	2034		77	0			108	12		2142	89	
6:00 p.m.	1540		77	0			228	12		1768	89	
7:00 p.m.	441		77	0			0	0		441	77	
8:00 p.m.	147		77	0			0	0		147	77	
9:00 p.m.	55		386	0			0	0		55	386	
10:00 p.m.	0	100	6180	0			10	100		110	6280	
11:00 p.m.	0		773	0			0	0		0	773	
Sunday	6:00 a.m.	0		0	0			0	2	46	2	46
	7:00 a.m.	0		0	0			0	7	65	7	65
	8:00 a.m.	0		0	0			0	48	192	48	192
	9:00 a.m.	6		0	0			0	180	420	186	420
	10:00 a.m.	23		0	0			0	144	216	167	216
	11:00 a.m.	92		0	0			0	67	101	160	101
12:00 p.m.	112		0	0			0	180	180	292	180	

Sunday	1:00 p.m.	278		0	0		0	72	48	350	48
	2:00 p.m.	369		0	0		0	17	7	386	7
	3:00 p.m.	769		0	0		0	19	5	789	5
	4:00 p.m.	1291		65	0		0	22	2	1312	67
	5:00 p.m.	1705		65	0		0	108	12	1813	77
	6:00 p.m.	1291		65	0		0	228	12	1519	77
	7:00 p.m.	369		65	0		48	0	0	369	113
	8:00 p.m.	123		324	0		48	0	0	123	372
	9:00 p.m.	46		5504	0		240	0	0	46	5744
	10:00 p.m.	0		388	0		960	0	0	0	1348
	11:00 p.m.	0		0	0		480	0	0	0	480
Monday	6:00 a.m.	0		0	0		240			0	240
	7:00 a.m.	0		0	0		960			0	960
	8:00 a.m.	0		0	0		720			0	720
	9:00 a.m.	0		0	0		480			0	480
	10:00 a.m.	0		0	0		480			0	480
	11:00 a.m.	0		0	0		0			0	0
	12:00 p.m.	0		0	0		0			0	0
	1:00 p.m.	0		0	0		0			0	0
	2:00 p.m.	0		0	0		0			0	0
	3:00 p.m.	0		0	0		0			0	0
	4:00 p.m.	0		0	0		0			0	0
	5:00 p.m.	0		0	0		0			0	0
	6:00 p.m.	0		0	0		0			0	0
	7:00 p.m.	0		0	0		0			0	0
	8:00 p.m.	0		0	0		0			0	0
	9:00 p.m.	0		0	0		0			0	0
	10:00 p.m.	0		0	0		0			0	0
	11:00 p.m.	0		0	0		0			0	0

2017 Sunrise Stage

**Thursday (8/17)**

5pm Sammy Arriaga  
7pm Carlton Anderson

**Friday (8/18)**

9am Scott Stevens  
  
11am Haley & Michaels  
1pm Ben Rue  
4pm Spencer Crandall  
6pm Nick Wayne

**Saturday (8/19)**

9am Brodie Stewart  
Deborah Allen w/Brewers Grade  
  
11am  
2pm Dylan Schneider  
4pm Morgan Evans  
6pm Devin Dawson

**Sunday (8/20)**

9am Cowboy Church/Amy Clawson  
11am Kelsey Waters  
Jo Smith  
  
1pm  
3pm Cross Atlantic  
5pm Austin Burke



PRESENTED BY  Keeps You Moving

**Thursday (7/27)**

3PM - GATES

4pm - Bailey Bryan

6pm Kane Brown

8pm - Jake Owen

**Friday (7/28)**

1PM - GATES

3pm - Smithfield

5pm - William Michael Morgan

6:45pm Opening Ceremony

7pm - Brett Eldredge

2018 Headliner Video

9pm - Luke Bryan

**Saturday (7/29) TIMBER PRODUCTS**

11AM - GATES

1pm - Jackie Lee

3pm - Josh Abbott Band

5pm - Maddie & Tae

7pm - Lee Brice

9pm - Stapleton

**Sunday (7/30) COSMOS**

NOON - GATES

2pm - Jackson Michelson

4pm - Dan & Shay

6pm - Billy Currington

8pm - Keith Urban

**Thursday (7/27)**

4PM - GATES

6PM - TWILIGHT CONCERT

**Friday (7/28)**

3PM - GATES

5pm - Kane Brown

7pm - Dan & Shay

8:45pm Opening Ceremony

9pm - Billy Currington

TBD - 2018 Headliner Video

11pm - Keith Urban

**Saturday (7/29)**

1PM - GATES

3pm - Ashley McBryde

5pm - William Michael Morgan

7pm - Eric Paslay

9pm - Brett Eldredge

11pm - Luke Bryan

**Sunday (7/30)**

2PM GATES

4pm - Josh Abbott Band

6pm - Maddie & Tae

8pm - Lee Brice

10pm - Stapleton

**Thursday (8/17)**

3PM - GATES

4pm - Jackie Lee

6pm - Parmalee

8pm - Thomas Rhett

**Friday (8/18)**

1PM - GATES

3pm - High Valley

5pm - Colt Ford

6:45pm Opening Ceremony

7pm - Randy Houser

2018 Headliner Video

9pm - Dierks Bentley

**Saturday (8/19)**

11:00AM - GATES

1pm - Bailey Bryan

3pm - Jackson Michelson

5pm - RaeLynn

7pm - Billy Currington

9pm - Keith Urban

**Sunday (8/20) COSMOS**

NOON - GATES

2pm - Amy Clawson

4pm - Sundance Head

6pm - Kip Moore

8pm - Zac Brown Band

# ATTACHMENT 5

## LOS OPERATIONAL ANALYSIS WORKSHEETS



Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	17	39	20	186	34	15
Future Vol, veh/h	17	39	20	186	34	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	5	0	0	0
Mvmt Flow	18	41	21	196	36	16

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	59	0	277
Stage 1	-	-	-	-	39
Stage 2	-	-	-	-	238
Critical Hdwy	-	-	4.15	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.245	-	3.5
Pot Cap-1 Maneuver	-	-	1526	-	717
Stage 1	-	-	-	-	989
Stage 2	-	-	-	-	806
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1526	-	706
Mov Cap-2 Maneuver	-	-	-	-	706
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	806

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1017	-	-	1526	-
HCM Lane V/C Ratio	0.051	-	-	0.014	-
HCM Control Delay (s)	8.7	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection												
Int Delay, s/veh	8.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻						↻↻	
Traffic Vol, veh/h	0	19	15	15	19	1	0	0	1	207	1	13
Future Vol, veh/h	0	19	15	15	19	1	0	0	1	207	1	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	20	16	16	20	1	0	0	1	218	1	14

Major/Minor	Major1			Major2			Minor2			
Conflicting Flow All	-	0	0	36	0	0		81	89	21
Stage 1	-	-	-	-	-	-		53	53	-
Stage 2	-	-	-	-	-	-		28	36	-
Critical Hdwy	-	-	-	4.1	-	-		6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-		5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-		5.4	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-		3.5	4	3.3
Pot Cap-1 Maneuver	0	-	-	1588	-	-		926	805	1062
Stage 1	0	-	-	-	-	-		975	855	-
Stage 2	0	-	-	-	-	-		1000	869	-
Platoon blocked, %	-	-	-	-	-	-		-	-	-
Mov Cap-1 Maneuver	-	-	-	1588	-	-		917	0	1062
Mov Cap-2 Maneuver	-	-	-	-	-	-		917	0	-
Stage 1	-	-	-	-	-	-		965	0	-
Stage 2	-	-	-	-	-	-		1000	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.1	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	1588	-	-	924
HCM Lane V/C Ratio	-	-	0.01	-	-	0.252
HCM Control Delay (s)	-	-	7.3	-	-	10.2
HCM Lane LOS	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	-	0	-	-	1

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔				
Traffic Vol, veh/h	6	222	0	0	22	92	14	1	22	0	0	0
Future Vol, veh/h	6	222	0	0	22	92	14	1	22	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	234	0	0	23	97	15	1	23	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	120	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1480	0	0
Stage 1	-	0	0
Stage 2	-	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1480	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	0	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	752	1480	-	-	-
HCM Lane V/C Ratio	0.052	0.004	-	-	-
HCM Control Delay (s)	10	7.4	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.2	0	-	-	-

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	20	216	90	13	35	20
Future Vol, veh/h	20	216	90	13	35	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	21	227	95	14	37	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	109	0	-	0	371
Stage 1	-	-	-	-	102
Stage 2	-	-	-	-	269
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1494	-	-	-	634
Stage 1	-	-	-	-	927
Stage 2	-	-	-	-	781
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1494	-	-	-	624
Mov Cap-2 Maneuver	-	-	-	-	624
Stage 1	-	-	-	-	912
Stage 2	-	-	-	-	781

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1494	-	-	-	715
HCM Lane V/C Ratio	0.014	-	-	-	0.081
HCM Control Delay (s)	7.4	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	20	26	4	36	197	22
Future Vol, veh/h	20	26	4	36	197	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	21	27	4	38	207	23

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	265	219	230	0	0
Stage 1	219	-	-	-	-
Stage 2	46	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	728	826	1350	-	-
Stage 1	822	-	-	-	-
Stage 2	982	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	726	826	1350	-	-
Mov Cap-2 Maneuver	726	-	-	-	-
Stage 1	820	-	-	-	-
Stage 2	982	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1350	-	779	-	-
HCM Lane V/C Ratio	0.003	-	0.062	-	-
HCM Control Delay (s)	7.7	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-



Intersection												
Int Delay, s/veh	145.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗			↖						↕	
Traffic Vol, veh/h	0	59	40	8	134	0	0	0	0	6	2	1045
Future Vol, veh/h	0	59	40	8	134	0	0	0	0	6	2	1045
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	3	0	0	0	0	0	0	0	0	35
Mvmt Flow	0	62	42	8	141	0	0	0	0	6	2	1100

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	-	0	0	104	0	0			240	261	141
Stage 1	-	-	-	-	-	-			157	157	-
Stage 2	-	-	-	-	-	-			83	104	-
Critical Hdwy	-	-	-	4.1	-	-			6.4	6.5	6.55
Critical Hdwy Stg 1	-	-	-	-	-	-			5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.4	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-			3.5	4	3.615
Pot Cap-1 Maneuver	0	-	-	1500	-	0			753	647	~ 826
Stage 1	0	-	-	-	-	0			876	772	-
Stage 2	0	-	-	-	-	0			945	813	-
Platoon blocked, %		-	-	-	-	-					
Mov Cap-1 Maneuver	-	-	-	1500	-	-			748	0	~ 826
Mov Cap-2 Maneuver	-	-	-	-	-	-			748	0	-
Stage 1	-	-	-	-	-	-			871	0	-
Stage 2	-	-	-	-	-	-			945	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.4	178.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1500	-	826
HCM Lane V/C Ratio	-	-	0.006	-	1.342
HCM Control Delay (s)	-	-	7.4	0	178.8
HCM Lane LOS	-	-	A	A	F
HCM 95th %tile Q(veh)	-	-	0	-	44.6

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

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	39	25	0	0	104	7	37	1	16	0	0	0
Future Vol, veh/h	39	25	0	0	104	7	37	1	16	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	41	26	0	0	109	7	39	1	17	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	116	0	26
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	2.2
Pot Cap-1 Maneuver	1485	0	1601
Stage 1	-	0	-
Stage 2	-	0	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1485	-	1601
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	4.6	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR
Capacity (veh/h)	822	1485	-	1601	-	-
HCM Lane V/C Ratio	0.069	0.028	-	-	-	-
HCM Control Delay (s)	9.7	7.5	0	0	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	0.1	-	0	-	-

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	7	36	83	103	246	29
Future Vol, veh/h	7	36	83	103	246	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	38	87	108	259	31

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	557	275	290	0	0
Stage 1	275	-	-	-	-
Stage 2	282	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	495	769	1283	-	-
Stage 1	776	-	-	-	-
Stage 2	770	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	459	769	1283	-	-
Mov Cap-2 Maneuver	459	-	-	-	-
Stage 1	720	-	-	-	-
Stage 2	770	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	3.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1283	-	693	-	-
HCM Lane V/C Ratio	0.068	-	0.065	-	-
HCM Control Delay (s)	8	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

**Intersection**

Int Delay, s/veh 161.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	4	149	1109	4	14	33
Future Vol, veh/h	4	149	1109	4	14	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	35	50	12	0
Mvmt Flow	4	157	1167	4	15	35

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	161	0	2421
Stage 1	-	-	-	-	83
Stage 2	-	-	-	-	2338
Critical Hdwy	-	-	4.45	-	6.52
Critical Hdwy Stg 1	-	-	-	-	5.52
Critical Hdwy Stg 2	-	-	-	-	5.52
Follow-up Hdwy	-	-	2.515	-	3.608
Pot Cap-1 Maneuver	-	-	1240	-	33
Stage 1	-	-	-	-	916
Stage 2	-	-	-	-	72
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1240	-	~ 2
Mov Cap-2 Maneuver	-	-	-	-	~ 2
Stage 1	-	-	-	-	52
Stage 2	-	-	-	-	72

Approach	EB	WB	NB
HCM Control Delay, s	0	32.1	\$ 3755.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	7	-	-	1240	-
HCM Lane V/C Ratio	7.068	-	-	0.941	-
HCM Control Delay (s)	\$ 3755.2	-	-	32.2	0
HCM Lane LOS	F	-	-	D	A
HCM 95th %tile Q(veh)	7.7	-	-	16.9	-

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

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	85	4	254	469	18	0
Future Vol, veh/h	85	4	254	469	18	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	60	0	0	0
Mvmt Flow	89	4	267	494	19	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	761	0	0	696	514
Stage 1	-	-	-	514	-
Stage 2	-	-	-	182	-
Critical Hdwy	4.1	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	3.5	3.3
Pot Cap-1 Maneuver	860	-	-	411	564
Stage 1	-	-	-	605	-
Stage 2	-	-	-	854	-
Platoon blocked, %		-	-		
Mov Cap-1 Maneuver	860	-	-	368	564
Mov Cap-2 Maneuver	-	-	-	368	-
Stage 1	-	-	-	542	-
Stage 2	-	-	-	854	-

Approach	EB	WB	SB
HCM Control Delay, s	9.2	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	860	-	-	-	368
HCM Lane V/C Ratio	0.104	-	-	-	0.051
HCM Control Delay (s)	9.7	0	-	-	15.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	0.2



Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	14	38	15	741	9	37
Future Vol, veh/h	14	38	15	741	9	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	5	0	33	0	0
Mvmt Flow	15	40	16	780	9	39

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	55	0	847 35
Stage 1	-	-	-	-	35 -
Stage 2	-	-	-	-	812 -
Critical Hdwy	-	-	4.1	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.2	-	3.5 3.3
Pot Cap-1 Maneuver	-	-	1563	-	335 1044
Stage 1	-	-	-	-	993 -
Stage 2	-	-	-	-	440 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1563	-	329 1044
Mov Cap-2 Maneuver	-	-	-	-	329 -
Stage 1	-	-	-	-	975 -
Stage 2	-	-	-	-	440 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	733	-	-	1563	-
HCM Lane V/C Ratio	0.066	-	-	0.01	-
HCM Control Delay (s)	10.3	-	-	7.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	44	2	2	49	4
Future Vol, veh/h	1	44	2	2	49	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	Free	-	Yield	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	3	0
Mvmt Flow	1	46	2	2	52	4

Major/Minor	Minor2	Major2			
Conflicting Flow All	108	4	0	0	
Stage 1	108	-	-	-	
Stage 2	0	-	-	-	
Critical Hdwy	6.5	6.2	4.13	-	
Critical Hdwy Stg 1	5.5	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	
Follow-up Hdwy	4	3.3	2.227	-	
Pot Cap-1 Maneuver	786	1085	-	-	
Stage 1	810	-	-	-	
Stage 2	-	-	-	-	
Platoon blocked, %					
Mov Cap-1 Maneuver	0	1085	-	-	
Mov Cap-2 Maneuver	0	-	-	-	
Stage 1	0	-	-	-	
Stage 2	0	-	-	-	

Approach	NB	SB
HCM Control Delay, s	6.7	
HCM LOS	A	

Minor Lane/Major Mvmt	NBLn1	SBL	SBT
Capacity (veh/h)	2170	-	-
HCM Lane V/C Ratio	0.002	-	-
HCM Control Delay (s)	6.7	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection						
Int Delay, s/veh	18.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	8	42	62	11	14	694
Future Vol, veh/h	8	42	62	11	14	694
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	Stop	-	Stop
Storage Length	50	-	-	50	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	5	0	0	33
Mvmt Flow	8	44	65	12	15	731

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	65	0	-	0	125 65
Stage 1	-	-	-	-	65 -
Stage 2	-	-	-	-	60 -
Critical Hdwy	4.1	-	-	-	6.4 6.53
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.597
Pot Cap-1 Maneuver	1550	-	-	-	875 919
Stage 1	-	-	-	-	963 -
Stage 2	-	-	-	-	968 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1550	-	-	-	871 919
Mov Cap-2 Maneuver	-	-	-	-	871 -
Stage 1	-	-	-	-	958 -
Stage 2	-	-	-	-	968 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	21.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1550	-	-	-	871	919
HCM Lane V/C Ratio	0.005	-	-	-	0.017	0.795
HCM Control Delay (s)	7.3	-	-	-	9.2	22.2
HCM Lane LOS	A	-	-	-	A	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1	8.5

Intersection						
Int Delay, s/veh	12.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	25	8	12	1	129	558
Future Vol, veh/h	25	8	12	1	129	558
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	5	0	0	0
Mvmt Flow	25	8	12	1	129	558

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	33	0	54 29
Stage 1	-	-	-	-	29 -
Stage 2	-	-	-	-	25 -
Critical Hdwy	-	-	4.15	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.245	-	3.5 3.3
Pot Cap-1 Maneuver	-	-	1560	-	959 1052
Stage 1	-	-	-	-	999 -
Stage 2	-	-	-	-	1003 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1560	-	951 1052
Mov Cap-2 Maneuver	-	-	-	-	951 -
Stage 1	-	-	-	-	991 -
Stage 2	-	-	-	-	1003 -

Approach	EB	WB	NB
HCM Control Delay, s	0	6.8	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1119	-	-	1560	-
HCM Lane V/C Ratio	0.614	-	-	0.008	-
HCM Control Delay (s)	13.2	-	-	7.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	4.4	-	-	0	-

Intersection												
Int Delay, s/veh	7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻						↻↻	
Traffic Vol, veh/h	0	3	2	2	3	0	0	0	0	31	0	2
Future Vol, veh/h	0	3	2	2	3	0	0	0	0	31	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	3	2	2	3	0	0	0	0	31	0	2

Major/Minor	Major1			Major2			Minor2			
Conflicting Flow All	-	0	0	5	0	0		11	12	3
Stage 1	-	-	-	-	-	-		7	7	-
Stage 2	-	-	-	-	-	-		4	5	-
Critical Hdwy	-	-	-	4.1	-	-		6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-		5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-		5.4	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-		3.5	4	3.3
Pot Cap-1 Maneuver	0	-	-	1630	-	-		1014	887	1087
Stage 1	0	-	-	-	-	-		1021	894	-
Stage 2	0	-	-	-	-	-		1024	896	-
Platoon blocked, %	-	-	-	-	-	-		-	-	-
Mov Cap-1 Maneuver	-	-	-	1630	-	-		1013	0	1087
Mov Cap-2 Maneuver	-	-	-	-	-	-		1013	0	-
Stage 1	-	-	-	-	-	-		1020	0	-
Stage 2	-	-	-	-	-	-		1024	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.9	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	1630	-	-	1017
HCM Lane V/C Ratio	-	-	0.001	-	-	0.032
HCM Control Delay (s)	-	-	7.2	-	-	8.7
HCM Lane LOS	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	-	0	-	-	0.1



Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔				
Traffic Vol, veh/h	1	33	0	0	3	14	2	0	3	0	0	0
Future Vol, veh/h	1	33	0	0	3	14	2	0	3	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	33	0	0	3	14	2	0	3	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	17	0	45
Stage 1	-	-	35
Stage 2	-	-	10
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1613	0	970
Stage 1	-	0	993
Stage 2	-	0	1018
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1613	-	969
Mov Cap-2 Maneuver	-	-	969
Stage 1	-	-	992
Stage 2	-	-	1018

Approach	EB	WB	NB
HCM Control Delay, s	0.2	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1014	1613	-	-	-
HCM Lane V/C Ratio	0.005	0.001	-	-	-
HCM Control Delay (s)	8.6	7.2	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	0	-	-	-

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	3	32	13	2	5	3
Future Vol, veh/h	3	32	13	2	5	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	32	13	2	5	3

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	15	0	-	0	52 14
Stage 1	-	-	-	-	14 -
Stage 2	-	-	-	-	38 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1616	-	-	-	962 1072
Stage 1	-	-	-	-	1014 -
Stage 2	-	-	-	-	990 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1616	-	-	-	960 1072
Mov Cap-2 Maneuver	-	-	-	-	960 -
Stage 1	-	-	-	-	1012 -
Stage 2	-	-	-	-	990 -

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1616	-	-	-	999
HCM Lane V/C Ratio	0.002	-	-	-	0.008
HCM Control Delay (s)	7.2	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	2	1	3	24	2	126
Future Vol, veh/h	2	1	3	24	2	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	1	3	24	2	126

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	95	65	128	0	0
Stage 1	65	-	-	-	-
Stage 2	30	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	909	1005	1470	-	-
Stage 1	963	-	-	-	-
Stage 2	998	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	907	1005	1470	-	-
Mov Cap-2 Maneuver	907	-	-	-	-
Stage 1	961	-	-	-	-
Stage 2	998	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1470	-	937	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s)	7.5	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	1514					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	9	11	680	3462	62	10
Future Vol, veh/h	9	11	680	3462	62	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	0	0	0	25	0
Mvmt Flow	9	11	680	3462	62	10

Major/Minor	Minor2	Major2		
Conflicting Flow All	67	67	-	0
Stage 1	67	67	-	-
Stage 2	0	0	-	-
Critical Hdwy	6.4	6.5	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.5	4	-	-
Pot Cap-1 Maneuver	943	~ 828	-	-
Stage 1	961	~ 843	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	943	0	-	-
Mov Cap-2 Maneuver	943	0	-	-
Stage 1	961	0	-	-
Stage 2	-	0	-	-

Approach	NB	SB
HCM Control Delay, s	\$ 1540.3	0
HCM LOS	F	

Minor Lane/Major Mvmt	NBLn1	SBT	SBR
Capacity (veh/h)	943	-	-
HCM Lane V/C Ratio	4.392	-	-
HCM Control Delay (s)	\$ 1540.3	-	-
HCM Lane LOS	F	-	-
HCM 95th %tile Q(veh)	403.7	-	-

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

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻						↻	
Traffic Vol, veh/h	0	3465	6	1	14	0	0	0	0	1	0	58
Future Vol, veh/h	0	3465	6	1	14	0	0	0	0	1	0	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	0	0	0	0	0	0	0	0	10
Mvmt Flow	0	3465	6	1	14	0	0	0	0	1	0	58

Major/Minor	Major1			Major2			Minor2			
Conflicting Flow All	-	0	0	3471	0	0		3484	3487	14
Stage 1	-	-	-	-	-	-		16	16	-
Stage 2	-	-	-	-	-	-		3468	3471	-
Critical Hdwy	-	-	-	4.1	-	-		6.4	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-		5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-		5.4	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-		3.5	4	3.39
Pot Cap-1 Maneuver	0	-	-	76	-	0		7	7	1043
Stage 1	0	-	-	-	-	0		1012	886	-
Stage 2	0	-	-	-	-	0		20	18	-
Platoon blocked, %	-	-	-	-	-	-		-	-	-
Mov Cap-1 Maneuver	-	-	-	76	-	-		7	0	1043
Mov Cap-2 Maneuver	-	-	-	-	-	-		7	0	-
Stage 1	-	-	-	-	-	-		999	0	-
Stage 2	-	-	-	-	-	-		20	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.5	20.1
HCM LOS			C

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	76	-	297
HCM Lane V/C Ratio	-	-	0.013	-	0.199
HCM Control Delay (s)	-	-	53	0	20.1
HCM Lane LOS	-	-	F	A	C
HCM 95th %tile Q(veh)	-	-	0	-	0.7



Intersection												
Int Delay, s/veh	373											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	3092	374	0	0	10	1	5	0	2	0	0	0
Future Vol, veh/h	3092	374	0	0	10	1	5	0	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3092	374	0	0	10	1	5	0	2	0	0	0

Major/Minor	Major1		Major2		Minor1				
Conflicting Flow All	11	0	-	374	0	0	6569	6569	374
Stage 1	-	-	-	-	-	-	6558	6558	-
Stage 2	-	-	-	-	-	-	11	11	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver ~ 1621	-	-	0	1196	-	-	0	0	677
Stage 1	-	-	0	-	-	-	0	0	-
Stage 2	-	-	0	-	-	-	1017	890	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver ~ 1621	-	-	-	1196	-	-	0	0	677
Mov Cap-2 Maneuver	-	-	-	-	-	-	0	0	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	1017	0	-

Approach	EB	WB	NB
HCM Control Delay, s	374.9	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR
Capacity (veh/h)	677 ~ 1621	-	1196	-	-	-
HCM Lane V/C Ratio	0.01	1.907	-	-	-	-
HCM Control Delay (s)	10.4	420.2	0	0	-	-
HCM Lane LOS	B	F	A	A	-	-
HCM 95th %tile Q(veh)	0	190	-	0	-	-

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

Intersection						
Int Delay, s/veh	9.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	125	252	8	20	34	2
Future Vol, veh/h	125	252	8	20	34	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	125	252	8	20	34	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	71	35	36	0	0
Stage 1	35	-	-	-	-
Stage 2	36	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	938	1044	1588	-	-
Stage 1	993	-	-	-	-
Stage 2	992	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	933	1044	1588	-	-
Mov Cap-2 Maneuver	933	-	-	-	-
Stage 1	988	-	-	-	-
Stage 2	992	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1588	-	1004	-	-
HCM Lane V/C Ratio	0.005	-	0.375	-	-
HCM Control Delay (s)	7.3	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.8	-	-

Intersection						
Int Delay, s/veh	1253					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	1	1	73	1	1	4141
Future Vol, veh/h	1	1	73	1	1	4141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	50	12	0
Mvmt Flow	1	1	73	1	1	4141

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	2	0	149 2
Stage 1	-	-	-	-	2 -
Stage 2	-	-	-	-	147 -
Critical Hdwy	-	-	4.1	-	6.52 6.2
Critical Hdwy Stg 1	-	-	-	-	5.52 -
Critical Hdwy Stg 2	-	-	-	-	5.52 -
Follow-up Hdwy	-	-	2.2	-	3.608 3.3
Pot Cap-1 Maneuver	-	-	1634	-	820~ 1088
Stage 1	-	-	-	-	996 -
Stage 2	-	-	-	-	857 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1634	-	783~ 1088
Mov Cap-2 Maneuver	-	-	-	-	783 -
Stage 1	-	-	-	-	951 -
Stage 2	-	-	-	-	857 -

Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	\$ 1275.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1088	-	-	1634	-
HCM Lane V/C Ratio	3.807	-	-	0.045	-
HCM Control Delay (s)	\$ 1275.9	-	-	7.3	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	385.8	-	-	0.1	-

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

**Intersection**

Int Delay, s/veh 587.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	1	1	1	37	2262	28
Future Vol, veh/h	1	1	1	37	2262	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	50	0	0	0
Mvmt Flow	1	1	1	37	2262	28

**Major/Minor**

	Major1	Major2	Minor2		
Conflicting Flow All	38	0	-	0	23
Stage 1	-	-	-	-	20
Stage 2	-	-	-	-	3
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1585	-	-	-	~ 998
Stage 1	-	-	-	-	~ 1008
Stage 2	-	-	-	-	~ 1025
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1585	-	-	-	~ 997
Mov Cap-2 Maneuver	-	-	-	-	~ 997
Stage 1	-	-	-	-	~ 1007
Stage 2	-	-	-	-	~ 1025

**Approach**

	EB	WB	SB
HCM Control Delay, s	3.6	0	\$ 597.5
HCM LOS			F

**Minor Lane/Major Mvmt**

	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1585	-	-	-	998
HCM Lane V/C Ratio	0.001	-	-	-	2.295
HCM Control Delay (s)	7.3	0	-	-	\$ 597.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	166.7

**Notes**

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

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	142	2125	2	40	1	5
Future Vol, veh/h	142	2125	2	40	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	5	0	9	0	0
Mvmt Flow	142	2125	2	40	1	5

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	2267	0	1249
Stage 1	-	-	-	-	1205
Stage 2	-	-	-	-	44
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	229	-	193
Stage 1	-	-	-	-	286
Stage 2	-	-	-	-	984
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	229	-	191
Mov Cap-2 Maneuver	-	-	-	-	191
Stage 1	-	-	-	-	283
Stage 2	-	-	-	-	984

Approach	EB	WB	NB
HCM Control Delay, s	0	1	21.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	219	-	-	229	-
HCM Lane V/C Ratio	0.027	-	-	0.009	-
HCM Control Delay (s)	21.9	-	-	20.9	0
HCM Lane LOS	C	-	-	C	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	7	0	0	2127	1
Future Vol, veh/h	0	7	0	0	2127	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	Free	-	Yield	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	3	0
Mvmt Flow	0	7	0	0	2127	1

Major/Minor	Minor2	Major2		
Conflicting Flow All	4255	1	0	0
Stage 1	4255	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.5	6.2	4.13	-
Critical Hdwy Stg 1	5.5	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4	3.3	2.227	-
Pot Cap-1 Maneuver	2	1090	-	-
Stage 1	6	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1090	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	NB	SB
HCM Control Delay, s	0	
HCM LOS	A	

Minor Lane/Major Mvmt	NBLn1	SBL	SBT
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	0	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	-	-	-

Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	126	21	4	2	2	39
Future Vol, veh/h	126	21	4	2	2	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	Stop	-	Stop
Storage Length	50	-	-	50	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	5	0	0	6
Mvmt Flow	126	21	4	2	2	39

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	4	0	-	0	277 4
Stage 1	-	-	-	-	4 -
Stage 2	-	-	-	-	273 -
Critical Hdwy	4.1	-	-	-	6.4 6.26
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.354
Pot Cap-1 Maneuver	1631	-	-	-	717 1068
Stage 1	-	-	-	-	1024 -
Stage 2	-	-	-	-	778 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1631	-	-	-	662 1068
Mov Cap-2 Maneuver	-	-	-	-	662 -
Stage 1	-	-	-	-	945 -
Stage 2	-	-	-	-	778 -

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1631	-	-	-	662	1068
HCM Lane V/C Ratio	0.077	-	-	-	0.003	0.037
HCM Control Delay (s)	7.4	-	-	-	10.5	8.5
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0	0.1