



TECHNICAL MEMORANDUM #3B: EXISTING CONDITIONS ANALYSIS

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Project: Independence Transportation System Plan (TSP) Update

Subject: Draft Tech Memo #3B: Existing Conditions Analysis

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INTRODUCTION

This memorandum summarizes information related to existing transportation system conditions in the City of Independence for the Independence Transportation system Plan (TSP) update. This memorandum includes information on traffic counts conducted at the study intersections and the results of the intersection operations analysis, non-automobile analysis, crash analysis, access management analysis, and environmental analysis. The information provided in this memorandum addresses the requirements identified in Oregon Administrative Rule 660-012-020 (Elements of a Transportation System Plan) for providing a general assessment of existing transportation facilities and services. The information provided in this memorandum will serve as the basis for developing and evaluating transportation system alternatives and identifying improvement projects for the Independence TSP update.

TRAFFIC COUNTS

The study intersections for the Independence TSP update were determined based on direction provided by City of Independence (City) in coordination with the Oregon Department of Transportation (ODOT). There are a total of 18 study intersections located along City, County, and ODOT facilities, including two signalized intersections (9 - Monmouth Street/Gun Club Road and 10 - Monmouth Street/16th Street) and 16 unsignalized intersections. Figure 1 illustrates the location of the study intersections. Figure 2 illustrates the current lane configurations and traffic control devices at the study intersections.

Turning movement counts were conducted at the study intersections on October 15th and 16th, 2019. The counts were conducted on a typical mid-weekday when local schools were in session. Nine counts were conducted over a 16-hour period (6:00 AM. to 10:00 PM.) and nine counts were conducted over a 4-hour period (2:00 to 6:00 PM). All the counts include the total number of pedestrians, cyclists, and motor vehicles that entered the study intersections in 15-minute intervals from 2:00 to 6:00 PM and in 60-minute intervals throughout all other time periods, as applicable.

The *Analysis Methodology and Assumptions Memorandum* includes information related to the peak hour development, seasonal adjustment factors, and historical factors used to develop traffic volumes for the traffic operations analysis. Per the memorandum, a system-wide peak hour of 4:30 to 5:30 PM was selected as a basis for the analysis; seasonal adjustment factors of approximately 1.04 and 1.03 were applied to the counts to reflect the peak season, and no historical factors were applied given that the counts were conducted in 2019. The traffic volumes were also balanced as appropriate. Figure 3 summarizes the traffic volumes developed at the study intersections for the traffic operations analysis.

TRAFFIC OPERATIONS ANALYSIS

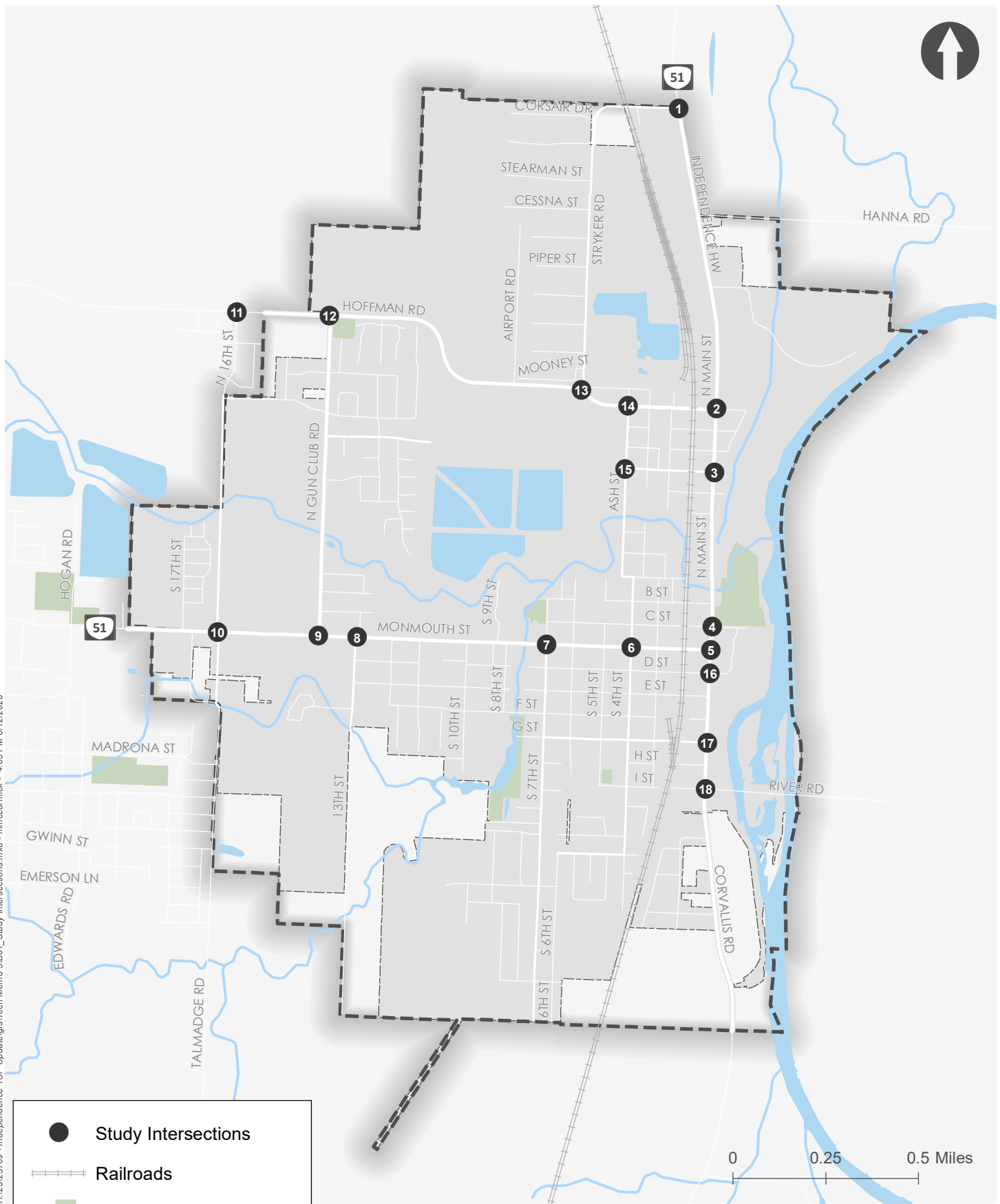
The traffic operations analysis identifies how the study intersections operate under existing traffic conditions during the weekday PM peak hour. The weekday PM peak hour was selected as a basis for the analysis given that it generally represents the most critical time period throughout the day. However, other peak hours may be more critical in some locations, such as near schools.






Intersection Operations Analysis

The intersection operations analysis was conducted using Synchro 10, which is a software tool designed to assist with operations analyses in accordance with Highway Capacity Manual (HCM) methodologies. The analysis results include level-of-service (LOS), delay (del), and volume-to-capacity (v/c) ratios at all intersections, regardless of jurisdiction. The LOS, del, and v/c ratios are reported for the overall intersection at signalized intersections and the critical movement at unsignalized intersections – the overall intersection v/c ratios were hand-calculated in accordance with the methodologies outlined in ODOT's Analysis Procedures Manual (APM).

Table 1 and Figure 3 summarize the results of the intersection operations analysis and compares the results to the applicable mobility standards and targets which were presented in the *Analysis Methodology and Assumptions Memorandum*. Attachment A contains the existing traffic conditions worksheets.

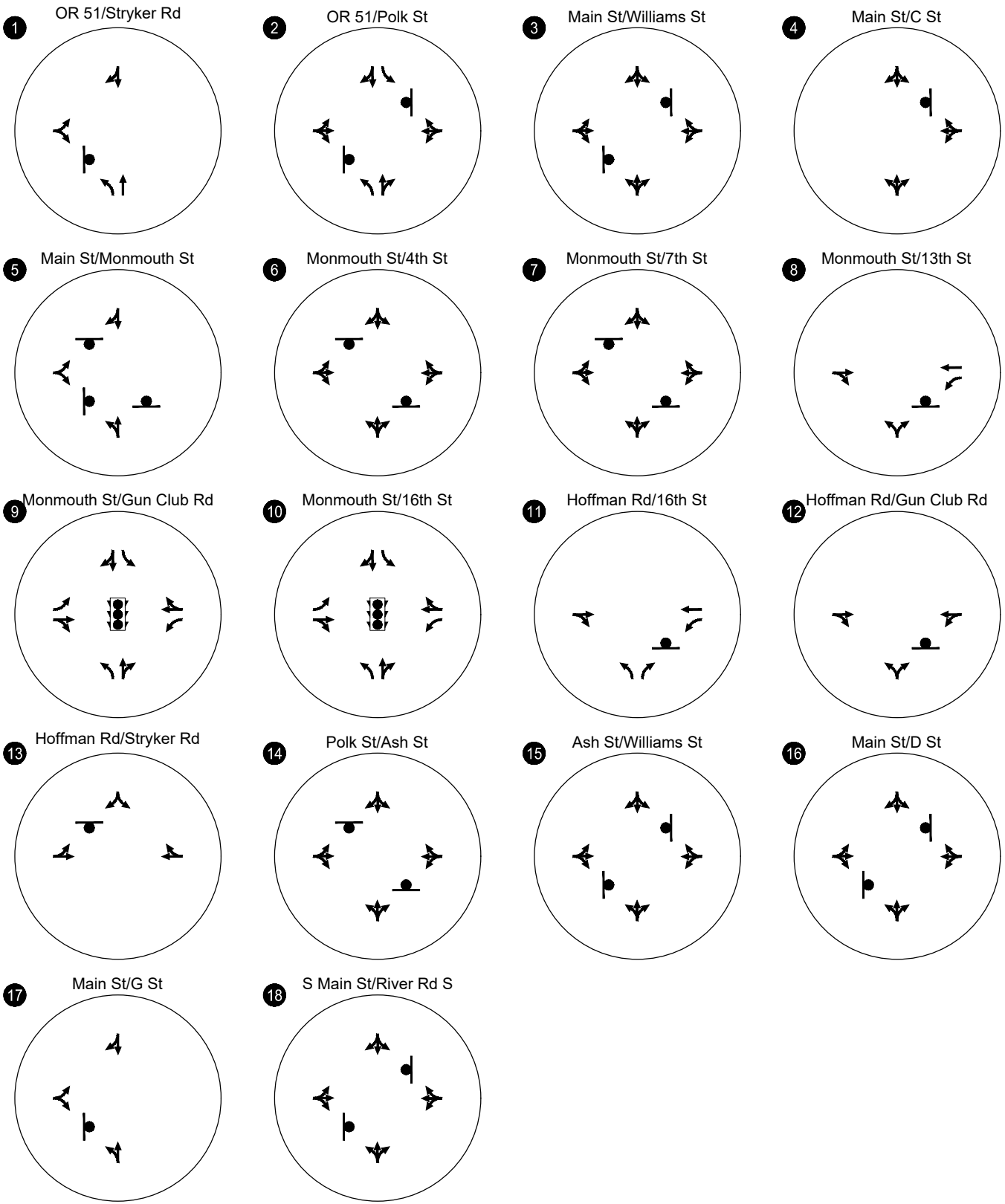
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-  Study Intersections
-  Railroads
-  Parks
-  City Boundary
-  Urban Growth Boundary

Study Intersections **Figure**
Independence, OR **1**

Data Source: Pok County Data Portal, ODOT

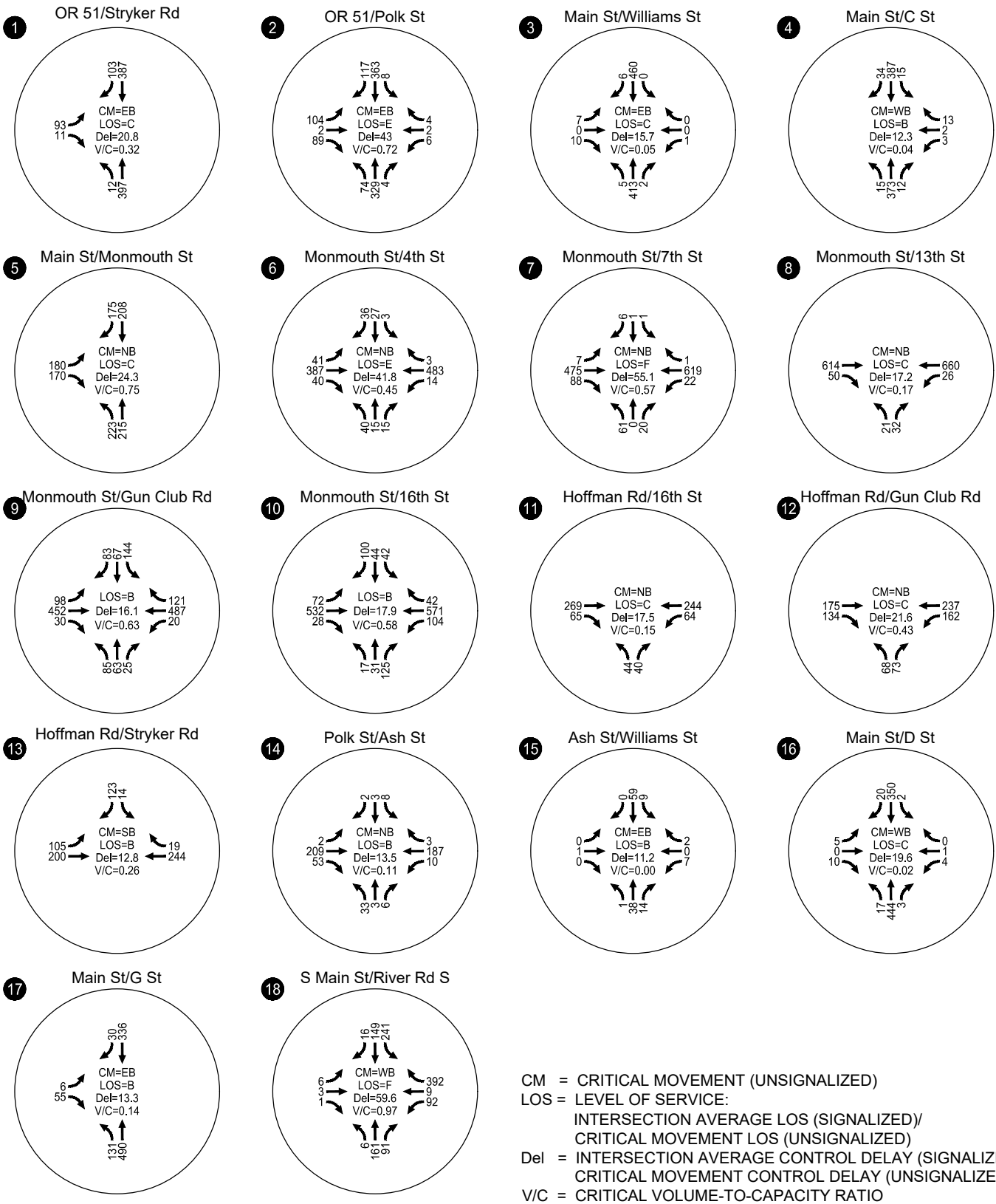


● - STOP SIGN
 ●●● - TRAFFIC SIGNAL

Existing Lane Configurations & Traffic Control Devices
 Independence, OR

Figure 2

H:\23\23769 - Independence TSP Update\analysis\Figures\23769 Ops Figures.dwg May 13, 2020 - 8:18am - mbell Layout Tab: 802_Lane Configuration



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = LEVEL OF SERVICE:
 INTERSECTION AVERAGE LOS (SIGNALIZED)/
 CRITICAL MOVEMENT LOS (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
 CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Traffic Conditions
 Weekday PM Peak Hour
 Independence, OR

Figure
 3

Table 1: Intersection Operations, Weekday PM Peak Hour

Map ID	Intersection	Control Type	Mobility Standard/Target	Intersection Operations			
				CM	LOS	Del	v/c
1	OR 51/Stryker Road	TWSC	0.90	EB	C	20.8	0.32
2	OR 51/Polk Street	TWSC	0.95	EB	E	43.0	0.72
3	Main Street/Williams Street	TWSC	0.95	EB	C	15.7	0.05
4	Main Street/C Street	TWSC	1.0	WB	B	12.3	0.04
5	Main Street/Monmouth Street	AWSC	1.0	NB	C	24.3	0.75
6	Monmouth Street/4 th Street	TWSC	1.0	NB	E	41.8	0.45
7	Monmouth Street/7 th Street	TWSC	0.95	NB	F	55.1	0.57
8	Monmouth Street/13 th Street	TWSC	0.95	NB	C	17.2	0.17
9	Monmouth Street/Gun Club Road	Signal	0.95	-	B	16.1	0.70
10	Monmouth Street/16 th Street	Signal	0.95	-	B	17.9	0.61
11	Hoffman Road/16 th Street	TWSC	LOS C	NB	C	17.5	0.15
12	Hoffman Road/Gun Club Road	TWSC	0.80	NB	C	21.6	0.43
13	Hoffman Road/Stryker Road	TWSC	0.80	SB	B	12.8	0.26
14	Polk Street/Ash Street	TWSC	0.80	NB	B	13.5	0.11
15	Ash Street/Williams Street	TWSC	0.80	EB	B	11.2	0.00
16	Main Street/D Street	TWSC	0.95	WB	C	19.6	0.02
17	Main Street/G Street	TWSC	0.80	EB	B	13.3	0.14
18	S Main Street/River Road S	TWSC	0.80	WB	F	59.6	0.97

CM = Critical movement.

LOS = Intersection Level of Service (Signal); CM Level of Service (TWSC, AWSC).

Delay = Intersection average vehicle delay (Signal); CM vehicle delay (TWSC, AWSC).

v/c = Intersection v/c (Signal); CM v/c (TWSC, AWSC).

As shown in Table 1 and Figure 3, all study intersections currently operate acceptably during the weekday PM peak hour except the S Main Street/River Road S intersection. The westbound left-turn movement operates with a v/c ratio of 0.97 under weekday PM peak hour conditions, exceeding the city's 0.80 v/c mobility target. *Attachment A includes the intersection operations analysis worksheets.*

Queueing Analysis

A queuing analysis was conducted at the signalized study intersections using Synchro 10. Table 2 summarizes the 95th percentile queues during the weekday PM peak hour and indicates if existing storage can accommodate the queues. The vehicle queue and storage lengths were rounded up to the nearest 25-feet. The storage lengths reflect the striped storage for each movement at the intersections. *Attachment A contains the queuing analysis worksheets.*

As shown in Table 2, the striped storage lengths at the signalized study intersections are currently adequate for the 95th percentile queues except for the southbound left-turn queue at the Monmouth Street/Gun Club Road intersection. The southbound left-turn lane length on Gun Club Road is restricted by the pavement width between Monmouth Street and C Street. The left turn lane is provided along the segment of Gun Club Road where the southbound bike lane ends north of Monmouth Street.

Table 2: Queuing Summary, Weekday PM Peak Hour

Map ID	Intersection	Movement	Storage Length (feet)	95 th Percentile Queue (feet)	Adequate?
9	Monmouth Street/Gun Club Road	EBL	150	50	Yes
		WBL	150	<25	Yes
		NBL	100	100	Yes
		SBL	50	150	No
10	Monmouth Street/16 th Street	EBL	250	50	Yes
		WBL	225	50	Yes
		NBL	100	50	Yes
		SBL	225	75	Yes

EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, L = Left

NON-AUTOMOBILE TRANSPORTATION ANALYSIS

The non-automobile transportation analysis was conducted in accordance with the methodologies identified in Chapter 14 of ODOT's APM. Per the APM, Bicycle Level of Traffic Street, Pedestrian Level of Traffic Stress, and Transit Qualitative Multimodal Assessment are appropriate analysis methodologies for TSP updates.

Transit Qualitative Multimodal Assessment

A transit qualitative multimodal assessment was conducted in accordance with the methodology described in ODOT's APM. Transit factors that should be considered are frequency and on-time reliability, schedule speed/travel times, transit stop amenities, and connecting pedestrian/bicycle network. This methodology applies a rating system similar to that used for pavement conditions; excellent, good, fair, and poor. Table 3 outlines the methodology used for conducting a transit qualitative multimodal assessment within Independence.

Table 3: Transit Qualitative Multimodal Assessment Methodology – For Rural Express Service

Category	Excellent	Good	Fair	Poor
Frequency	12 daily round trips	8-10 daily round trips	5-7 daily round trips	4 or fewer daily round trips
Schedule Speed/Travel Times	<20% slower than driving	20% to 40% slower than driving	40% to 60% slower than driving	>60% slower than driving
Transit Stop Amenities	Shelter with bench and sign	Bench with sign	Sign with waiting area	No sign and/or no waiting area
Connecting Pedestrian/Bicycle Network	Wide shoulders or bike lanes and sidewalks with frequent crossing	Standard shoulders or bike lanes and sidewalks with crossings	Substandard shoulders or bike lanes and sidewalks with no crossing	No shoulders, bike lanes, or sidewalks and no crossings
ADA Accessibility	All stops are ADA-compliant and have adjacent parking prohibited	85-99% of stops are ADA-compliant and have adjacent parking prohibited	70-84% of stops are ADA-compliant and have adjacent parking prohibited	Less the 70% of stops are ADA-compliant and have adjacent parking prohibited

Frequency

From the user's perspective, *frequency* determines how many times an hour a user has access to transit service, assuming that service is provided within acceptable walking distance and at the times the user wishes to travel. Frequency also helps determine the convenience of transit service to riders and is one component of overall transit trip time (helping to determine the wait time at a stop).

The only fixed route service provided in Independence is the Cherriots Route 40X: Polk County/Salem Express. On weekdays, the service operates eight daily trips with frequencies is between 60 and 180 minutes. On Saturdays, the service operates four daily trips with frequencies between 135 and 370 minutes. The frequency rating for Route 40X is good.

Per the APM, on-time reliability is typically evaluated along with frequency. Per information provided by Cherriots, the on-time reliability of Route 40X is 89 percent in Fiscal Year 2019, which is higher than the Cherriots Regional average of 85 percent.

Schedule Speed/Travel Times

Schedule speed and travel time refer to the time it takes to complete a transit route in full and the length of time between stops. Cherriots operates as a hub and spoke system, with Downtown Salem as the main hub of service. Route 40X: Polk County/Salem Express connects Salem to Dallas via Independence and Monmouth. On one full roundtrip, the bus makes six stops in Independence (two served by the same transit stop on 13th Street) and 18 stops total in 120 minutes. The same route driven in a single-occupancy vehicle is approximately 90 minutes roundtrip. The schedule speed/travel speed rating for Route 40X is good.

Transit Stop Amenities

Amenities at transit stops, such as bus benches and bus shelters, enhance a transit route and make it more user-friendly. Steps that can make this mode as comfortable and accommodating as possible may help encourage ridership. For Route 40X, Cherriots provides five transit stops in Independence. All transit stops have a sign and pole designating the stop. In addition to signage, the three transit stops provided for service to Salem include shelters, trash receptacles, and posted schedules. The transit stop amenities rating for Route 40X is good.

Connecting Pedestrian/Bicycle Network

Pedestrian facilities are provided adjacent to all bus stops in Independence. In addition, marked crosswalks are provided within a city block of all bus stops. Designated bicycle facilities are not provided adjacent to bus stops in Independence, although stops on Monmouth Street in the downtown area and on 13th Street are supported by low-speed roadways where mixed traffic may support cyclists. Filling gaps in the existing bicycle network would help create more of a multimodal system to support transit within Independence as well. The connecting pedestrian/bicycle network rating for Route 40X is good.

ADA Accessibility

Based on ODOT's TransGIS inventory, all pedestrian ramps adjacent to bus stops within the city are rated as poor or missing. In addition, parking is allowed adjacent to three of the five bus stops serving Independence. Adjacent parking can block buses from reaching the curb space, impacting the ability of passengers to board and alight from the vehicle. The ADA accessibility rating for Route 40X is poor.

Pedestrian Level of Traffic Stress

Pedestrian level of traffic stress (PLTS) is a perception-based analysis methodology that is used to evaluate the adequacy of streets to accommodate pedestrians in urban and rural environments. As applied by ODOT, this methodology classifies four levels of traffic stress that a pedestrian can experience on the street, ranging from PLTS 1 (little traffic stress) to PLTS 4 (high traffic stress). A street or street segment that is rated PLTS 1 generally has low traffic volumes and travel speeds and has a sidewalk that is separated from vehicle traffic. These segments are generally suitable for all pedestrians, including children. A street or street segment that is rated PLTS 4 generally has high traffic volumes and travel speeds and is perceived as unsafe by most adults. Segments rated PLTS 4 also include those with no sidewalks or other pedestrian facilities. Per the APM, PLTS 2 is considered a reasonable target for streets due to its acceptability with most pedestrians.

The PLTS score is determined based on four criteria, including sidewalk condition, physical buffer type, total buffering width, and general land use. All four criteria are scored from 1 to 4 and the highest score determines the overall score for the road segment. Table 4 summarizes the results of the PLTS analysis. Figure 4 illustrates the results of the PLTS analysis for the arterial and collector streets in Independence. It is important to note that while some segments are shown as PLTS 3 or 4, they may have shorter segments with lower PLTS scores.

As shown in Figure 4, several arterial and collector streets in Independence have segments that are rated PLTS 3 and PLTS 4. The segments rated PLTS 3 may have curb-tight sidewalks on roadways with speeds of 30 mph or higher. In order for these segments to be rated PLTS 2, the speeds would need to be reduced to 25 mph or a buffer would need to be installed between the sidewalk and vehicle travel lane. Other segments rated PLTS 3 may have narrow sidewalks. In order for these segments to be rated PLTS 2, the sidewalks would need to be widened to at least five feet wide. Other segments may be located adjacent to industrial land uses, such as those in northern Independence. Per the APM, these segments are automatically rated PLTS 3 or 4 given the auto-oriented nature of these land uses. For these segments, the priority is filling gaps instead of reaching PLTS 2.

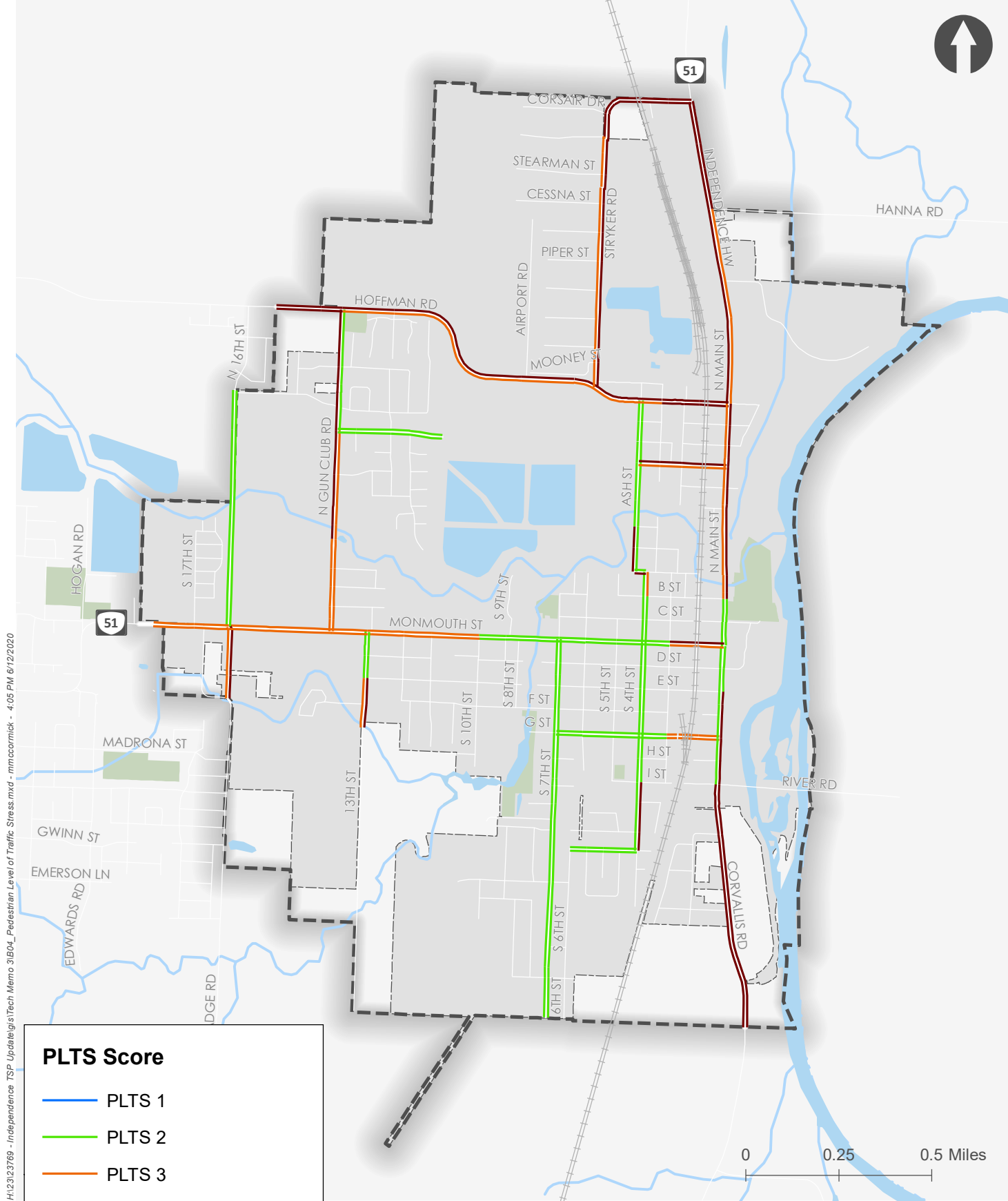
The majority of segments rated PLTS 4 have no sidewalks or other pedestrian facilities. In order for these segments to be rated PLTS 2, sidewalks with appropriate sidewalk and buffer widths would need to be installed along the full length of the roadway. *Attachment B* contains detailed information on the PLTS analysis results.

Table 4: Pedestrian Level of Traffic Stress (PLTS) Analysis Results

Street	From	To	Side	PLTS Criteria				PLTS
				Sidewalk Condition	Physical Buffer Width	Total Buffer Width	General Land Use	
OR 51	Stryker Road	Hanna Road	East	4	4	2	2	4
	Stryker Road	Hanna Road	West	2	4	2	3	4
	Hanna Road	Polk Street	East	2	3	2	3	3
	Hanna Road	Polk Street	West	2	3	2	4	4
	Polk Street	B Street	East	4	3	3	1	4
	Polk Street	B Street	West	3	3	2	1	3
OR 51-Main Street	B Street	Monmouth Street	East	2	2	2	1	2
	B Street	Monmouth Street	West	2	2	2	1	2
Main Street	Monmouth Street	E Street	East	2	2	2	1	2
	Monmouth Street	E Street	West	2	2	2	1	2
	E Street	River Road	East	4	3	1	1	4
	E Street	River Road	West	2	2	1	1	2
Corvallis Road	River Road	Southern UGB	East	4	N/A	N/A	N/A	4
	River Road	Southern UGB	West	4	3	2	1	4
OR 51-Monmouth Street	Western UGB	10 th Street	North	2	3	2	2	3
	Western UGB	10 th Street	South	2	3	2	2	3
	10 th Street	3 rd Street	North	2	2	2	2	2
	10 th Street	3 rd Street	South	2	2	2	2	2
	3 rd Street	Main Street	North	4	2	2	1	4
	3 rd Street	Main Street	South	3	2	2	1	3
Gun Club Road	Hoffman Road	Picture Street	East	2	2	2	1	2
	Hoffman Road	Picture Street	West	4	2	1	1	4
	Picture Street	South of Ash Creek	East	2	3	2	1	3
	Picture Street	South of Ash Creek	West	4	N/A	N/A	N/A	4
	South of Ash Creek	Monmouth Street	East	2	3	2	1	3

Street	From	To	Side	PLTS Criteria				PLTS
				Sidewalk Condition	Physical Buffer Width	Total Buffer Width	General Land Use	
	South of Ash Creek	Monmouth Street	West	2	3	2	1	3
Hoffman Road	Western UGB	Gun Club Road	North	4	N/A	N/A	N/A	4
	Western UGB	Gun Club Road	South	4	N/A	N/A	N/A	4
	Gun Club Road	West of Stryker Road	North	4	1	1	1	4
	Gun Club Road	West of Stryker Road	South	2	1	2	3	3
Polk Street	West of Stryker Road	Walnut Street	North	2	1	1	4	4
	West of Stryker Road	Walnut Street	South	2	1	1	3	3
	Walnut Street	OR 51-Main Street	North	4	2	2	4	4
	Walnut Street	OR 51-Main Street	South	4	2	2	4	4
Stryker Street	OR 51	Skyraider Drive	East	4	3	1	1	4
	OR 51	Skyraider Drive	West	4	2	2	4	4
	Skyraider Drive	Polk Street	East	4	3	1	4	4
	Skyraider Drive	Polk Street	West	2	3	2	1	3
Williams Street	Ash Street	OR 51-Main Street	North	4	2	2	1	4
	Ash Street	OR 51-Main Street	South	3	2	2	1	3
Picture Street	Gun Club Road	End of road	North	2	2	2	1	2
	Gun Club Road	End of road	South	2	2	2	1	2
Ash Street	Polk Street	Albert Street	East	2	2	2	1	2
	Polk Street	Albert Street	West	2	2	2	1	2
	Albert Street	4 th Street	East	2	2	2	1	2
	Albert Street	4 th Street	West	4	2	2	1	4
4 th Street	Ash Street	B Street	East	3	1	1	1	3
	Ash Street	B Street	West	2	1	1	1	2

Street	From	To	Side	PLTS Criteria				PLTS
				Sidewalk Condition	Physical Buffer Width	Total Buffer Width	General Land Use	
	B Street	I Street	East	2	1	1	1	2
	B Street	I Street	West	2	2	2	1	2
	I Street	Spruce Avenue	East	4	N/A	N/A	N/A	4
	I Street	Spruce Avenue	West	2	2	2	1	2
7 th Street	Monmouth Street	Southern UGB	East	2	2	2	1	2
	Monmouth Street	Southern UGB	West	2	1	2	1	2
13 th Street	Monmouth Street	E Street	East	2	2	2	1	2
	Monmouth Street	E Street	West	2	2	2	2	2
	E Street	Southern City Limits	East	4	N/A	N/A	N/A	4
	E Street	Southern City Limits	West	3	2	2	1	3
	Southern City Limits	Southern UGB	East	4	N/A	N/A	N/A	4
	Southern City Limits	Southern UGB	West	4	N/A	N/A	N/A	4
16 th Street	Northern UGB	Monmouth Street	East	2	2	2	1	2
	Northern UGB	Monmouth Street	West	2	2	2	1	2
	Monmouth Street	Southern UGB	East	4	2	3	2	4
	Monmouth Street	Southern UGB	West	3	2	1	1	3
G Street	7 th Street	3 rd Street	North	2	1	2	1	2
	7 th Street	3 rd Street	South	2	2	2	1	2
	3 rd Street	Main Street	North	2	2	2	3	3
	3 rd Street	Main Street	South	2	2	2	3	3
Spruce Avenue	6 th Street	4 th Street	North	2	2	2	1	2
	6 th Street	4 th Street	South	2	2	2	1	2



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**Pedestrian Level of Traffic Stress
Independence, OR**

**Figure
4**

Data Source: Pok County Data Portal, ODOT

Bicycle Level of Traffic Stress

Similar to PLTS, Bicycle level of traffic stress (BLTS) is a perception-based analysis methodology that is used to evaluate the adequacy of streets to accommodate cyclists in urban and rural environments. As applied by ODOT, this methodology classifies four levels of traffic stress that a cyclist can experience on the street, ranging from BLTS 1 (little traffic stress) to BLTS 4 (high traffic stress). A street or street segment that is rated BLTS 1 generally has low traffic volumes and travel speeds and is suitable for all cyclists, including children. A street or street segment that is rated BLTS 4 generally has high traffic volumes and travel speeds and is perceived as unsafe by most adults. Per the APM, BLTS 2 is considered a reasonable target for streets due to its acceptability with most cyclists.

The BLTS score is determined based on the speed of the street, the number of travel lanes per direction, the presence and width of an on-street bike lane and/or adjacent parking lane, and several other factors. Table 5 summarizes the results of the BLTS analysis. Figure 5 illustrates the results of the BLTS analysis for the arterial and collector streets in Independence. It is important to note that while some segments are shown as BLTS 3 or 4, they may have shorter segments with lower BLTS scores.

As shown in Figure 5, several arterial and collector streets in Independence have segments that are rated BLTS 3 and BLTS 4. The segments rated BLTS 3 or BLTS 4 may have bike lanes that are too narrow for roadway conditions (i.e. posted speed). In order for these segments to be rated BLTS 2, the bike lanes would need to be widened to seven feet and/or the posted speed would need to be 30 mph. For example, the segment of OR 51-Monmouth Street between Hanna Road and Polk Street has striped bike lanes that are approximately six feet wide and posted speeds of 35 and 45 mph. For this segment to be rated BLTS 2, the posted speed would need to be 30 mph or the bike lane would need to be widened to seven feet and the posted speed would need to be 35 mph. Other segments rated BLTS 3 may not have bike lanes and may be considered mixed traffic (shoulder bikeways or no bicycle facilities present). In order for these segments to be rated BLTS 2, the shoulder would need to be restriped as a bike lane with appropriate width or traffic volumes would need to be below 2,500 ADT and the posted speed would need to be 25 mph. It should also be noted that a majority of the segments evaluated as mixed traffic that were rated BLTS 2 could include signage and/or striping to remind motorists to share the road. The signing and striping can also provide important wayfinding for cyclists to inform them of the preferred bicycle routes.

Table 5: Bicycle Level of Traffic Stress (BLTS) Analysis Results

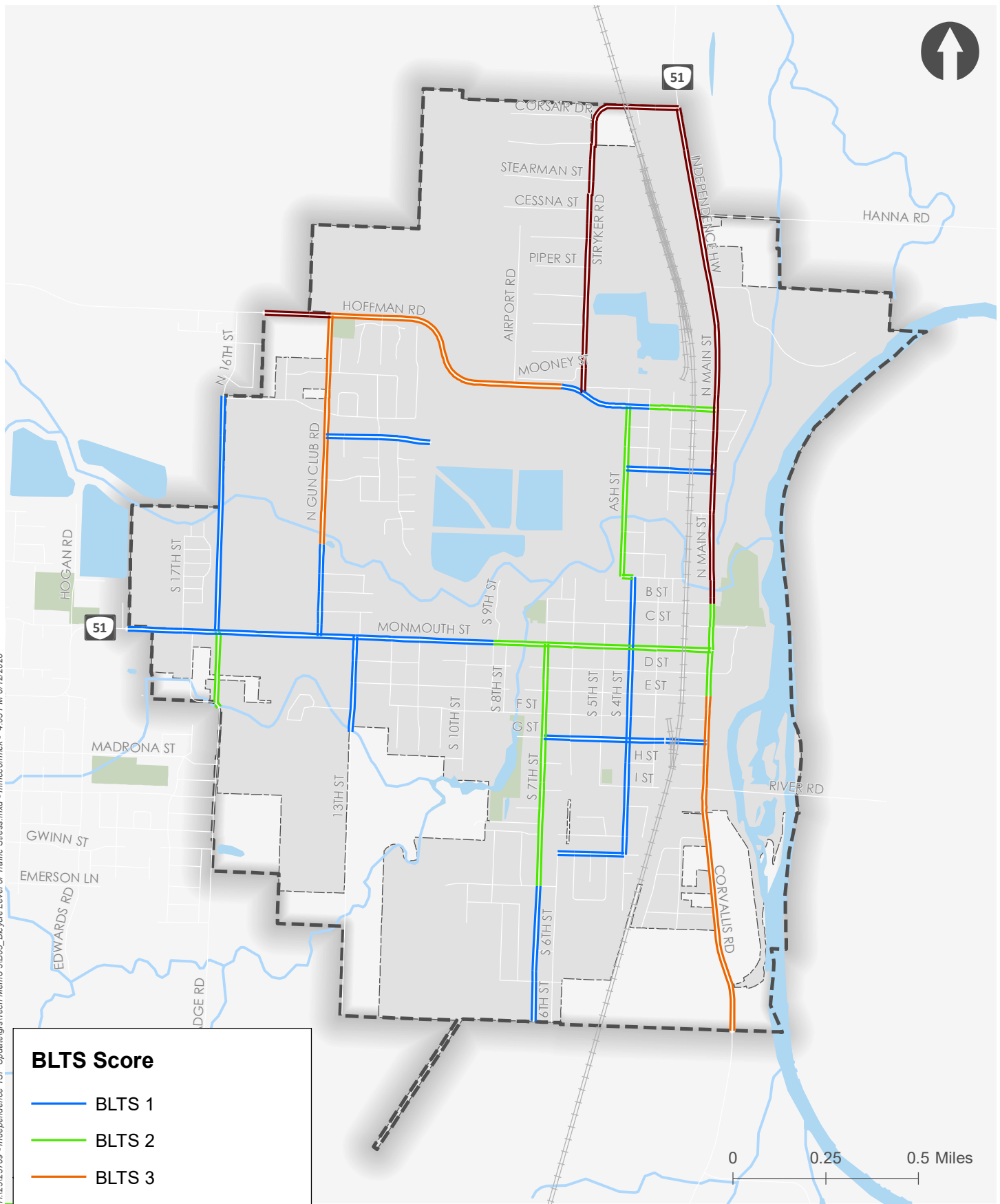
Street	From	To	Side	Facility Type	BLTS Criteria					BLTS
					Speed (mph)	Lanes per Direction	Bicycle Facility Width (feet)	Parking	Frequent Blockage	
OR 51	Stryker Road	Hanna Road	East	None/Bike Lane	45	1	None/7	None	No	4
	Stryker Road	Hanna Road	West	Bike Lane	45	1	6	None	No	4
	Hanna Road	Polk Street	East	Bike Lane	35 - 45	1	5.5 - 6	None	No	4
	Hanna Road	Polk Street	West	Bike Lane	35 - 45	1	5.5 - 6	None	No	4
	Polk Street	B Street	East	None/ Shoulder Bikeway	35	1	None/9 - 11	None/ Permitted	No	4
	Polk Street	B Street	West	None/ Shoulder Bikeway	35	1	None/4 - 11	None/ Permitted	No	4
OR 51-Main Street	B Street	Monmouth Street	East	None	20	1	None	Yes	No	2
	B Street	Monmouth Street	West	None	20	1	None	Yes	No	2
Main Street	Monmouth Street	E Street	East	None	20	1	None	Yes	No	2
	Monmouth Street	E Street	West	None	20	1	None	Yes	No	2
	E Street	River Road	East	None/ Shoulder Bikeway	20 - 30	1	None/6	None/Marked	No	3
	E Street	River Road	West	None/ Shoulder Bikeway	20 - 30	1	None/6	None/Marked	No	3
Corvallis Road	River Road	Southern UGB	East	None	30	1	None	None	No	3
	River Road	Southern UGB	West	None	30	1	None	None/Marked	No	3
	Western UGB	9 th Street	North	Bike Lane	25 - 30	1	5	None	No	1

Street	From	To	Side	Facility Type	BLTS Criteria					BLTS
					Speed (mph)	Lanes per Direction	Bicycle Facility Width (feet)	Parking	Frequent Blockage	
OR 51- Monmouth Street	Western UGB	9 th Street	South	Bike Lane	25 – 30	1	5	None	No	1
	9 th Street	Main Street	North	None/Bike Lane	20 – 25	1	None/5	None/Permitted/Marked	No	2
	9 th Street	Main Street	South	None/Bike Lane	20 – 25	1	None/5	None/Permitted/Marked	No	2
Gun Club Road	Hoffman Road	Picture Street	East	None/Bike Lane/ Shoulder Bikeway	30	1	None/4 - 6	None	No	3
	Hoffman Road	Picture Street	West	None/Bike Lane	30	1	None/6 - 8	None	No	3
	Picture Street	South of Ash Creek	East	None/Bike Lane	30	1	None/6 - 8	None	No	3
	Picture Street	South of Ash Creek	West	None	30	1	None	None	No	3
	South of Ash Creek	Monmouth Street	East	Bike Lane	30	1	6	None	No	1
	South of Ash Creek	Monmouth Street	West	Bike Lane	30	1	6	None	No	1
Hoffman Road	Western UGB	Gun Club Road	North	None	35 - 40	1	None	None	No	4
	Western UGB	Gun Club Road	South	None	35 - 40	1	None	None	No	4
	Gun Club Road	West of Stryker Road	North	Bike Lane	35	1	4	None	No	3
	Gun Club Road	West of Stryker Road	South	Bike Lane	35	1	4	None	No	3
Polk Street	West of Stryker Road	Walnut Street	North	Bike Lane	25	1	4	None	No	1

Street	From	To	Side	Facility Type	BLTS Criteria					BLTS
					Speed (mph)	Lanes per Direction	Bicycle Facility Width (feet)	Parking	Frequent Blockage	
Stryker Road	West of Stryker Road	Walnut Street	South	Bike Lane	25	1	4	None	No	1
	Walnut Street	OR 51-Main Street	North	None/Bike Lane	25	1	None/4 - 6	No	No	2
	Walnut Street	OR 51-Main Street	South	None	25	1	None	None	No	2
Stryker Road	OR 51	Polk Street	East	None/ Shoulder Bikeway	35	1	None/5	None	No	4
	OR 51	Polk Street	West	None/ Shoulder Bikeway	35	1	None/5	None	No	4
Williams Street	Ash Street	OR 51-Main Street	North	None	25	1	None	Permitted	No	1
	Ash Street	OR 51-Main Street	South	None	25	1	None	Permitted	No	1
Picture Street	Gun Club Road	End of road	North	None	25	1	None	Permitted	No	1
	Gun Club Road	End of road	South	None	25	1	None	Permitted	No	1
Ash Street	Polk Street	4 th Street	East	None	25	1	None	Permitted	No	2
	Polk Street	4 th Street	West	None	25	1	None	Permitted	No	2
4 th Street	Ash Street	Spruce Avenue	East	None	25	1	None	None/Permitted/Marked	No	1
	Ash Street	Spruce Avenue	West	None	25	1	None	None/ Permitted	No	1
7 th Street	Monmouth Street	Chestnut Street	East	None	25	1	None	None	No	2
	Monmouth Street	Chestnut Street	West	None	25	1	None	Permitted	No	2

Street	From	To	Side	Facility Type	BLTS Criteria					BLTS
					Speed (mph)	Lanes per Direction	Bicycle Facility Width (feet)	Parking	Frequent Blockage	
Chestnut Street	Chestnut Street	Southern UGB	East	None	25	1	None	None	No	1
	Chestnut Street	Southern UGB	West	None	25	1	None	Permitted	No	1
13 th Street	Monmouth Street	Southern UGB	East	None	25	1	None	None	No	1
	Monmouth Street	Southern UGB	West	None	25	1	None	None/ Permitted	No	1
16 th Street	Northern UGB	Monmouth Street	East	Bike Lane	25	1	5	None	No	1
	Northern UGB	Monmouth Street	West	Bike Lane	25	1	5	None	No	1
	Monmouth Street	Southern UGB	East	None/ Shoulder Bikeway	25	1	None/4 - 11	None	No	2
	Monmouth Street	Southern UGB	West	Shoulder Bikeway	25	1	5	None	No	2
G Street	7 th Street	Main Street	North	None	25	1	None	None/ Permitted	No	1
	7 th Street	Main Street	South	None	25	1	None	None/ Permitted	No	1
Spruce Avenue	6 th Street	4 th Street	North	None	25	1	None	Permitted	No	1
	6 th Street	4 th Street	South	None	25	1	None	Permitted	No	1

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**Bicycle Level of Traffic Stress
Independence, OR**

**Figure
5**

Data Source: Pok County Data Portal, ODOT

CRASH ANALYSIS

Crash records were obtained from ODOT for the five-year period from January 1, 2013 through December 31, 2017 for the overall study area. Figure 6 illustrates the location, severity, and type of crashes that occurred within the study area over the five-year period. Based on the data, a total of 269 crashes occurred in Independence, of which one resulted in a fatality, 144 resulted in injuries, and 124 resulted in property-damage-only. The following summarizes the results of the intersection and segment crash analysis based on the five years of crash data.

Intersection Crash Analysis

The intersection crash analysis includes an evaluation of intersection crash rates, critical crash rates, and excess proportion of specific crash types. The intersection crash analysis identifies the study intersections where existing safety issues may exist – based on the data, 61 of the 269 reported crashes occurred at the study intersections. Table 6 summarizes the collision type and crash severity for all reported crashes at the study intersections.

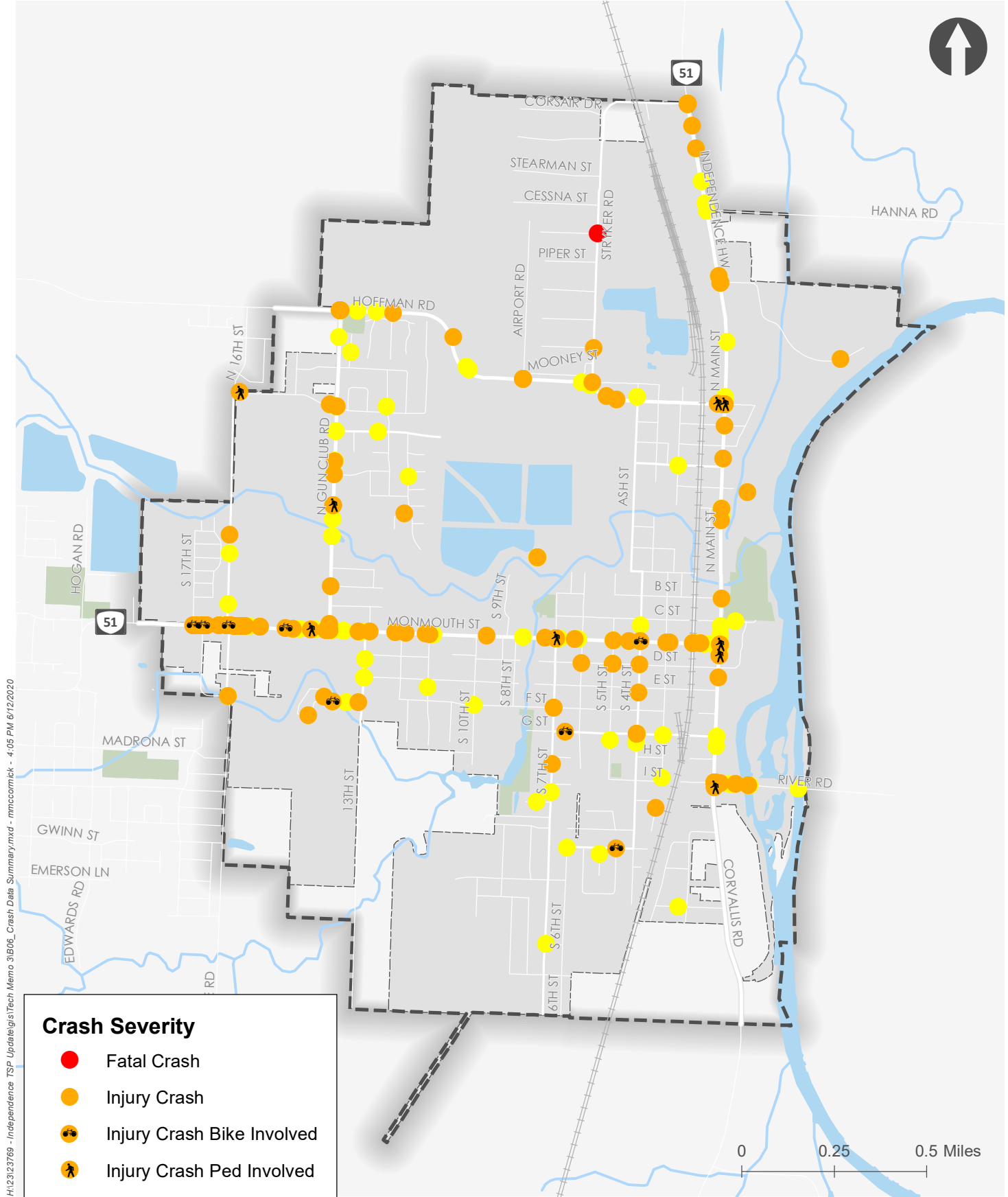
Table 6: Intersection Crash History (January 1, 2013 through December 31, 2017)

Map ID	Intersection	Collision Type					Crash Severity			Total
		Angle	Turn	Rear-End	Ped/Bike	Other	Fatal	Injury	PDO	
1	OR 51/Stryker Road		4					3	1	4
2	OR 51/Polk Street	2	3		1	1		4	3	7
3	Main Street/Williams Street									0
4	Main Street/C Street									0
5	Main Street/Monmouth Street			1	1	2		2	2	4
6	Monmouth Street/4 th Street	2						2		2
7	Monmouth Street/7 th Street	1	1	2		1		5		5
8	Monmouth Street/13 th Street			1				1		1
9	Monmouth Street/Gun Club Road	2	8	3				8	5	13
10	Monmouth Street/16 th Street		2						2	2
11	Hoffman Road/16 th Street	2	3	3	1			6	3	9
12	Hoffman Road/Gun Club Road		2	2				3	1	4
13	Hoffman Road/Stryker Road		1	1	1			1	2	3
14	Polk Street/Ash Street									0
15	Ash Street/Williams Street									0
16	Main Street/D Street									0
17	Main Street/G Street									0
18	S Main Street/River Road S	1	1	4		1		4	3	7

Fatal: Includes fatal and incapacitating injuries

Injury: Includes non-incapacitating injuries and possible injuries/complaint of pain

PDO: Property Damage Only:



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**Reported Crashes from 2013 to 2017
Independence, OR**

**Figure
6**

Data Source: Pok County Data Portal, ODOT

Intersection Crash Rates

Intersection crash rates were developed for the study intersections based on the total number of crashes reported at the intersections over the five-year period and the total entering volume, or million entering vehicles (MEV). Intersection crash rates were compared to 90th percentile crash rates developed by ODOT and documented in Table 4-1 of the ODOT APM. Table 7 summarizes the total number of crashes reported at the study intersections over the five-year period, the intersection crash rates, and the corresponding 90th percentile crash rates as identified in the APM.

Table 7: Intersection Crash Rates vs. ODOT 90th Percentile Rates

Map ID	Intersection	Total Crashes	Intersection Crash Rate	90 th Percentile Rate	Exceed 90 th Percentile Rate?
1	OR 51/Stryker Road	4	0.22	0.29	No
2	OR 51/Polk Street	7	0.35	0.41	No
3	Main Street/Williams Street	0	0.00	0.41	No
4	Main Street/C Street	0	0.00	0.41	No
5	Main Street/Monmouth Street	4	0.19	0.29	No
6	Monmouth Street/4 th Street	2	0.10	0.41	No
7	Monmouth Street/7 th Street	5	0.21	0.41	No
8	Monmouth Street/13 th Street	1	0.04	0.41	No
9	Monmouth Street/Gun Club Road	13	0.43	0.51	No
10	Monmouth Street/16 th Street	2	0.06	0.86	No
11	Hoffman Road/16 th Street	9	0.68	0.29	Yes
12	Hoffman Road/Gun Club Road	4	0.26	0.29	No
13	Hoffman Road/Stryker Road	3	0.26	0.29	No
14	Polk Street/Ash Street	0	0.00	0.41	No
15	Ash Street/Williams Street	0	0.00	0.29	No
16	Main Street/D Street	0	0.00	0.41	No
17	Main Street/G Street	0	0.00	0.29	No
18	S Main Street/River Road S	7	0.33	0.41	No

As shown in Table 7, the Hoffman Road/16th Street intersection currently exceeds the corresponding 90th percentile crash rate. *Attachment C contains the intersection crash rate analysis worksheet.*

Critical Crash Rates

Critical crash rates were developed for the study intersections with sufficient reference populations based on the total number of crashes reported at the intersections over the five-year period, intersection type, and the total entering volume or average annual daily traffic (AADT). This method is only applicable where at least 5-10 intersections are available with similar characteristics (i.e. traffic control and legs/approaches). Otherwise, the critical crash rate defaults to the 90th percentile crash rates outlined in Table 8. Critical crash rates were calculated for the study intersections using ODOT's Critical Crash Rate Calculator tool. Table 8 summarizes the total number of crashes reported at the study intersections over the five-year period, the intersection crash rates, and the corresponding critical crash rates.

Table 8: Intersection Crash Rates vs. Critical Crash Rates

Map ID	Intersection	Total Crashes	Intersection Crash Rate	Critical Crash Rate	Exceed Critical Crash Rate?
1	OR 51/Stryker Road	4	0.22	0.45	No
2	OR 51/Polk Street	7	0.35	0.29	Yes
3	Main Street/Williams Street	0	0.00	0.31	No
4	Main Street/C Street	0	0.00	0.31	No
5	Main Street/Monmouth Street	4	0.19	0.43	No
6	Monmouth Street/4 th Street	2	0.10	0.29	No
7	Monmouth Street/7 th Street	5	0.21	0.27	No
8	Monmouth Street/13 th Street	1	0.04	0.27	No
9	Monmouth Street/Gun Club Road	13	0.43	N/A	N/A
10	Monmouth Street/16 th Street	2	0.06	N/A	N/A
11	Hoffman Road/16 th Street	9	0.68	0.49	Yes
12	Hoffman Road/Gun Club Road	4	0.26	0.47	No
13	Hoffman Road/Stryker Road	3	0.26	0.49	No
14	Polk Street/Ash Street	0	0.00	0.38	No
15	Ash Street/Williams Street	0	0.00	0.96	No
16	Main Street/D Street	0	0.00	0.31	No
17	Main Street/G Street	0	0.00	0.44	No
18	S Main Street/River Road S	7	0.33	0.28	Yes

As shown in Table 8, the OR 51/Polk Road, Hoffman Road/16th Street, and Main Street/River Road intersections currently exceed their corresponding critical crash rates. Attachment C contains the critical crash rate analysis worksheet.

Excess Proportion of Specific Crash Types

The Excess Proportion of Specific Crash Types analysis method quantifies the extent to which a specific crash type is overrepresented at an intersection when compared to the average representation within a reference population (five or more intersections with the same configuration). The analysis method does not consider the overall frequency or rate of crashes, instead it considers only the types of crashes observed. It is useful for identifying locations that may benefit from targeted countermeasures. This method is best used in conjunction with the Critical Crash Rate analysis described above, as the two methods have complementary strengths and weaknesses.

Table 9 summarizes the intersections with a high probability (over 90 percent) that the long-term expected proportion of specific crash types will be greater than the long-term expected proportion of the specific crash types when compared to other intersections in the reference population. The table shows the study intersection, intersection type/reference population, the collision type in excess, the probability of future occurrences, and the proportion of benefit or the likelihood that the intersection will benefit from a countermeasure targeted at the specific crash type. Attachment C contains the excess proportion of specific crash types analysis worksheet.

Table 9: Excess Proportions of Specific Crash Types

Map ID	Intersection	Intersection Type/Reference Population	Collision Type in Excess	Probability of Future Occurrence	Proportion of Benefit
1	OR 51/Stryker Road	3ST	Turn	100%	0.58
6	Monmouth Street/4 th Street	4ST	Angle	99%	0.73
7	Monmouth Street/7 th Street	4ST	Rear-end	92%	0.08*
12	Hoffman Road/Gun Club Road	3ST	Rear-end	93%	0.21
18	S Main Street/River Road S	4ST	Rear-end	97%	0.25

*A proportion of benefit below 0.10 indicates that a countermeasure will have limited impact on proportion of crash type.

Segment Crash Analysis

This section evaluates crashes along study area roadways, excluding crashes at study intersections, by comparing their overall crash rates in Table II of the 2017 statewide Crash Rate Book. Table II lists crash rates for mainline State highways for the past five years, by federally defined urban and rural areas and functional classification.

Segment crash rates were developed for study area roadways and roadway segments based on the total number of crashes reported along the segments over the five-year period along with the segments lengths, and traffic volumes. The total number of crashes along the segments and the segment lengths were obtained from GIS data. Traffic volume data were estimated for the segments based on the traffic counts collected at the study intersections. Table 10 summarizes the segment crash rates for each study segment and compares them to ODOT's state highway system crash rates.

Table 10: Segment Crash Rates vs. ODOT State Highway System Crash Rates

Map ID	Street (from/To)	Segment Length (mile)	Segment Crash Rate	State Highway Crash Rate	Exceed State Highway Rate?
1	OR 51-Main Street from Stryker Road to Polk Street	0.82	1.07	2.39	No
2	OR 51-Main Street from Polk Street to Monmouth Street	0.62	1.14	2.39	No
3	Main Street from OR 51-Monmouth Street to south city limits	0.44	0.76	2.39	No
4	OR 51-Monmouth St from west city limits to Gun Club Road	0.39	4.06	2.39	Yes
5	OR 51-Monmouth Street from Gun Club Road to 7 th Street	0.61	1.55	2.39	No
6	OR 51-Monmouth Street from 7 th Street to OR 51-Main Street	0.44	2.72	2.39	No
7	16 th Street from OR 51-Monmouth Street to north city limits	0.34	1.48	1.70	No
8	16 th Street from OR 51-Monmouth Street to south city limits	0.20	1.60	1.70	No
9	Gun Club Rd from OR 51-Monmouth St to Hoffman Rd	0.87	1.96	2.77	No
10	13 th Street from OR 51-Monmouth Street to south city limits	0.26	4.91	1.70	No
11	7 th Street from OR 51-Monmouth Street to south city limits	1.02	1.42	2.77	No
12	4 th Street from A Street to OR 51-Monmouth Street	0.19	2.22	1.70	No
13	4 th Street from OR 51-Monmouth Street to Spruce Street	0.56	3.91	1.70	Yes
14	Stryker Road from OR 51-Main Street to Polk Street	0.99	0.76	1.70	No
15	Hoffman-Polk from Gun Club Road to OR 51-Main Street	1.15	1.59	2.77	No

16	Picture Street from Gun Club Road to 12 th Street	0.19	2.81	1.70	No
17	Williams Street from Ash Street to OR 51-Main Street	0.24	7.75	1.70	No
18	G Street from 7 th Street to OR 51-Main Street	0.44	2.52	1.70	No
19	Spruce Street from 6 th Street to 4 th Street	0.18	6.09	1.70	No
20	River Road from Main Street to East City Limits	0.25	2.42	1.70	No

As shown in Table 10, the segment of OR 51-Monmouth Street from the west city limits to Gun Club Road and the segment of 4th Street from OR 51-Monmouth Street to Spruce Street currently exceed the crash rates for similar facilities throughout the state. *Attachment C contains the segment crash analysis worksheet.*

It should also be noted that one fatal crash occurred along the segment of Stryker Road from OR 51-Main Street to Polk Street over the five-year period. The crash occurred at the Stryker Road/Stinson Street intersection in April 2014 on a rainy, wet, day. The crash occurred when a motorist entered the intersection from a private driveway on the east side of Stryker Road and was struck by a motorist traveling south on Stryker Road. Based on the crash data, the crash occurred because the westbound motorist failed to yield the right-of-way to the southbound motorist.

Safety Priority Index System

The Safety Priority Index System (SPIS) was developed by ODOT to identify sites along state and local roads where potential safety issues warrant further investigation. The SPIS compares the total number of crashes reported on city streets, county roads, and state highways and generates a list of sites (intersections and roadway segments) with calculated SPIS scores. The scores are based on crash frequency, crash rate, and crash severity. SPIS sites with scores in the top five percent are investigated by ODOT staff and reported to the Federal Highway Administration (FHWA). Per the most recent SPIS list (2017), there are no sites within Independence in the top five or ten percent of SPIS sites; however, there is one site in the top 15 percent. The site is located along Monmouth Street at the eastbound approach to 16th Street. Given that it is in the top 15 percent, no additional data is available for the site.

Additional Safety Concerns

Additional safety concerns identified through discussions with Independence Planning Commission, include:

- The 7th Street intersection with Monmouth needs some form of traffic control.
- It is difficult to turn left onto Monmouth at certain times of the day from 11th Street.
- The turn from River Road south onto Main Street is a difficult turn. Tough to find a gap, and speeds of northbound traffic can sometimes be too fast. Northbound Main Street/Corvallis Road drops from 50 to 35 right before the bridge, and sometimes people do not slow before the bridge.
- The three way stop in downtown has many close calls for pedestrians.
- Access from dog park has poor visibility at Main.
- Osprey Lane gets blocked by traffic backups at 3-way stop.
- The Gun Club and Hoffman intersection is not stellar. The speed on Hoffman is 35 to 40 mph, and people have to dart between traffic.

- The Polk and Main Street intersection is difficult. A lot of activity comes into the small intersection – truck travel, pedestrian traffic, bus stop nearby, etc. People potentially cut by on Stryker to get around the intersection.
- Downtown intersections sometimes unsafe for pedestrians. Sometimes people don't stop.
- 6th has lots of cars between Monmouth and G, and visibility on side streets is poor.
- The three-way stop at Main and Monmouth is not safe for pedestrians.

ACCESS MANAGEMENT ANALYSIS

ODOT and the City of Independence have adopted access spacing standards for study area roadways. This analysis identifies ODOT's access spacing standards, as defined in Oregon Administrative Rule (OAR) 734 Division 51, and the City's access spacing standards as defined in the 2007 Independence TSP. This analysis also identifies the access points along ODOT and City arterial and collector streets that do not meet their applicable standards.

ODOT Access Spacing Standards

Access spacing standards for approaches to state highways are based on the classification of the highway and differ depending on posted speed and AADT. Within Independence, OR 51 is classified as a district highway with speeds that range from 20 to 45 MPH, and all AADTs are above 5,000 vehicles. Table 11 summarizes ODOT's current access spacing standards for OR 51 within Independence.

Table 11: ODOT Access Spacing Standards

Posted Speed (MPH)	Urban Areas Access Management Spacing Standards for >5,000 AADT (Feet)
25 and lower	250
30 and 35	350
40 and 45	500
50	550
55 or higher	700

There are six segments with different posted speeds along OR 51 within Independence. Table 12 summarizes the posted speeds, segment lengths, the total number of intersections and driveways located along the segments, and the average intersection and driveway spacing. As shown, average intersection spacing generally meets ODOT's access spacing standards, and average driveway spacing generally exceeds ODOT's access spacing standards. It should be noted that there may be intersections and driveways that meet the standards within each segment where the average spacing exceeds the standards.

Table 12: OR 51 Access Spacing Analysis

Roadway Segments	Posted Speed	Segment Length (ft)	Intersections	Average Intersection Spacing (ft)	Driveways	Average Driveway Spacing (ft)
OR 51 – Main Street						
Stryker Rd to North of Polk St	45	2,440	3	813	28	87
North of Polk St to B St	35	3,690	7	527	17	217

B St to Monmouth Street	20	670	2	335	3	223
OR 51 – Monmouth Street						
Main Street to 3 rd Street	20	750	2	375	9	83
3 rd Street to 10 th Street	25	2,730	7	390	30	91
10 th Street to west UGB	30	4,800	7	686	57	84

City Access Spacing Standards

The City's access spacing standards are determined by functional classification and posted speed and apply to driveways and intersections. Table 13 summarizes the City's access spacing standards.

Table 13: City Access Spacing Standards

Functional Classification	Minimum Posted Speed	Minimum Spacing Between Driveways	Spacing Between Intersections
Major Arterial	35 – 50 MPH	250 feet	1,320 feet
Minor Arterial	35 – 50 MPH	250 feet	250 feet
Major Collector	25 – 40 MPH	100-150 feet	250 feet
Collector	25 – 40 MPH	100-150 feet	250 feet

Table 14 below lists the non-state arterial and collector streets in Independence, including posted speeds, segment lengths, the total number of intersections and driveways located along the segments, and the average intersection and driveway spacing. As shown, average intersection spacing generally meets the City's access spacing standards, and average driveway spacing generally exceeds the City's access spacing standards. It should be noted that there may be intersections and driveways that meet the standards within each segment where the average spacing exceeds the standards.

Table 14: City Roadway Access Spacing Analysis

Roadway Segments	Posted Speed	Segment Length (feet)	Inter-sections	Average Intersection Spacing (ft)	Driveways	Average Driveway Spacing (ft)
Major Arterials						
Main St – OR 51 to F St	20	1,000	4	50	15	67
Main St – F St to S of River Rd	30	1,200	4	300	11	109
Main St – S of River Rd to UGB	40	1,960	3	653	39	50
Minor Arterials						
Gun Club Rd – OR 51 to Hoffman Rd	30	4,570	12	381	52	88
Polk St – OR 51 to Stryker Rd	25	1,990	6	332	27	74
Hoffman Rd – Stryker Rd to Gun Club Rd	35	4,100	4	1,025	7	586
Collectors						
Stryker Rd – Polk St to OR 51	35	5,180	14	370	29	179
Ash St – Polk St to A St	25	2,420	7	346	30	81
Williams St – Ash St to OR 51	N/A	1,280	5	256	26	49

4 th St – A St to OR 51	20	1,020	4	255	16	64
Picture St – Gun Club Rd to End of Road	N/A	1,430	4	358	32	45
16 th St – OR 51 to North UGB	25	3,360	6	560	23	146
16 th St – OR 51 to South UGB	25	1,000	2	500	7	143
13 th St – OR 51 to UGB	N/A	5,350	4	1,338	31	173
7 th St – OR 51 to UGB	N/A	5,360	14	83	142	38
G St – 7 th St to OR 51	N/A	2,330	6	388	42	55
Spruce Ave – 6 th St to 4 th St	N/A	940	5	188	15	63

State Highway Approach Permits

The state highway approach permits information was obtained from the ODOT TransGIS database. Table 15 shows the number of approach permits recorded along OR 51 in Independence.

Table 15: State Highway Approach Permits

Street	From	To	Number of Approach Permits
OR 51 -Main Street	Stryker Road	Polk Street	23
OR 51 -Main Street	Polk Street	Picture Street	0
OR 51 -Main Street	Picture Street	Monmouth Street	3
OR 51 -Monmouth Street	Western UGB	10th Street	37
OR 51 -Monmouth Street	10th Street	Main Street	0

ENVIRONMENTAL ANALYSIS

Title VI and Environmental Justice (EJ) population information is provided in *Tech Memo 3A: Transportation Inventory, Attachment A*. The information will be used to identifying transportation system improvements that will provide the most benefits to identified populations. Six population groups are considered for transportation impact susceptibility, representing those who may rely more heavily on public infrastructure or transit for access to day-to-day needs and jobs. They include minority groups, low-income populations, populations under 17 or over 64 years of age, low-English proficiency households, and people with disabilities. See *Tech Memo 3A: Transportation Inventory, Attachment A* for additional information.

ATTACHMENTS

- A. Existing Traffic Conditions Worksheets
- B. Detailed Pedestrian Level of Traffic Stress Results
- C. Crash Data

Attachment A Existing Traffic Conditions
Worksheets

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	93	11	12	397	387	103
Future Vol, veh/h	93	11	12	397	387	103
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	-	190	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	2	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	1	0	0	5	2	0
Mvmt Flow	95	11	12	405	395	105

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	877	448	500	0	0
Stage 1	448	-	-	-	-
Stage 2	429	-	-	-	-
Critical Hdwy	6.41	6.2	4.1	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.3	2.2	-	-
Pot Cap-1 Maneuver	320	615	1075	-	-
Stage 1	646	-	-	-	-
Stage 2	659	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	316	615	1075	-	-
Mov Cap-2 Maneuver	316	-	-	-	-
Stage 1	639	-	-	-	-
Stage 2	659	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1075	-	333	-	-
HCM Lane V/C Ratio	0.011	-	0.319	-	-
HCM Control Delay (s)	8.4	-	20.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	1.3	-	-

Intersection												
Int Delay, s/veh	8.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	104	2	89	6	2	4	74	329	4	8	363	117
Future Vol, veh/h	104	2	89	6	2	4	74	329	4	8	363	117
Conflicting Peds, #/hr	0	0	9	9	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	6	0	2	0	0	0	1	5	0	0	2	3
Mvmt Flow	112	2	96	6	2	4	80	354	4	9	390	126

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	990	989	462	1045	1050	356	516	0	0	358	0	0
Stage 1	471	471	-	516	516	-	-	-	-	-	-	-
Stage 2	519	518	-	529	534	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	222	249	600	209	229	693	1055	-	-	1212	-	-
Stage 1	566	563	-	546	538	-	-	-	-	-	-	-
Stage 2	533	536	-	537	528	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	205	229	595	162	210	693	1055	-	-	1212	-	-
Mov Cap-2 Maneuver	205	229	-	162	210	-	-	-	-	-	-	-
Stage 1	523	559	-	505	497	-	-	-	-	-	-	-
Stage 2	487	495	-	442	524	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	43		21.7		1.6		0.1	
HCM LOS	E		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1055	-	-	293	229	1212	-	-
HCM Lane V/C Ratio	0.075	-	-	0.716	0.056	0.007	-	-
HCM Control Delay (s)	8.7	-	-	43	21.7	8	-	-
HCM Lane LOS	A	-	-	E	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5.1	0.2	0	-	-

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	10	1	0	0	5	413	2	0	460	6
Future Vol, veh/h	7	0	10	1	0	0	5	413	2	0	460	6
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	2	2	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	10	0	0	0	0	6	0	0	2	17
Mvmt Flow	8	0	11	1	0	0	5	449	2	0	500	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	965	968	505	971	970	452	508	0	0	453	0	0
Stage 1	505	505	-	462	462	-	-	-	-	-	-	-
Stage 2	460	463	-	509	508	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.3	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.39	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	236	256	551	234	255	612	1067	-	-	1118	-	-
Stage 1	553	544	-	584	568	-	-	-	-	-	-	-
Stage 2	585	568	-	550	542	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	235	254	550	228	253	611	1066	-	-	1116	-	-
Mov Cap-2 Maneuver	235	254	-	228	253	-	-	-	-	-	-	-
Stage 1	549	543	-	579	563	-	-	-	-	-	-	-
Stage 2	581	563	-	539	541	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		20.9		0.1		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1066	-	-	354	228	1116	-	-
HCM Lane V/C Ratio	0.005	-	-	0.052	0.005	-	-	-
HCM Control Delay (s)	8.4	0	-	15.7	20.9	0	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-	-

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↕			↕			↕		
Traffic Vol, veh/h	0	0	0	3	2	13	15	373	12	15	387	34
Future Vol, veh/h	0	0	0	3	2	13	15	373	12	15	387	34
Conflicting Peds, #/hr	6	0	10	10	0	6	7	0	2	2	0	7
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	3	0
Mvmt Flow	0	0	0	3	2	14	16	410	13	16	425	37

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	937	952	425	469	0	0
Stage 1	451	451	-	-	-	-
Stage 2	486	501	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	4.1
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	2.2
Pot Cap-1 Maneuver	296	261	634	1103	-	1145
Stage 1	646	574	-	-	-	-
Stage 2	623	546	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	281	0	629	1103	-	1143
Mov Cap-2 Maneuver	281	0	-	-	-	-
Stage 1	632	0	-	-	-	-
Stage 2	606	0	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0.3	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBRWBLn1	SBL	SBT	SBR
Capacity (veh/h)	1103	-	-	510	1143	-
HCM Lane V/C Ratio	0.015	-	-	0.039	0.014	-
HCM Control Delay (s)	8.3	0	-	12.3	8.2	0
HCM Lane LOS	A	A	-	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑	↑	
Traffic Vol, veh/h	180	170	223	215	208	175
Future Vol, veh/h	180	170	223	215	208	175
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	3	1	0	4	4	2
Mvmt Flow	189	179	235	226	219	184
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	18.6	24.3	18
HCM LOS	C	C	C

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	51%	51%	0%
Vol Thru, %	49%	0%	54%
Vol Right, %	0%	49%	46%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	438	350	383
LT Vol	223	180	0
Through Vol	215	0	208
RT Vol	0	170	175
Lane Flow Rate	461	368	403
Geometry Grp	1	1	1
Degree of Util (X)	0.747	0.619	0.632
Departure Headway (Hd)	5.836	6.048	5.643
Convergence, Y/N	Yes	Yes	Yes
Cap	613	593	633
Service Time	3.918	4.13	3.73
HCM Lane V/C Ratio	0.752	0.621	0.637
HCM Control Delay	24.3	18.6	18
HCM Lane LOS	C	C	C
HCM 95th-tile Q	6.6	4.2	4.5

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	387	40	14	483	3	40	15	15	3	27	36
Future Vol, veh/h	41	387	40	14	483	3	40	15	15	3	27	36
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	1	0	0	2	0	0	0	20	0	0	0
Mvmt Flow	46	430	44	16	537	3	44	17	17	3	30	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	546	0	0	476	0	0	1152	1124	456	1140	1145	545
Stage 1	-	-	-	-	-	-	546	546	-	577	577	-
Stage 2	-	-	-	-	-	-	606	578	-	563	568	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.1	6.5	6.4	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.5	4	3.48	3.5	4	3.3
Pot Cap-1 Maneuver	1023	-	-	1097	-	-	176	207	569	180	201	542
Stage 1	-	-	-	-	-	-	526	521	-	506	505	-
Stage 2	-	-	-	-	-	-	487	504	-	514	510	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1017	-	-	1095	-	-	134	189	567	152	183	539
Mov Cap-2 Maneuver	-	-	-	-	-	-	134	189	-	152	183	-
Stage 1	-	-	-	-	-	-	492	488	-	472	491	-
Stage 2	-	-	-	-	-	-	414	490	-	451	477	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0.2			41.8			22.2		
HCM LOS							E			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	173	1017	-	-	1095	-	-	282
HCM Lane V/C Ratio	0.45	0.045	-	-	0.014	-	-	0.26
HCM Control Delay (s)	41.8	8.7	0	-	8.3	0	-	22.2
HCM Lane LOS	E	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	2.1	0.1	-	-	0	-	-	1

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	475	88	22	619	1	61	0	20	1	1	6
Future Vol, veh/h	7	475	88	22	619	1	61	0	20	1	1	6
Conflicting Peds, #/hr	4	0	12	12	0	4	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	8	516	96	24	673	1	66	0	22	1	1	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	678	0	0	624	0	0	1318	1318	578	1319	1366	678
Stage 1	-	-	-	-	-	-	592	592	-	726	726	-
Stage 2	-	-	-	-	-	-	726	726	-	593	640	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	923	-	-	967	-	-	136	159	519	135	149	456
Stage 1	-	-	-	-	-	-	496	497	-	419	433	-
Stage 2	-	-	-	-	-	-	419	433	-	496	473	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	919	-	-	956	-	-	126	148	512	123	139	454
Mov Cap-2 Maneuver	-	-	-	-	-	-	126	148	-	123	139	-
Stage 1	-	-	-	-	-	-	484	485	-	412	414	-
Stage 2	-	-	-	-	-	-	395	414	-	468	462	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.3			55.1			18.3		
HCM LOS							F			C		

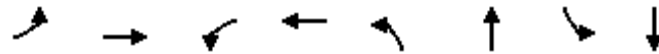
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	155	919	-	-	956	-	-	280
HCM Lane V/C Ratio	0.568	0.008	-	-	0.025	-	-	0.031
HCM Control Delay (s)	55.1	8.9	0	-	8.9	0	-	18.3
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	2.9	0	-	-	0.1	-	-	0.1

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	614	50	26	660	21	32
Future Vol, veh/h	614	50	26	660	21	32
Conflicting Peds, #/hr	0	4	4	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	2	4	1	0	0
Mvmt Flow	675	55	29	725	23	35

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	734	0	1492 707
Stage 1	-	-	-	-	707 -
Stage 2	-	-	-	-	785 -
Critical Hdwy	-	-	4.14	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.236	-	3.5 3.3
Pot Cap-1 Maneuver	-	-	862	-	137 439
Stage 1	-	-	-	-	493 -
Stage 2	-	-	-	-	453 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	859	-	132 437
Mov Cap-2 Maneuver	-	-	-	-	271 -
Stage 1	-	-	-	-	491 -
Stage 2	-	-	-	-	437 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	17.2
HCM LOS			C





















Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	352	-	-	859	-
HCM Lane V/C Ratio	0.165	-	-	0.033	-
HCM Control Delay (s)	17.2	-	-	9.3	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

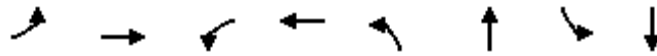


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	508	21	640	89	92	152	158
v/c Ratio	0.25	0.48	0.04	0.71	0.41	0.25	0.59	0.42
Control Delay	6.3	10.9	4.9	18.8	33.3	23.4	38.3	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	10.9	4.9	18.8	33.3	23.4	38.3	21.8
Queue Length 50th (ft)	13	83	2	193	36	28	64	40
Queue Length 95th (ft)	37	264	11	413	85	72	134	99
Internal Link Dist (ft)		1366		439		96		4493
Turn Bay Length (ft)	145		150		100		50	
Base Capacity (vph)	682	1210	766	1127	487	800	580	777
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.42	0.03	0.57	0.18	0.12	0.26	0.20
Intersection Summary								

Independence TSP Update
9: Gun Club Rd & Monmouth St

Existing 2019 Traffic Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	452	30	20	487	121	85	63	25	144	67	83
Future Volume (veh/h)	98	452	30	20	487	121	85	63	25	144	67	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.98		0.97	0.97		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1736	1736	1750	1736	1736	1750	1723	1723	1750	1750	1750
Adj Flow Rate, veh/h	103	476	32	21	513	127	89	66	26	152	71	87
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	1	1	0	2	2	0	0	0
Cap, veh/h	395	893	60	492	688	170	283	260	102	345	157	192
Arrive On Green	0.07	0.56	0.56	0.02	0.51	0.51	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1641	1605	108	1667	1340	332	1221	1163	458	1290	701	859
Grp Volume(v), veh/h	103	0	508	21	0	640	89	0	92	152	0	158
Grp Sat Flow(s),veh/h/ln	1641	0	1713	1667	0	1671	1221	0	1621	1290	0	1560
Q Serve(g_s), s	1.7	0.0	11.5	0.3	0.0	18.5	4.2	0.0	2.9	6.7	0.0	5.4
Cycle Q Clear(g_c), s	1.7	0.0	11.5	0.3	0.0	18.5	9.5	0.0	2.9	9.6	0.0	5.4
Prop In Lane	1.00		0.06	1.00		0.20	1.00		0.28	1.00		0.55
Lane Grp Cap(c), veh/h	395	0	953	492	0	858	283	0	362	345	0	348
V/C Ratio(X)	0.26	0.00	0.53	0.04	0.00	0.75	0.31	0.00	0.25	0.44	0.00	0.45
Avail Cap(c_a), veh/h	819	0	1256	995	0	1226	608	0	793	688	0	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.0	0.0	8.6	6.6	0.0	11.8	24.7	0.0	19.6	23.6	0.0	20.6
Incr Delay (d2), s/veh	0.3	0.0	2.1	0.0	0.0	4.9	0.5	0.0	0.3	0.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	4.0	0.1	0.0	6.8	1.2	0.0	1.1	2.0	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	0.0	10.7	6.6	0.0	16.7	25.2	0.0	19.9	24.2	0.0	21.3
LnGrp LOS	A	A	B	A	A	B	C	A	B	C	A	C
Approach Vol, veh/h		611			661			181			310	
Approach Delay, s/veh		10.5			16.4			22.5			22.7	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	38.1		17.7	8.1	35.5		17.7				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	20.0	45.0		30.0	20.0	45.0		30.0				
Max Q Clear Time (g_c+I1), s	2.3	13.5		11.6	3.7	20.5		11.5				
Green Ext Time (p_c), s	0.0	10.7		1.1	0.2	11.0		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				16.1								
HCM 6th LOS				B								



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	572	106	626	17	160	43	147
v/c Ratio	0.18	0.63	0.24	0.68	0.07	0.53	0.18	0.47
Control Delay	6.5	17.4	6.8	18.1	27.0	19.0	28.0	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	17.4	6.8	18.1	27.0	19.0	28.0	24.2
Queue Length 50th (ft)	10	182	15	203	6	13	15	26
Queue Length 95th (ft)	31	371	43	410	26	84	51	108
Internal Link Dist (ft)		1726		1366		496		3282
Turn Bay Length (ft)	250		215		110		215	
Base Capacity (vph)	710	1391	738	1400	474	813	468	821
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.41	0.14	0.45	0.04	0.20	0.09	0.18

Intersection Summary

Independence TSP Update
10: 16th St & Monmouth St

Existing 2019 Traffic Conditions
Weekday PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	532	28	104	571	42	17	31	125	42	44	100
Future Volume (veh/h)	72	532	28	104	571	42	17	31	125	42	44	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1723	1723	1750	1736	1736	1750	1709	1709	1750	1750	1750
Adj Flow Rate, veh/h	73	543	29	106	583	43	17	32	128	43	45	102
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	2	2	0	1	1	0	3	3	0	0	0
Cap, veh/h	387	814	43	432	818	60	245	44	175	233	80	181
Arrive On Green	0.06	0.50	0.50	0.06	0.51	0.51	0.02	0.15	0.15	0.04	0.17	0.17
Sat Flow, veh/h	1654	1618	86	1667	1596	118	1667	293	1172	1667	469	1063
Grp Volume(v), veh/h	73	0	572	106	0	626	17	0	160	43	0	147
Grp Sat Flow(s),veh/h/ln	1654	0	1704	1667	0	1714	1667	0	1465	1667	0	1532
Q Serve(g_s), s	1.3	0.0	16.6	1.9	0.0	18.6	0.6	0.0	6.9	1.4	0.0	5.8
Cycle Q Clear(g_c), s	1.3	0.0	16.6	1.9	0.0	18.6	0.6	0.0	6.9	1.4	0.0	5.8
Prop In Lane	1.00		0.05	1.00		0.07	1.00		0.80	1.00		0.69
Lane Grp Cap(c), veh/h	387	0	858	432	0	878	245	0	218	233	0	261
V/C Ratio(X)	0.19	0.00	0.67	0.25	0.00	0.71	0.07	0.00	0.73	0.18	0.00	0.56
Avail Cap(c_a), veh/h	794	0	1543	827	0	1552	588	0	663	541	0	694
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.3	0.0	12.3	9.0	0.0	12.4	22.2	0.0	26.9	22.7	0.0	25.2
Incr Delay (d2), s/veh	0.2	0.0	3.4	0.2	0.0	4.1	0.1	0.0	3.5	0.3	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.2	0.6	0.0	7.0	0.2	0.0	2.5	0.6	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.5	0.0	15.7	9.2	0.0	16.5	22.3	0.0	30.4	22.9	0.0	26.7
LnGrp LOS	A	A	B	A	A	B	C	A	C	C	A	C
Approach Vol, veh/h		645			732			177				190
Approach Delay, s/veh		15.0			15.5			29.7				25.8
Approach LOS		B			B			C				C
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	37.3	5.3	15.3	7.7	37.9	6.7	13.9				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	20.0	60.0	15.0	30.0	20.0	60.0	15.0	30.0				
Max Q Clear Time (g_c+I1), s	3.9	18.6	2.6	7.8	3.3	20.6	3.4	8.9				
Green Ext Time (p_c), s	0.2	12.0	0.0	0.7	0.1	13.3	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay				17.9								
HCM 6th LOS				B								

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	269	65	64	244	44	40
Future Vol, veh/h	269	65	64	244	44	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	160	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	0	2	3	2	0
Mvmt Flow	313	76	74	284	51	47

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	389	0	783
Stage 1	-	-	-	-	351
Stage 2	-	-	-	-	432
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1170	-	362
Stage 1	-	-	-	-	713
Stage 2	-	-	-	-	655
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1170	-	339
Mov Cap-2 Maneuver	-	-	-	-	339
Stage 1	-	-	-	-	713
Stage 2	-	-	-	-	614

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	339	697	-	-	1170	-
HCM Lane V/C Ratio	0.151	0.067	-	-	0.064	-
HCM Control Delay (s)	17.5	10.5	-	-	8.3	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0.2	-

Intersection						
Int Delay, s/veh	5.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	175	134	162	237	68	73
Future Vol, veh/h	175	134	162	237	68	73
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	87	87	87	87	87	87
Heavy Vehicles, %	3	1	0	3	3	3
Mvmt Flow	201	154	186	272	78	84

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	355	0	922 278
Stage 1	-	-	-	-	278 -
Stage 2	-	-	-	-	644 -
Critical Hdwy	-	-	4.1	-	6.43 6.23
Critical Hdwy Stg 1	-	-	-	-	5.43 -
Critical Hdwy Stg 2	-	-	-	-	5.43 -
Follow-up Hdwy	-	-	2.2	-	3.527 3.327
Pot Cap-1 Maneuver	-	-	1215	-	299 758
Stage 1	-	-	-	-	767 -
Stage 2	-	-	-	-	521 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1215	-	245 758
Mov Cap-2 Maneuver	-	-	-	-	245 -
Stage 1	-	-	-	-	767 -
Stage 2	-	-	-	-	427 -

Approach	EB	WB	NB
HCM Control Delay, s	0	3.5	21.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	377	-	-	1215	-
HCM Lane V/C Ratio	0.43	-	-	0.153	-
HCM Control Delay (s)	21.6	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.1	-	-	0.5	-

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	105	200	244	19	14	123
Future Vol, veh/h	105	200	244	19	14	123
Conflicting Peds, #/hr	1	0	0	1	104	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	86	86	86	86	86	86
Heavy Vehicles, %	11	4	2	6	33	1
Mvmt Flow	122	233	284	22	16	143

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	307	0	-	0	877 296
Stage 1	-	-	-	-	296 -
Stage 2	-	-	-	-	581 -
Critical Hdwy	4.21	-	-	-	6.73 6.21
Critical Hdwy Stg 1	-	-	-	-	5.73 -
Critical Hdwy Stg 2	-	-	-	-	5.73 -
Follow-up Hdwy	2.299	-	-	-	3.797 3.309
Pot Cap-1 Maneuver	1204	-	-	-	282 746
Stage 1	-	-	-	-	689 -
Stage 2	-	-	-	-	503 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1203	-	-	-	249 745
Mov Cap-2 Maneuver	-	-	-	-	249 -
Stage 1	-	-	-	-	608 -
Stage 2	-	-	-	-	502 -

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1203	-	-	-	619
HCM Lane V/C Ratio	0.101	-	-	-	0.257
HCM Control Delay (s)	8.3	0	-	-	12.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	209	53	10	187	3	33	3	6	8	3	2
Future Vol, veh/h	2	209	53	10	187	3	33	3	6	8	3	2
Conflicting Peds, #/hr	2	0	0	0	0	2	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	4	4	0	2	0	0	0	0	0	0	0
Mvmt Flow	2	249	63	12	223	4	39	4	7	10	4	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	229	0	0	312	0	0	539	538	281	541	567	229
Stage 1	-	-	-	-	-	-	285	285	-	251	251	-
Stage 2	-	-	-	-	-	-	254	253	-	290	316	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1351	-	-	1260	-	-	456	453	763	455	436	815
Stage 1	-	-	-	-	-	-	727	679	-	758	703	-
Stage 2	-	-	-	-	-	-	755	701	-	722	659	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1348	-	-	1260	-	-	446	446	763	443	429	812
Mov Cap-2 Maneuver	-	-	-	-	-	-	446	446	-	443	429	-
Stage 1	-	-	-	-	-	-	726	678	-	755	694	-
Stage 2	-	-	-	-	-	-	739	692	-	710	658	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.4			13.5			12.9		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	474	1348	-	-	1260	-	-	472
HCM Lane V/C Ratio	0.105	0.002	-	-	0.009	-	-	0.033
HCM Control Delay (s)	13.5	7.7	0	-	7.9	0	-	12.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	1	0	7	0	2	1	38	14	9	59	0
Future Vol, veh/h	0	1	0	7	0	2	1	38	14	9	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	100	0	0	0	0	0	0	0	11	2	0
Mvmt Flow	0	1	0	9	0	2	1	46	17	11	72	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	152	160	72	153	152	56	72	0	0	64	0	0
Stage 1	94	94	-	58	58	-	-	-	-	-	-	-
Stage 2	58	66	-	95	94	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.21	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.3	3.5	4	3.3	2.2	-	-	2.299	-	-
Pot Cap-1 Maneuver	820	586	996	819	743	1016	1541	-	-	1483	-	-
Stage 1	918	661	-	959	851	-	-	-	-	-	-	-
Stage 2	959	682	-	917	821	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	813	580	996	812	736	1015	1541	-	-	1482	-	-
Mov Cap-2 Maneuver	813	580	-	812	736	-	-	-	-	-	-	-
Stage 1	917	656	-	957	849	-	-	-	-	-	-	-
Stage 2	956	681	-	908	814	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	9.3	0.1	1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1541	-	-	580	850	1482	-	-
HCM Lane V/C Ratio	0.001	-	-	0.002	0.013	0.007	-	-
HCM Control Delay (s)	7.3	0	-	11.2	9.3	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	10	4	1	0	17	444	3	2	350	20
Future Vol, veh/h	5	0	10	4	1	0	17	444	3	2	350	20
Conflicting Peds, #/hr	0	0	1	1	0	0	12	0	8	8	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	5	0	11	4	1	0	18	467	3	2	368	21

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	900	909	392	902	918	477	401	0	0	478	0	0
Stage 1	395	395	-	513	513	-	-	-	-	-	-	-
Stage 2	505	514	-	389	405	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	262	277	661	261	274	592	1169	-	-	1095	-	-
Stage 1	634	608	-	548	539	-	-	-	-	-	-	-
Stage 2	553	539	-	639	602	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	254	266	653	250	263	587	1156	-	-	1087	-	-
Mov Cap-2 Maneuver	254	266	-	250	263	-	-	-	-	-	-	-
Stage 1	614	600	-	533	523	-	-	-	-	-	-	-
Stage 2	540	523	-	627	594	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.7		19.6		0.3		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1156	-	-	429	252	1087	-	-
HCM Lane V/C Ratio	0.015	-	-	0.037	0.021	0.002	-	-
HCM Control Delay (s)	8.2	0	-	13.7	19.6	8.3	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	6	55	131	490	336	30
Future Vol, veh/h	6	55	131	490	336	30
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	89	89	89	89	89	89
Heavy Vehicles, %	0	2	1	2	1	3
Mvmt Flow	7	62	147	551	378	34

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1240	395	412	0	-	0
Stage 1	395	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	195	654	1152	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	159	654	1152	-	-	-
Mov Cap-2 Maneuver	159	-	-	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	425	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1152	-	501	-	-
HCM Lane V/C Ratio	0.128	-	0.137	-	-
HCM Control Delay (s)	8.6	0	13.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.5	-	-

Intersection												
Int Delay, s/veh	27.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	3	1	92	9	392	6	161	91	241	149	16
Future Vol, veh/h	6	3	1	92	9	392	6	161	91	241	149	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	2	0	4	4	2	3	0
Mvmt Flow	6	3	1	98	10	417	6	171	97	256	159	17





















Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1125	963	168	917	923	223	176	0	0	271	0	0
Stage 1	680	680	-	235	235	-	-	-	-	-	-	-
Stage 2	445	283	-	682	688	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	6.7	6.1	6.02	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	184	258	881	282	301	827	1412	-	-	1292	-	-
Stage 1	444	454	-	793	733	-	-	-	-	-	-	-
Stage 2	596	681	-	478	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	73	199	881	230	233	825	1412	-	-	1288	-	-
Mov Cap-2 Maneuver	73	199	-	230	233	-	-	-	-	-	-	-
Stage 1	442	354	-	787	727	-	-	-	-	-	-	-
Stage 2	289	676	-	369	379	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	44.4		59.6		0.2		5	
HCM LOS	E		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1412	-	-	102	540	1288	-	-
HCM Lane V/C Ratio	0.005	-	-	0.104	0.971	0.199	-	-
HCM Control Delay (s)	7.6	0	-	44.4	59.6	8.5	0	-
HCM Lane LOS	A	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	13.1	0.7	-	-





















Independence TSP Update
9: Gun Club Rd & Monmouth St

Existing 2019 Traffic Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	452	30	20	487	121	85	63	25	144	67	83
Future Volume (vph)	98	452	30	20	487	121	85	63	25	144	67	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1627	1715		1661	1662		1623	1637		1643	1561	
Flt Permitted	0.27	1.00		0.39	1.00		0.60	1.00		0.70	1.00	
Satd. Flow (perm)	468	1715		689	1662		1017	1637		1206	1561	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	476	32	21	513	127	89	66	26	152	71	87
RTOR Reduction (vph)	0	2	0	0	6	0	0	14	0	0	45	0
Lane Group Flow (vph)	103	506	0	21	634	0	89	78	0	152	113	0
Confl. Peds. (#/hr)	14		3	3		14	15		7	7		15
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	1%	0%	0%	1%	2%	0%	2%	0%	0%	0%	0%
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	43.8	41.9		43.8	38.6		14.7	14.7		14.7	14.7	
Effective Green, g (s)	43.8	41.9		43.8	38.6		14.7	14.7		14.7	14.7	
Actuated g/C Ratio	0.62	0.59		0.62	0.55		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	6.8		2.5	6.1		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	376	1019		454	909		212	341		251	325	
v/s Ratio Prot	c0.02	c0.30		0.00	c0.38			0.05				0.07
v/s Ratio Perm	0.15			0.03			0.09			c0.13		
v/c Ratio	0.27	0.50		0.05	0.70		0.42	0.23		0.61	0.35	
Uniform Delay, d1	6.9	8.2		5.5	11.7		24.2	23.2		25.3	23.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.3		0.0	3.6		1.0	0.2		3.5	0.5	
Delay (s)	7.2	9.5		5.5	15.2		25.2	23.4		28.7	24.3	
Level of Service	A	A		A	B		C	C		C	C	
Approach Delay (s)		9.1			14.9			24.3			26.5	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			15.9			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			70.5			Sum of lost time (s)		12.0				
Intersection Capacity Utilization			72.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Independence TSP Update
10: 16th St & Monmouth St

Existing 2019 Traffic Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	532	28	104	571	42	17	31	125	42	44	100
Future Volume (vph)	72	532	28	104	571	42	17	31	125	42	44	100
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1645	1701		1660	1710		1657	1479		1655	1538	
Flt Permitted	0.27	1.00		0.30	1.00		0.58	1.00		0.52	1.00	
Satd. Flow (perm)	459	1701		527	1710		1019	1479		900	1538	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	73	543	29	106	583	43	17	32	128	43	45	102
RTOR Reduction (vph)	0	1	0	0	1	0	0	110	0	0	62	0
Lane Group Flow (vph)	73	571	0	106	625	0	17	50	0	43	85	0
Confl. Peds. (#/hr)	6		9	9		6	4		7	7		4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	0%	0%	1%	2%	0%	3%	1%	0%	0%	0%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	42.8	37.4		42.8	37.9		13.6	9.9		13.6	11.7	
Effective Green, g (s)	42.8	37.4		42.8	37.9		13.6	9.9		13.6	11.7	
Actuated g/C Ratio	0.59	0.52		0.59	0.52		0.19	0.14		0.19	0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	6.1		2.5	6.1		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	351	878		396	895		208	202		207	248	
v/s Ratio Prot	0.01	0.34		c0.02	c0.37		0.00	0.03		c0.01	c0.06	
v/s Ratio Perm	0.11			0.14			0.01			0.03		
v/c Ratio	0.21	0.65		0.27	0.70		0.08	0.25		0.21	0.34	
Uniform Delay, d1	7.9	12.7		7.7	13.0		24.1	27.9		24.5	26.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	2.8		0.3	3.6		0.1	0.5		0.4	0.6	
Delay (s)	8.1	15.6		7.9	16.6		24.3	28.4		24.9	27.5	
Level of Service	A	B		A	B		C	C		C	C	
Approach Delay (s)		14.7			15.3			28.0			26.9	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.6				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			72.4				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			69.2%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Based on ODOT Analysis Procedures Manual, Volume 2, Chapter 13

INTERSECTION	9. Gun Club Road & Monmouth Street				
CYCLE LENGTH	107				
TOTAL LOST TIME	12				
TOTAL LOST TIME (2025)					
CRITICAL MOVEMENTS	EB (L)	WB (TR)	SB (TR)	NB (L)	
	EXISTING PM				
Adj Flow Rate, (veh/h)	103	640	158	89	
Sat Flow (veh/h)	1641	1672	1560	1221	
Flow Ratio	0.06	0.38	0.10	0.07	
CRITICAL INTERSECTION V/C RATIO	0.70				

INTERSECTION	10. 16th Street & Monmouth Street				
CYCLE LENGTH	141				
TOTAL LOST TIME	16				
TOTAL LOST TIME (2025)					
CRITICAL MOVEMENTS	EB (L)	WB (TR)	NB (TR)	SB (L)	
	EXISTING PM				
Adj Flow Rate, (veh/h)	73	626	159	43	
Sat Flow (veh/h)	1654	1714	1465	1667	
Flow Ratio	0.04	0.37	0.11	0.03	
CRITICAL INTERSECTION V/C RATIO	0.61				

Attachment B Detailed Pedestrian Level of
Traffic Stress Results

Detailed PLTS Analysis Results

Table B1 summarizes the detailed PLTS analysis results for the state highways and the arterial and collector streets within Independence.

Table B1: Detailed PLTS Analysis Result

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
OR 51	Stryker Road	Hanna Road	East	45	3	0-7	0	Fair with sidewalk gaps	0-7	No buffer	Yes	Un-incorporated communities	4
	Stryker Road	Hanna Road	West	45	3	6	0	Fair	5.5-6	No buffer/Landscaped with trees	Yes	Residential/Light industrial	4
	Hanna Road	Polk Street	East	35	3	5.5-6	0	Fair	6	No buffer/Landscaped with trees	Yes	Light industrial	3
	Hanna Road	Polk Street	West	35	3	5.5-6	0	Fair	6	No buffer/Landscaped with trees	Yes	Heavy industrial	4
	Polk Street	B Street	East	35	2-3	0-10	0	Fair/poor with sidewalk gaps	0-6	No buffer	Yes	Residential/Parks and other public facilities	4
	Polk Street	B Street	West	35	2-3	0-6	0	Fair	4-6	No buffer/Landscaped with trees	Yes	Residential	3
OR 51-Main Street	B Street	Monmouth Street	East	20	2	0	7	Good	14	No buffer	Yes	Central business districts/Parks and other public facilities	2

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
	B Street	Monmouth Street	West	20	2	0	7	Good	14	No buffer	Yes	Central business districts	2
Main Street	Monmouth Street	E Street	East	20	2	0	7	Good	10-14	No buffer	Yes	Central business districts	2
	Monmouth Street	E Street	West	20	2	0	7	Good	6-14	No buffer/Landscaped with trees	Yes	Central business districts	2
	E Street	River Road	East	20-30	2	5-6	0-7	Good with sidewalk gaps	0-9	No buffer	Yes	Central business districts/Residential	4
	E Street	River Road	West	20-30	2	0-6	0-7	Good/Fair	6-14	Landscaped/Landscaped with trees	Yes	Central business districts/Residential	2
Corvallis Road	River Road	Southern UGB	East	30	2	0	0	No sidewalk	0	N/A	Partial	Un-incorporated communities	4
	River Road	Southern UGB	West	30	2	0	0-9	Fair with sidewalk gaps	0-6	No buffer	Partial	Residential	4
OR 51-Monmouth Street	Western UGB	10 th Street	North	30	3	5	0	Good	6	No buffer	Yes	Residential/Mixed employment/Strip commercial	3
	Western UGB	10 th Street	South	30	3	5	0	Good	6	No buffer	Yes	Residential/Mixed employment/Strip commercial	3

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
Street	10 th Street	3 rd Street	North	20-25	2-3	0-5	0	Good	5-6	No buffer/ Landscaped with trees	Yes	Residential/Mixed employment	2
	10 th Street	3 rd Street	South	20-25	2-3	0-5	0	Good	5-6	No buffer/ Landscaped with trees	Yes	Residential/Mixed employment	2
	3 rd Street	Main Street	North	20	2	0	0-7	Good with sidewalk gaps	0-10	No buffer	Yes	Central business districts	4
	3 rd Street	Main Street	South	20	2	0	0-7	Good/ Poor	5-10	No buffer/ Landscaped	Yes	Central business districts	3
Gun Club Road	Hoffman Road	Picture Street	East	30	2	0-6	0	Fair	6	Landscaped	Yes	Residential	2
	Hoffman Road	Picture Street	West	30	2	0-8	0	Good with sidewalk gaps	0-6	Landscaped/ Landscaped with trees	Yes	Residential	4
	Picture Street	South of Ash Creek	East	30	2	6-8	0	Good	6-6.5	No buffer/ Landscaped with trees	Yes	Residential	3
	Picture Street	South of Ash Creek	West	30	2	0	0	No sidewalk	0	N/A	Yes	Residential	4
	South of Ash Creek	Monmouth Street	East	30	2	6	0	Good	5-6	No buffer	Yes	Residential	3

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
	South of Ash Creek	Monmouth Street	West	30	2	6	0	Good	6-7	No buffer/Landscaped with trees	Yes	Residential	3
Hoffman Road	Western UGB	Gun Club Road	North	35-40	2	0	0	No sidewalk	0	N/A	No	Un-incorporated communities/Light industrial	4
	Western UGB	Gun Club Road	South	35-40	2	0	0	No sidewalk	0	N/A	No	Residential	4
	Gun Club Road	West of Stryker Road	North	35	2	4	0	Fair with sidewalk gaps	0-6	Landscaped with trees	Yes	Residential/Mixed employment/Light industrial	4
	Gun Club Road	West of Stryker Road	South	35	2	4	0	Fair	6	Landscaped with trees	Yes	Residential/Light industrial	3
Polk Street	West of Stryker Road	Walnut Street	North	25	2	4	0	Fair	6	Landscaped with trees	Yes	Heavy industrial	4
	West of Stryker Road	Walnut Street	South	25	2	4	0	Fair	6	Landscaped with trees	Yes	Light industrial	3
	Walnut Street	OR 51-Main Street	North	25	2	0-4	0	Fair with sidewalk gaps	0-7	No buffer/Landscaped with trees	Yes	Heavy industrial	4
	Walnut Street	OR 51-Main Street	South	25	2	0	0	Fair with sidewalk gaps	0-7	No buffer	Yes	Heavy industrial	4

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
Stryker Street	OR 51	Skyraider Drive	East	35	2	0-5	0	Good with sidewalk gaps	0-6	No buffer	Partial	Residential/Heavy industrial	4
	OR 51	Skyraider Drive	West	35	2	0	0	Good with sidewalk gaps	0-5	Landscaped	Partial	Residential/Un-incorporated communities/Heavy industrial	4
	Skyraider Drive	Polk Street	East	35	2	0-5	0	Good with sidewalk gaps	0-6	No buffer	Yes	Heavy industrial	4
	Skyraider Drive	Polk Street	West	35	2	0	0	Good/Fair	5	No buffer	Yes	Residential	3
Williams Street	Ash Street	OR 51-Main Street	North	25	2	0	0	Fair with sidewalk gaps	0-5	No buffer/Landscaped	No	Residential	4
	Ash Street	OR 51-Main Street	South	25	2	0	0	Fair	5	No buffer	No	Residential	3
Picture Street	Gun Club Road	End of road	North	25	2	0	0	Fair	5	No buffer	Yes	Residential	2
	Gun Club Road	End of road	South	25	2	0	0	Fair	5	No buffer	Yes	Residential	2
Ash Street	Polk Street	Albert Street	East	25	2	0	0	Fair	5-6	No buffer	Yes	Residential/Parks and other public facilities	2

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
Polk Street	Albert Street	West	25	2	0	0	Fair	5-6	No buffer	Yes	Residential/Parks and other public facilities	2	
	4th Street	East	25	2	0	0	Fair	5	No buffer/Landscaped	Yes	Residential/Parks and other public facilities	2	
	4th Street	West	25	2	0	0	Fair with sidewalk gaps	0-5	No buffer	Yes	Residential/Parks and other public facilities	4	
4th Street	Ash Street	B Street	East	25	2	0	0	Poor	5	Landscaped	Yes	Residential	3
	Ash Street	B Street	West	25	2	0	0	Fair	5	Landscaped with trees	Yes	Residential	2
	B Street	I Street	East	25	2	0	0	Fair	5	Landscaped/Landscaped with trees	Yes	Residential	2
	B Street	I Street	West	25	2	0	0-15	Good/Fair	5-7	No buffer/Landscaped with trees	Yes	Residential	2
	I Street	Spruce Avenue	East	25	2	0	0	No sidewalk	0	N/A	Yes	Residential	4
	I Street	Spruce Avenue	West	25	2	0	0	Fair	5	No buffer	Yes	Residential	2
7th Street	Monmouth Street	Southern UGB	East	25	2	0	0	Fair	5	No buffer/Landscaped with trees	Yes	Residential	2

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
13 th Street	Monmouth Street	Southern UGB	West	25	2	0	0	Fair	5	Landscaped/Landscaped with trees	Yes	Residential	2
	Monmouth Street	E Street	East	25	2	0	0	Fair	5	No buffer	Yes	Residential	2
	Monmouth Street	E Street	West	25	2	0	0	Fair	5	No buffer	Yes	Residential/Strip commercial	2
	E Street	Southern City Limits	East	25	1-2	0	0	No sidewalk	0	N/A	Partial	Residential/Un-incorporated communities	4
	E Street	Southern City Limits	West	25	1-2	0	0	Fair	5	No buffer	Partial	Residential	3
	Southern City Limits	Southern UGB	East	25	1	0	0	No sidewalk	0	N/A	No	Un-incorporated communities	4
16 th Street	Southern City Limits	Southern UGB	West	25	1	0	0	No sidewalk	0	N/A	No	Residential	4
	Northern UGB	Monmouth Street	East	25	2	5	0	Good	6	No buffer	Yes	Parks and other public facilities	2
	Northern UGB	Monmouth Street	West	25	2	5	0	Good	6	No buffer	Yes	Residential	2
	Monmouth Street	Southern UGB	East	25	2-3	0-4	0	Good with sidewalk gaps	0-5	No buffer	Partial	Residential/Strip commercial	4

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
	Monmouth Street	Southern UGB	West	25	2-3	5	0	Good/ Fair	5	No buffer	Partial	Residential/Strip commercial	3
G Street	7 th Street	3 rd Street	North	25	2	0	0	Fair	5	Landscaped/ Landscaped with trees	Yes	Residential	2
	7 th Street	3 rd Street	South	25	2	0	0	Fair	5	No buffer/ Landscaped	Yes	Residential	2
	3 rd Street	Main Street	North	25	2	0	0	Fair	5	No buffer/ Landscaped	Yes	Central business districts/ Light industrial	3
	3 rd Street	Main Street	South	25	2	0	0	Fair	5	No buffer	Yes	Residential/ Light industrial	3
Spruce Avenue	6 th Street	4 th Street	North	25	2	0	0	Fair	5	No buffer/ Landscaped with trees	Yes	Residential	2
	6 th Street	4 th Street	South	25	2	0	0	Good/ Fair	5	No buffer/ Landscaped with trees	Yes	Residential	2

Attachment C Crash Data

General & Site Information				Intersection Population Type Crash Rate													
Analyst:		Kittelson															
Agency/Company:		ODOT															
Date:		4/24/20															
Project Name:		Independence TSP Update															
Highway Number and Name:		Hwy 43															
Mile Points:		0-10															
Crash Years Pulled:		2013-2017															
				Sample Alpha													
				Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	
3ST				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.787	9.627
3SG				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4ST				0.568	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.250
4SG				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				Sample Beta													
3ST				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.50082	13.47725
3SG				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4ST				0.31534	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.73530
4SG				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				Threshold Proportions													
3ST				0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.125	0.000	0.000	0.417	0.292
3SG				0.154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.615	0.231
4ST				0.273	0.000	0.000	0.000	0.000	0.000	0.136	0.000	0.045	0.000	0.000	0.000	0.227	0.318
4SG				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000

Excess Proportion with a probability of greater than 0.9																	
Type of Crash																	
MP	Reference Pop	Street 1	Street 2	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	
0.10	3ST	OR 51	Stryker Road												0.58		
0.20	4ST	OR 51	Polk Street														
0.30	4ST	Main Street	Williams Street														
0.40	4ST	Main Street	C Street														
0.50	3ST	Main Street	Monmouth Street														
0.60	4ST	Monmouth Street	4th Street	0.73													
0.70	4ST	Monmouth Street	7th Street														
0.80	4ST	Monmouth Street	13th Street													0.08	
0.90	3SG	Monmouth Street	Gun Club Road														
1.00	4SG	Monmouth Street	16th Street														
1.10	3ST	Hoffman Road	16th Street														
1.20	3ST	Hoffman Road	Gun Club Road														0.21
1.30	3ST	Hoffman Road	Stryker Road														
1.40	4ST	Polk Street	Ash Street														
1.50	3ST	Ash Street	Williams Street														
1.60	4ST	Main Street	D Street														
1.70	3ST	Main Street	G Street														
1.80	4ST	S Main Street	River Road S														0.25

Probability Type of Crash																	
MP	Reference Pop	Street 1	Street 2	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	
0.10	3ST	OR 51	Stryker Road												1.00		
0.20	4ST	OR 51	Polk Street	0.59													
0.30	4ST	Main Street	Williams Street														
0.40	4ST	Main Street	C Street														
0.50	3ST	Main Street	Monmouth Street														
0.60	4ST	Monmouth Street	4th Street	0.99													
0.70	4ST	Monmouth Street	7th Street														
0.80	4ST	Monmouth Street	13th Street														0.92
0.90	3SG	Monmouth Street	Gun Club Road														
1.00	4SG	Monmouth Street	16th Street														
1.10	3ST	Hoffman Road	16th Street												0.36	0.88	
1.20	3ST	Hoffman Road	Gun Club Road												0.69	0.93	
1.30	3ST	Hoffman Road	Stryker Road														
1.40	4ST	Polk Street	Ash Street														
1.50	3ST	Ash Street	Williams Street														
1.60	4ST	Main Street	D Street														
1.70	3ST	Main Street	G Street														
1.80	4ST	S Main Street	River Road S														0.97

Observed Proportions Type of Crash																	
MP	Reference Pop	Street 1	Street 2	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	
0.10	3ST	OR 51	Stryker Road	0	0	0	0	0	0	0	0	0	0	0	1.00	0	1
0.20	4ST	OR 51	Polk Street	0.29	0	0	0	0	0	0	0	0	0	0	0.43	0	0.714285714
0.30	4ST	Main Street	Williams Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.40	4ST	Main Street	C Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.50	3ST	Main Street	Monmouth Street	0	0	0	0	0	0	0.50	0	0	0	0	0	0	0.5
0.60	4ST	Monmouth Street	4th Street	1.00	0	0	0	0	0	0	0	0	0	0	0	0	1
0.70	4ST	Monmouth Street	7th Street	0	0	0	0	0	0	0	0	0	0	0	0	0.40	0.4
0.80	4ST	Monmouth Street	13th Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.90	3SG	Monmouth Street	Gun Club Road	0.15	0	0	0	0	0	0	0	0	0	0	0.62	0.23	0
1.00	4SG	Monmouth Street	16th Street	0	0	0	0	0	0	0	0	0	0	0	1.00	0	1
1.10	3ST	Hoffman Road	16th Street	0.22	0	0	0	0	0	0	0	0	0	0	0.33	0.33	0.888888889
1.20	3ST	Hoffman Road	Gun Club Road	0	0	0	0	0	0	0	0	0	0	0	0.50	0.50	1
1.30	3ST	Hoffman Road	Stryker Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.40	4ST	Polk Street	Ash Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.50	3ST	Ash Street	Williams Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.60	4ST	Main Street	D Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.70	3ST	Main Street	G Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.80	4ST	S Main Street	River Road S	0	0	0	0	0	0	0	0	0	0	0	0	0.57	0.571428571
																	0
																	0

Intersection Crash Data
Type of Crash

MP	Reference Pop	Street 1	Street 2	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	Total
0.10	3ST	OR 51	Stryker Road												4		4
0.20	4ST	OR 51	Polk Street	2						1		1			3		7
0.30	4ST	Main Street	Williams Street														0
0.40	4ST	Main Street	C Street														0
0.50	3ST	Main Street	Monmouth Street							2		1				1	4
0.60	4ST	Monmouth Street	4th Street	2													2
0.70	4ST	Monmouth Street	7th Street	1						1					1	2	5
0.80	4ST	Monmouth Street	13th Street													1	1
0.90	3SG	Monmouth Street	Gun Club Road	2											8	3	13
1.00	4SG	Monmouth Street	16th Street												2		2
1.10	3ST	Hoffman Road	16th Street	2								1			3	3	9
1.20	3ST	Hoffman Road	Gun Club Road												2	2	4
1.30	3ST	Hoffman Road	Stryker Road									1			1	1	3
1.40	4ST	Polk Street	Ash Street														0
1.50	3ST	Ash Street	Williams Street														0
1.60	4ST	Main Street	D Street														0
1.70	3ST	Main Street	G Street														0
1.80	4ST	S Main Street	River Road S	1						1					1	4	7

General & Site Information	
Analyst:	Kittelson
Agency/Company:	ODOT
Date:	4/24/2020
Project Name:	Independence TSP Update

Reference Population Type Crash Rates					
Segment Reference Population Type	Population Type Number	No. of Segs in Reference Population	Sum of Crashes	Sum of MVMT	Avg Crash Rate for Ref Pop.
Principal Arterial	1	6	98	53.2	1.84
Minor Arterial	2	3	36	20.9	1.73
Collector	3	11	33	15.2	2.18
	4				
	5				
	6				

2017 Rate
2.39
2.77
1.7

Critical Rate Calculation												
Segment	Ref. Pop. Type	Begin Milepoint	End Milepoint	5 Year Crash Total	AADT	Segment Length	Pop. Type Number	MVMT	Segment Crash Rate	Ref. Pop. Crash Rate	Critical Rate	Over Critical
1	Principal Arterial			12	7500	0.82	1	11	1.07	1.84	2.55	Under
2	Principal Arterial			10	7700	0.62	1	9	1.14	1.84	2.65	Under
3	Principal Arterial			5	8200	0.44	1	7	0.76	1.84	2.79	Under
4	Principal Arterial			35	12200	0.39	1	9	4.06	1.84	2.66	Over
5	Principal Arterial			17	9800	0.61	1	11	1.55	1.84	2.56	Under
6	Principal Arterial			19	8600	0.44	1	7	2.72	1.84	2.76	Under
7	Collector			3	3300	0.34	3	2	1.48	2.18	4.13	Under
8	Collector			2	3500	0.20	3	1	1.60	2.18	4.75	Under
9	Minor Arterial			18	5800	0.87	2	9	1.96	1.73	2.50	Under
10	Collector			3	1300	0.26	3	1	4.91	2.18	6.10	Under
11	Minor Arterial			5	1900	1.02	2	4	1.42	1.73	3.02	Under
12	Collector			1	1300	0.19	3	0	2.22	2.18	6.91	Under
13	Collector			6	1500	0.56	3	2	3.91	2.18	4.46	Under
14	Collector			3	2200	0.99	3	4	0.76	2.18	3.52	Under
15	Minor Arterial			13	3900	1.15	2	8	1.59	1.73	2.54	Under
16	Collector			1	1000	0.19	3	0	2.81	2.18	7.66	Under
17	Collector			1	300	0.24	3	0	7.75	2.18	12.80	Under
18	Collector			2	1000	0.44	3	1	2.52	2.18	5.53	Under
19	Collector			2	1000	0.18	3	0	6.09	2.18	7.93	Under
20	Collector			9	8300	0.25	3	4	2.42	2.18	3.57	Under
21												
22												
23												