

Appendix E

TRAFFIC IMPACT ASSESSMENT

LAKE OF THE OZARKS CASINO RESORT

TRAFFIC IMPACT ASSESSMENT

PREPARED FOR

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EXECUTIVE SUMMARY

PROJECT

A commercial development has been proposed for an existing parcel in Osage Beach, Missouri that has Bagnell Dam Boulevard run along its southern border and Ozark Beach Parkway run along its eastern border. Two alternatives will be analyzed in the report. Alternative A will see the development of a 750 slot machine full-service casino. Alternative B will see the development of a 100 room hotel with a variety of amenities. It is anticipated that Alternative A will utilize two access points, one onto Bagnell Dam Boulevard and one onto Osage Beach Parkway. Alternative B will use one access point onto Bagnell Dam Boulevard.

RESULTS

The results of the study showed that in the existing condition, the signalized intersection of Osage Beach Parkway & Bagnell Dam Boulevard operates at a level of service C overall. The intersection of Osage Beach Parkway & Kestrel Lane operates at a level of service A overall. The signalized intersection of Osage Beach Parkway & Horseshoe Bend Parkway operates at a level of service C overall.

The results of the study for Alternative A showed that in 2025, the intersection of Access P1 & Bagnell Dam Boulevard will operate at a level of service A overall. The signalized intersection of Osage Beach Parkway & Bagnell Dam Boulevard will operate at a level of service C overall. The intersection of Osage Beach Parkway & Access P2 / Kestrel Lane will operate at a level of service A overall. The signalized intersection of Osage Beach Parkway & Horseshoe Bend Parkway will operate at a level of service C overall.

The results of the study for Alternative B showed that in 2025, the intersection of Access P1 & Bagnell Dam Boulevard will operate at a level of service A overall. The signalized intersection of Osage Beach Parkway & Bagnell Dam Boulevard will operate at a level of service C overall. The signalized intersection of Osage Beach Parkway & Horseshoe Bend Parkway will operate at a level of service C overall.

RECOMMENDATIONS

Roadway Improvements 2025 (Alternative A) The analysis of the proposed intersections revealed that the intersection of Access P1 & Bagnell Dam Boulevard will require a designated westbound right turn lane.

Roadway Improvements 2025 (Alternative B) The analysis of the proposed intersections revealed that no improvements were necessary and that the intersections can adequately accommodate the additional traffic.

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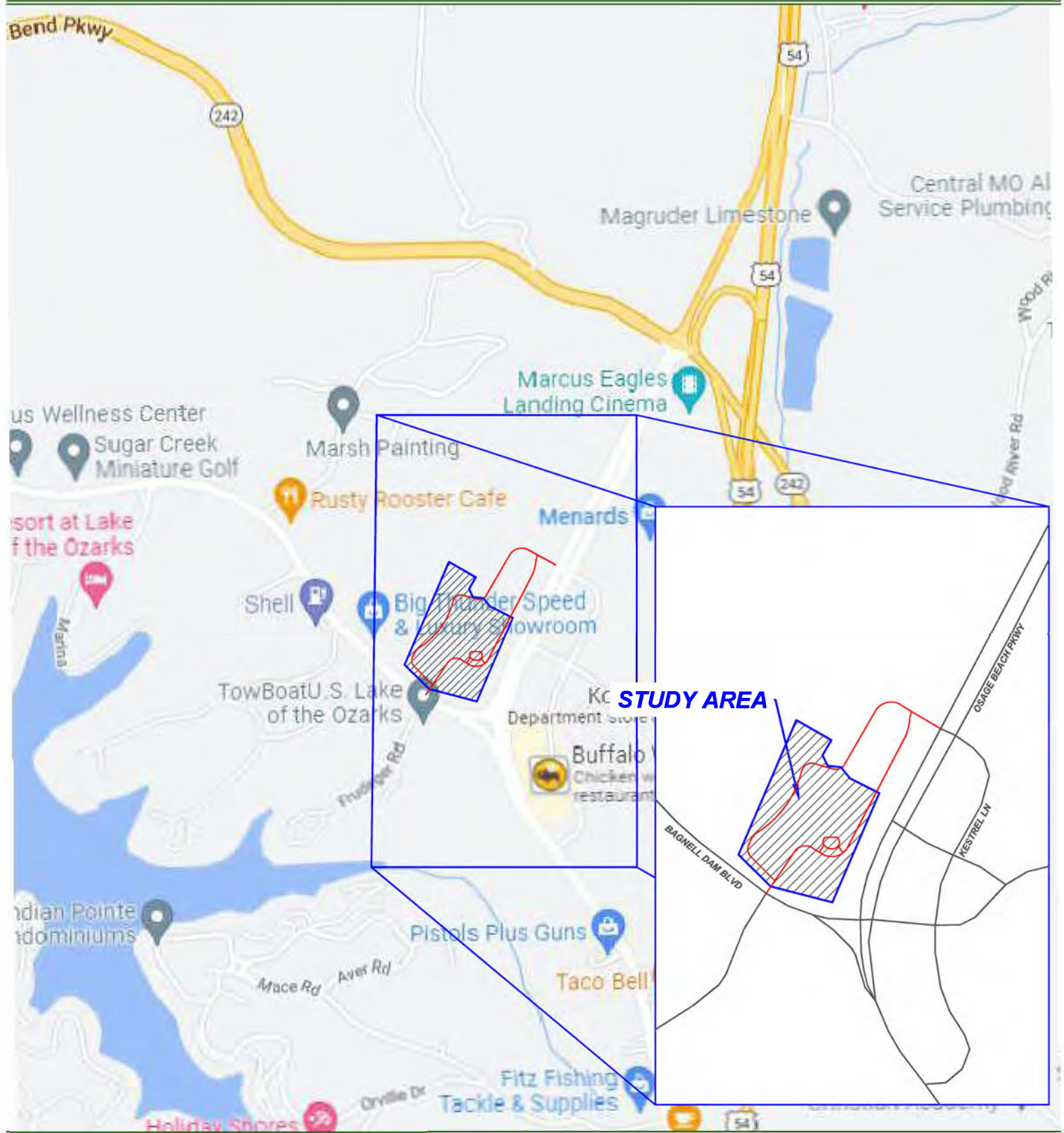
INTRODUCTION

PURPOSE OF STUDY

A commercial development has been proposed for an existing parcel in Osage Beach, Missouri that has Bagnell Dam Boulevard run along its southern border & Osage Beach Parkway run along its eastern border. **Exhibit 1** illustrates the location of the proposed development. The study will view two alternatives for the property. Alternative A will feature a 750 slot machine full service casino while Alternative B will feature a 100 room hotel with various amenities. The purpose of this study is to determine the potential impact to the transportation network due to potential development and identify any necessary improvements (lane additions and/or traffic control modifications) to the adjacent and nearby road system to mitigate the impact and maintain a satisfactory level of service, adequate safety, and access for the proposed development.

STUDY OBJECTIVES

The objective of this study is to evaluate development access points and traffic impacts on the public roadway network adjacent to the site of the proposed development. This report will identify possible traffic related concerns that could arise due to the proposed development and recommend any needed improvements based on comprehensive data attained in the field and traffic projections.



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AREA CONDITIONS

TRANSPORTATION NETWORK STUDY AREA

AREA ROADWAY SYSTEM EXISTING

Exhibit 2 illustrates the existing roadway system with Friday & Sunday Peak peak hour traffic volumes for the adjacent roadways. The roadways analyzed within the study have the following characteristics:

BAGNELL DAM BOULEVARD (South of the development) Bagnell Dam Boulevard is an east/west roadway. The roadway provides full access to residential and commercial properties in Osage Beach, Missouri. It is a three-lane roadway that becomes a four-lane roadway as it nears the signal with typical lane widths of 12 feet. Traffic volumes at Bagnell Dam Boulevard recorded 14,610 vehicles per day, 1,315 vehicles in the Friday peak hour, and 1,163 vehicles in the Sunday peak hour. Bagnell Dam Boulevard is classified as a Major Collector by the Missouri Department of Transportation Functional Classification System for Miller County. The roadway is under the jurisdiction of the City of Osage Beach and is posted with a 40 MPH speed limit near the development.

OSAGE BEACH PARKWAY (East of the development) Grand Street is a north/south roadway. The roadway provides full access to commercial properties in Osage Beach, Missouri. It is a five-lane roadway with typical lane widths of 12 feet. Traffic volumes at Osage Beach Parkway recorded 20,770 vehicles per day, 1,869 vehicles in the Friday peak hour, and 1,834 vehicles in the Sunday peak hour. Osage Beach Parkway is classified as a Major Collector by the MoDOT Rural Functional Classification System for Miller County. The roadway is under the jurisdiction of the City of Osage Beach and is posted with a 45 MPH speed limit near the development.

HORSESHOE BEND PARKWAY (North of the development) Horseshoe Bend Parkway is an east/west roadway. The roadway provides full access to commercial properties in Springfield, Missouri. It is a four-lane roadway with typical lane widths of 12 feet. Traffic volumes at Horseshoe Bend Parkway recorded 10,120 vehicles per day, 911 vehicles in the Friday peak hour, and 861 vehicles in the Sunday peak hour. Horseshoe Bend Parkway is classified as a Minor Arterial by the MoDOT Rural Functional Classification System for Miller County. The roadway is under the jurisdiction of MoDOT and is posted with a 45 MPH speed limit near the development.

MO-54 RAMP (North of the development) MO-54 is a southbound ramp that runs off of MO-54 and connects into Osage Beach Parkway. It is a one-lane roadway with a lane width of 13 feet. Traffic volumes at MO-54 Ramp recorded 4,840 vehicles per day, 436 vehicles in the Friday peak hour, and 355 vehicles in the Sunday peak hour. MO-54 Ramp is classified as an Other Freeway and Expressway by the MoDOT Rural Functional Classification System for Miller County. The roadway is under the jurisdiction of MoDOT and while unposted, is assumed to have a 35 MPH speed limit near the development.

AREA ROADWAY SYSTEM FUTURE

ACCESS P1 Access P1 will provide access to the subject property from Bagnell Dam Boulevard and will provide full ingress/egress to all development traffic.

ACCESS P2 Access P2 will provide full access onto Osage Beach Parkway to the subject property and will provide full ingress/egress to all development traffic.

Exhibit 2 illustrates the existing roadway system and the existing Friday & Sunday peak hour traffic volumes for the adjacent roadways.

Traffic is typically analyzed in the peak hour condition, which allows an analysis of -
case scenario due to the nature of traffic in the study area and projected land uses, a Friday & Sunday peak hour was determined to be the most applicable period for analysis.

EXHIBIT 2

EXISTING TRAFFIC VOLUME FRIDAY & SUNDAY PEAK HOUR



LEGEND	
	FRIDAY PEAK (SUNDAY PEAK)
	TURNING MOVEMENT
	SIGNAL STOP CONTROL
	STOP SIGN CONTROL



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Existing Traffic

EXISTING CAPACITY

Due to the type of development proposed at this property, a capacity analysis of the existing road system was conducted to analyze intersection operations during the Friday & Sunday peak hour.

EXISTING LEVEL OF SERVICE

The capacity was analyzed using Synchro Traffic modeling software, which is based on procedures and techniques outlined in the *HIGHWAY CAPACITY MANUAL*, 2010 Edition which is published by the Transportation Research Board to determine operational level of service (LOS) and lane requirements. The quality of traffic flow is estimated based on calculations of delay to vehicles on each approach at an intersection. A grading system has been developed in the *Highway Capacity Manual* related to delay per vehicle which defines the quality of flow from Level A for free flowing conditions through Level F representing extreme congestion with excessive delays. Levels of traffic service are quantifiable measures of traffic flow that are represented by such factors as speed and delay time, traffic interruptions, safety, driving comfort and convenience. Level of service (LOS), vehicular delay and volume-to-capacity are key measures of effectiveness (MOEs) in the analysis of intersections.

The thresholds that define LOS are based on the type of traffic control used at an intersection; i.e., whether it is signalized or unsignalized. For signalized intersections, the average control delay per vehicle is estimated for each movement and aggregated for each approach and the intersection as a whole. At intersections with partial (side-street) stop control, the delay for each minor movement and approach is determined with no report for the intersection as a whole (since motorists on the main road are not required to stop and are assumed to operate under free-flow conditions). LOS is directly related to control delay. Highway designers strive

LOS E is acceptable during the peak hour. **Table 1** shows the LOS for the existing traffic volumes and lane geometrics for the Friday & Sunday peak hour.

Table 1: Existing Peak Hour Measures of Effectiveness
Summary of Intersection Capacity Analysis & Geometric Configuration

Osage Beach Pkwy & Bagnell Dam Blvd		Signal	24.6	C	23.8	C
Eastbound Left	1		48.9	D	48.0	D
Eastbound Through	1		37.8	D	37.1	D
Eastbound Right	1		13.9	B	15.1	B
Westbound Left	1		49.2	D	48.4	D
Westbound Through	1		40.4	D	36.7	D
Westbound Right	1		1.2	A	0.9	A
Northbound Left	2		40.4	D	39.4	D
Northbound Through	2		11.6	B	9.2	A
Northbound Right	1		1.7	A	2.0	A
Southbound Left	1		49.6	D	48.1	D
Southbound Through / Right	2		22.6	C	23.2	C
Osage Beach Pkwy & Kestrel Lane		OWSC	0.9	A	1.5	A
Westbound Left	1	Stop	17.8	C	17.6	C
Westbound Right	1	Stop	9.8	A	9.6	A
Northbound Through	2	Free	0.0	A	0.0	A
Northbound Right	1	Free	0.0	A	0.0	A
Southbound Left	1	Free	8.5	A	8.3	A
Southbound Through	2	Free	0.0	A	0.0	A
Osage Beach Pkwy & Horseshoe Bend Pkwy		Signal	23.9	C	23.8	C
Eastbound Through	2		36.4	D	33.9	C
Eastbound Right	1		1.9	A	7.3	A
Westbound Left	1		24.7	C	22.2	C
Westbound Through	2		22.2	C	19.8	B
Northbound Left	2		39.0	D	37.9	D
Northbound Right	1		13.6	B	13.5	B
Southbound Left	1		22.0	C	22.0	C
Southbound Through	1		34.7	C	35.4	D
Southbound Right	1		3.2	A	0.5	A

2025 Projected Traffic Alternative A

SITE TRAFFIC

2025 PROPOSED TRIP GENERATION

Traffic generated to and from the development was estimated based upon data provided in 10th an informative report published by the Institute of Transportation Engineers (2017). The ITE Trip Generation Report is recognized by land use and traffic planners as the most authoritative text available for estimating the trip generation of various types of land development. Traffic volumes for future development are estimated in ter A Trip End is defined as a one-way trip to or from the subject property that has the property as either its origin or destination. In determining trip generation, the average rate as given by the ITE Trip Generation Report was used. Average daily

trip generations have been calculated for the proposed development. For the purpose of this study, the criterion above was used to compute the trips generated. The number of trips was subsequently used to determine the impact on adjacent roadways.

Table 2 summarizes the average daily, Friday, and Sunday peak hour traffic generated to and from the property for the proposed development, based on the expectations previously stated.

Table 2: Alternative A - Average Daily, Friday, & Sunday Trip Generation

Casino	--	750	Slot Machines	7,448	235	208	254	226
TOTAL NEW TRIPS				7,448	235	208	254	226

¹ Given the lack of data provided by ITE for a full service casino, trip generation rates were obtained from a generation rate has the other planned uses of the casino built into the numbers provided.

Full Trip Generation Table including the Friday & Sunday Peak Hour Rate and Percent Entering / Percent Exiting can be viewed in the **Appendix II**.

2025 PROPOSED TRIP DISTRIBUTION

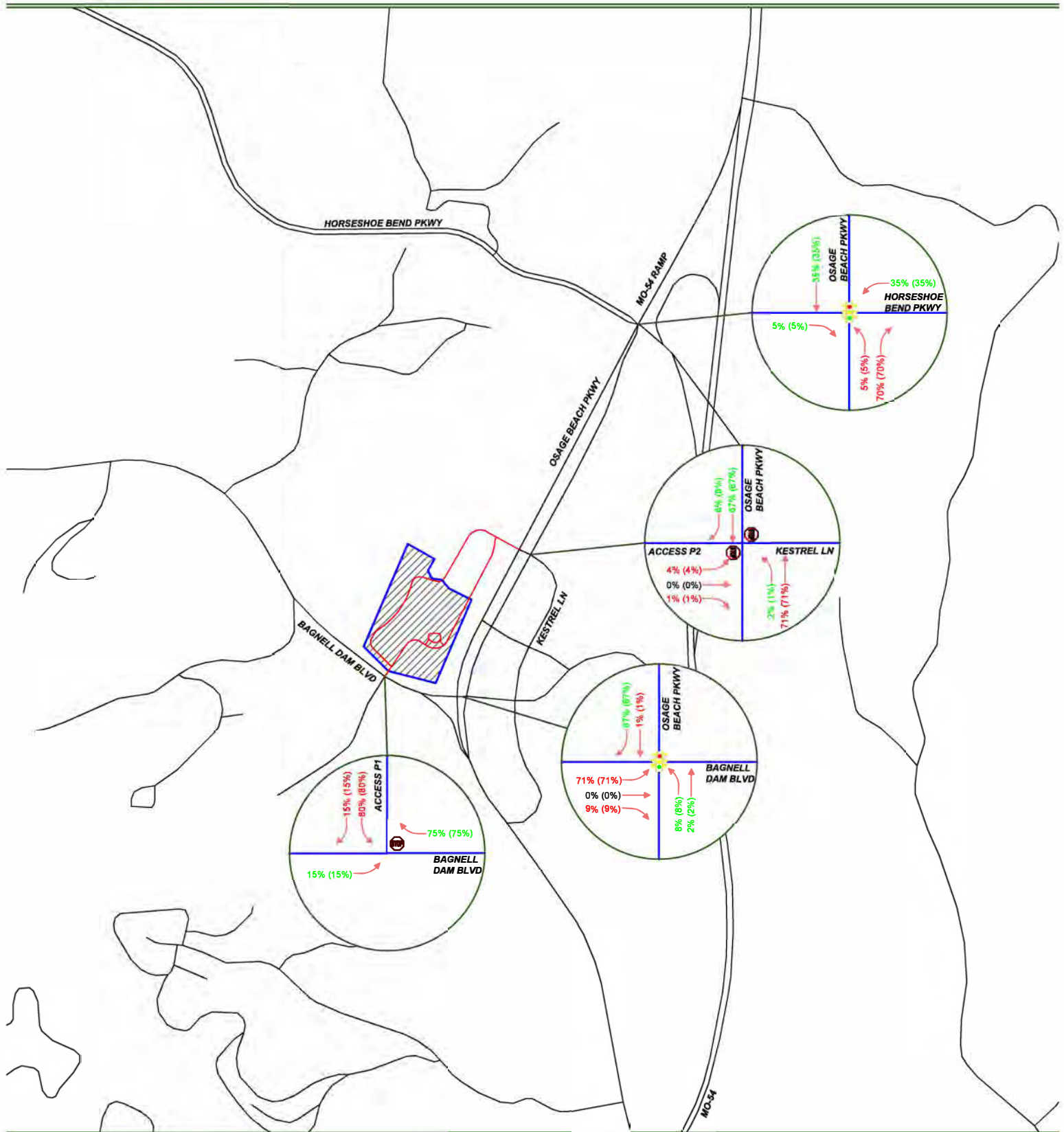
For the purpose of this study a directional distribution of traffic was compiled in order to accurately describe the traffic patterns the development is projected to create. The directional distribution is used to distribute the traffic generated by the proposed development onto the roadway network.

Table 3 summarizes the expected 2025 Friday & Sunday new trip directional distribution of traffic to and from the site as used in the study.

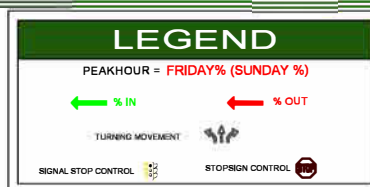
Table 3: Alternative A - 2025 New Trip Directional Distribution

Access P1			90% / 95%	90% / 95%
Access P2			10% / 5%	10% / 5%
Bagnell Dam Blvd	West of	Access P1	15% / 15%	15% / 15%
Bagnell Dam Blvd	Access P1	Osage Beach Pkwy	75% / 80%	75% / 80%
Bagnell Dam Blvd	East of	Osage Beach Pkwy	0% / 0%	0% / 0%
Osage Beach Pkwy	South of	Bagnell Dam Blvd	10% / 10%	10% / 10%
Osage Beach Pkwy	Bagnell Dam Blvd	Access P2	69% / 72%	69% / 72%
Osage Beach Pkwy	Access P2	Horseshoe Bend Pkwy	75% / 75%	75% / 75%
MO-54 Ramp	North of	Horseshoe Bend Pkwy	35% / 0%	35% / 0%
Horseshoe Bend Pkwy	West of	Osage Beach Pkwy	5% / 5%	5% / 5%
Horseshoe Bend Pkwy	East of	Osage Beach Pkwy	35% / 70%	35% / 70%

Exhibit 3 illustrates the new trip directional distribution of traffic entering and exiting the study area for the Friday & Sunday peak hour as shown in **Table 3**.



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SCALE: NTS



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ALTERNATIVE A - 2025 TOTAL FUTURE TRAFFIC

2025 BUILD CONDITION (TOTAL TRAFFIC CONDITIONS)

Using the existing traffic grown annually at 2% for 2 years, the estimated generated trip ends from **Table 2** and the assumed directional distribution of traffic from **Table 3**, it is possible to estimate the traffic on each of the impacted roads. **Tables 4 & 5** represent the two-way traffic anticipated at full build out during the day, Friday, and Sunday Peak Hour respectively onto each roadway segment.

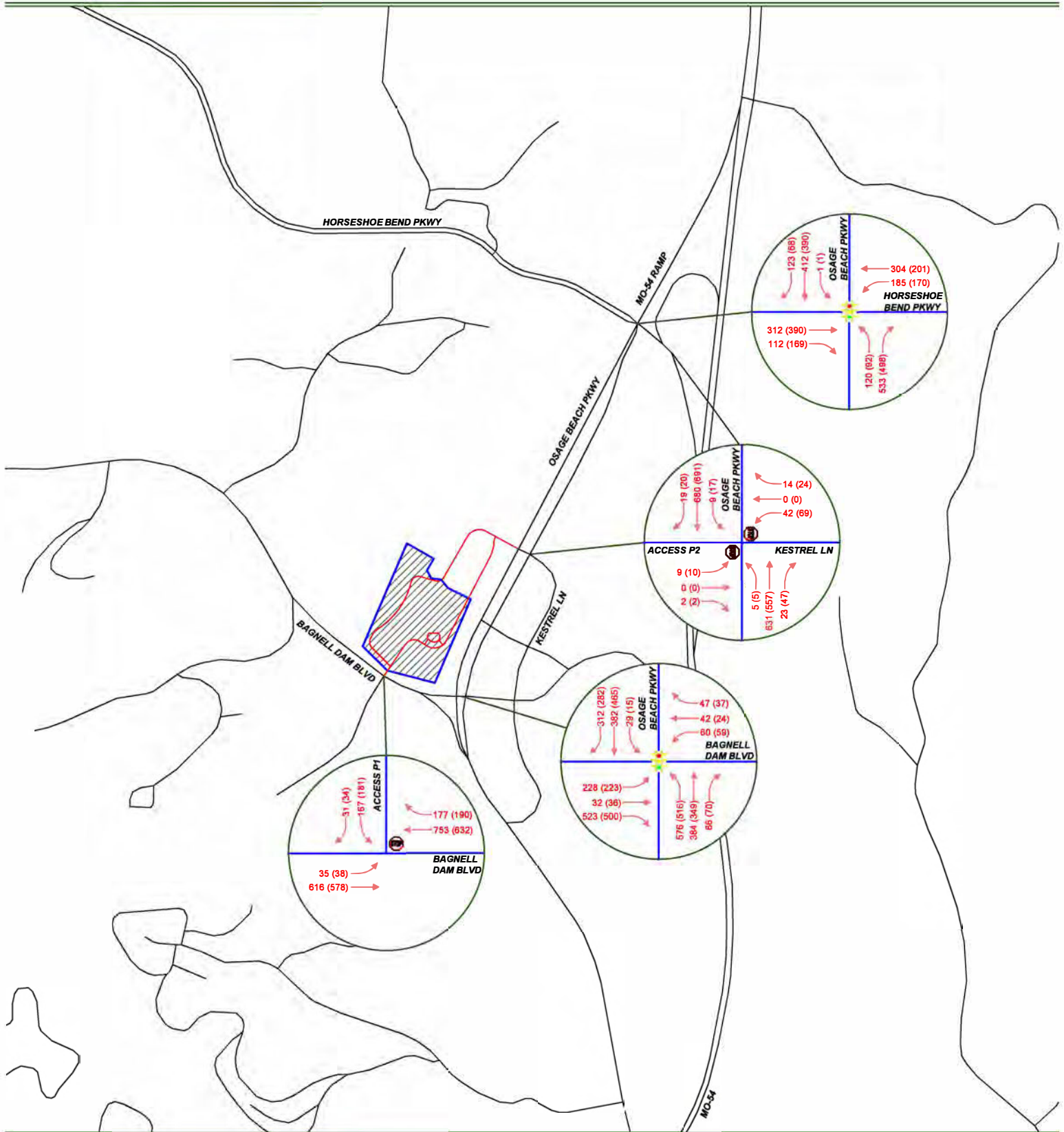
Table 4: Alternative A - 2025 Friday Peak Hour Projected Traffic Volumes

Access P1			--	410
Access P2			--	35
Bagnell Dam Blvd	West of	Access P1	1,315	1,435
Bagnell Dam Blvd	Access P1	Osage Beach Pkwy	1,315	1,713
Bagnell Dam Blvd	East of	Osage Beach Pkwy	265	276
Osage Beach Pkwy	South of	Bagnell Dam Blvd	1,869	1,992
Osage Beach Pkwy	Bagnell Dam Blvd	Access P2	1,029	1,383
Osage Beach Pkwy	Access P2	Horseshoe Bend Pkwy	989	1,362
MO-54 Ramp	North of	Horseshoe Bend Pkwy	436	536
Horseshoe Bend Pkwy	West of	Osage Beach Pkwy	911	971
Horseshoe Bend Pkwy	East of	Osage Beach Pkwy	1,064	1,335

Table 5: Alternative A - 2025 Sunday Peak Hour Projected Traffic Volumes

Access P1			--	443
Access P2			--	37
Bagnell Dam Blvd	West of	Access P1	1,163	1,282
Bagnell Dam Blvd	Access P1	Osage Beach Pkwy	1,163	1,581
Bagnell Dam Blvd	East of	Osage Beach Pkwy	232	241
Osage Beach Pkwy	South of	Bagnell Dam Blvd	1,834	1,959
Osage Beach Pkwy	Bagnell Dam Blvd	Access P2	993	1,371
Osage Beach Pkwy	Access P2	Horseshoe Bend Pkwy	921	1,319
MO-54 Ramp	North of	Horseshoe Bend Pkwy	355	459
Horseshoe Bend Pkwy	West of	Osage Beach Pkwy	861	920
Horseshoe Bend Pkwy	East of	Osage Beach Pkwy	973	1,260

EXHIBIT 4 ALTERNATIVE A TRAFFIC ASSIGNMENT FRIDAY AND SUNDAY PEAK HOUR



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Alternative A - 2025 Traffic Analysis

SITE ACCESS

Access to the development is being proposed through two access points. Access P1 will be located off of Bagnell Dam Boulevard. Access P2 will be located off of Osage Beach Parkway. Roadway access point capacity must be analyzed thoroughly in order to ensure that the roadway network adequately handles future traffic demands based on the additional development trip generation.

CAPACITY AND INTERSECTION UTILIZATION AT STUDY ROADWAYS AND INTERSECTIONS

PROPOSED 2025 PEAK HOUR LEVEL OF SERVICE (NO BUILD)

A capacity analysis of the road system was conducted assuming no improvements would be made in order to analyze intersection operations during the Friday & Sunday peak hours and determines the condition of the future roadway infrastructure with a no-build option. The capacity was analyzed using Synchro Traffic modeling software, which is based on procedures and techniques outlined in the HIGHWAY CAPACITY MANUAL, 2010 Edition which is published by the Transportation Research Board to determine operational level of service (LOS) and lane requirements.

Table 6 illustrates the Friday & Sunday peak hour level of service for the intersection based upon the construction of the development and no roadway improvements.

Table 6: Alternative A - 2025 Peak Measures of Effectiveness (No Roadway Improvements)
Summary of Intersection Capacity Analysis & Geometric Configuration

Access P1 & Bagnell Dam Blvd		OWSC	4.7	A	4.8	A
Eastbound Left	1	Free	10.6	B	10.0	B
Eastbound Through	1	Free	0.0	A	0.0	B
Westbound Through / Right	1	Free	0.0	A	0.0	A
Southbound Left / Right	1	Stop	40.5	E	35.1	E
Osage Beach Pkwy & Bagnell Dam Blvd		Signal	29.8	C	30.0	C
Eastbound Left	1		56.2	E	55.2	E
Eastbound Through	1		34.9	C	34.3	C
Eastbound Right	1		14.4	B	17.4	B
Westbound Left	1		61.5	E	63.1	E
Westbound Through	1		50.7	D	48.0	D
Westbound Right	1		1.2	A	1.0	A
Northbound Left	2		47.3	D	47.1	D
Northbound Through	2		14.7	B	12.7	B
Northbound Right	1		0.2	A	0.2	A
Southbound Left	1		57.8	E	55.4	E
Southbound Through / Right	2		25.9	C	27.7	C

Osage Beach Pkwy & Access P2 / Kestrel Lane		OWSC	1.3	A	2.3	A
Eastbound Left / Through / Right	1	Stop	25.4	D	26.8	D
Westbound Left / Through	1	Stop	26.6	D	29.7	D
Westbound Right	1	Stop	26.6	D	29.7	D
Northbound Left / Through	2	Free	0.1	A	0.1	A
Northbound Right	1	Free	0.0	A	0.0	A
Southbound Left	1	Free	9.0	A	8.9	A
Southbound Through / Right	2	Free	0.0	A	0.0	A
Osage Beach Pkwy & Horseshoe Bend Pkwy		Signal	28.4	C	28.9	C
Eastbound Through	2		44.3	D	43.1	D
Eastbound Right	1		4.2	A	9.1	A
Westbound Left	1		34.8	C	32.3	C
Westbound Through	2		25.2	C	22.9	C
Northbound Left	2		41.9	D	42.5	D
Northbound Right	1		14.7	B	15.2	B
Southbound Left	1		24.0	C	25.0	C
Southbound Through	1		43.8	D	44.5	D
Southbound Right	1		3.7	A	0.5	A

Table 7: Alternative A - Intersection Improvements: Turn Lane Warrants¹

Access P1 & Bagnell Dam Blvd	Westbound	Right	Yes	90	100
Osage Beach Parkway & Access P2²	Northbound	Left	No	--	--
Osage Beach Parkway & Access P2	Southbound	Right	No	--	--
Osage Beach Parkway & Access P2	Eastbound	Left	No	--	--
Osage Beach Parkway & Access P2²	Eastbound	Right	No	--	--

¹ All turn lane warrants can be viewed as individual charts in **Appendix II**.

² Projected traffic volumes did not meet the minimum requirements necessary to perform a turn lane analysis. Therefore, no charts are shown for these movements in **Appendix II**.

PROPOSED 2025 PEAK HOUR LEVEL OF SERVICE (BUILD)

The analysis of the proposed intersections revealed that the intersection of Access P1 & Bagnell Dam Boulevard will require a designated westbound right turn lane.

**Table 8: Alternative A - 2025 Peak Measures of Effectiveness (w/ Roadway Improvements)
Summary of Intersection Capacity Analysis & Geometric Configuration**

Access P1 & Bagnell Dam Blvd		OWSC	4.0	A	4.1	A
Eastbound Left	1	Free	10.6	B	10.0	B
Eastbound Through	1	Free	0.0	A	0.0	A
Westbound Through	1	Free	0.0	A	0.0	A
Westbound Right	1	Free	0.0	A	0.0	A
Southbound Left / Right	1	Stop	34.3	D	29.9	D

Osage Beach Pkwy & Bagnell Dam Blvd		Signal	29.8	C	30.0	C
Eastbound Left	1		56.2	E	55.2	E
Eastbound Through	1		34.9	C	34.3	C
Eastbound Right	1		14.4	B	17.4	B
Westbound Left	1		61.5	E	63.1	E
Westbound Through	1		50.7	D	48.0	D
Westbound Right	1		1.2	A	1.0	A
Northbound Left	2		47.3	D	47.1	D
Northbound Through	2		14.7	B	12.7	B
Northbound Right	1		0.2	A	0.2	A
Southbound Left	1		57.8	E	55.4	E
Southbound Through / Right	2		25.9	C	27.7	C
Osage Beach Pkwy & Access P2 / Kestrel Lane		OWSC	1.3	A	2.3	A
Eastbound Left / Through / Right	1	Stop	25.4	D	26.8	D
Westbound Left / Through	1	Stop	26.6	D	29.7	D
Westbound Right	1	Stop	26.6	D	29.7	D
Northbound Left / Through	2	Free	0.0	A	0.1	A
Northbound Right	1	Free	0.0	A	0.0	A
Southbound Left	1	Free	9.0	A	8.9	A
Southbound Through / Right	2	Free	0.0	A	0.0	A
Osage Beach Pkwy & Horseshoe Bend Pkwy		Signal	28.4	C	28.9	C
Eastbound Through	2		44.3	D	43.1	D
Eastbound Right	1		4.2	A	9.1	A
Westbound Left	1		34.8	C	32.3	C
Westbound Through	2		25.2	C	22.9	C
Northbound Left	2		41.9	D	42.5	D
Northbound Right	1		14.7	B	15.2	B
Southbound Left	1		24.0	C	25.0	C
Southbound Through	1		43.8	D	44.5	D
Southbound Right	1		3.7	A	0.5	A

Alternative A - Findings & Recommendations

Sight Distance at the Proposed Entrances Careful consideration should be given to sight distance obstructions when planning any future development or aesthetic enhancements, such as berms, fencing, or landscaping, to ensure that these improvements do not obstruct the view of entering and exiting traffic at the development entrance with public roads. It is generally recommended that all improvements higher than 3.5 feet above the elevation of the nearest pavement edge be held back at least 20 feet from the traveled roadway.

Access P1 Access P1 will serve as a full access driveway, providing full ingress and egress to the development.

Access P2 Access P2 will serve as a full access driveway, providing full ingress and egress to the development.

SUMMARY OF NEEDED IMPROVEMENTS

Roadway Improvements 2025 (Alternative A) The analysis of the proposed intersections revealed that the intersection of Access P1 & Bagnell Dam Boulevard will require a designated westbound right turn lane.

SUMMARY OF INTERSECTION ANALYSIS

The results of the study for Alternative A showed that in 2025, the intersection of Access P1 & Bagnell Dam Boulevard will operate at a level of service A overall. The signalized intersection of Osage Beach Parkway & Bagnell Dam Boulevard will operate at a level of service C overall. The intersection of Osage Beach Parkway & Access P2 / Kestrel Lane will operate at a level of service A overall. The signalized intersection of Osage Beach Parkway & Horseshoe Bend Parkway will operate at a level of service C overall.

2025 Projected Traffic Alternative B

SITE TRAFFIC

2025 PROPOSED TRIP GENERATION

Traffic generated to and from the development was estimated based upon data provided in 10th an informative report published by the Institute of Transportation Engineers (2017). The ITE Trip Generation Report is recognized by land use and traffic planners as the most authoritative text available for estimating the trip generation of various types of land development. Traffic volumes for future development are estimated in A Trip End is defined as a one-way trip to or from the subject property that has the property as either its origin or destination. In determining trip generation, the average rate as given by the ITE Trip Generation Report was used. Average daily trip generations have been calculated for the proposed development. For the purpose of this study, the criterion above was used to compute the trips generated. The number of trips was subsequently used to determine the impact on adjacent roadways.

Table 9 summarizes the average daily, Friday, and Sunday peak hour traffic generated to and from the property for the proposed development, based on the expectations previously stated.

Table 9: Alternative B - Average Daily, Friday, & Sunday Trip Generation

Hotel	310	100	Rooms	799	35	25	27	30
TOTAL NEW TRIPS				799	35	25	27	30

Full Trip Generation Table including the Friday & Sunday Peak Hour Rate and Percent Entering / Percent Exiting can be viewed in the **Appendix III**.

2025 PROPOSED TRIP DISTRIBUTION

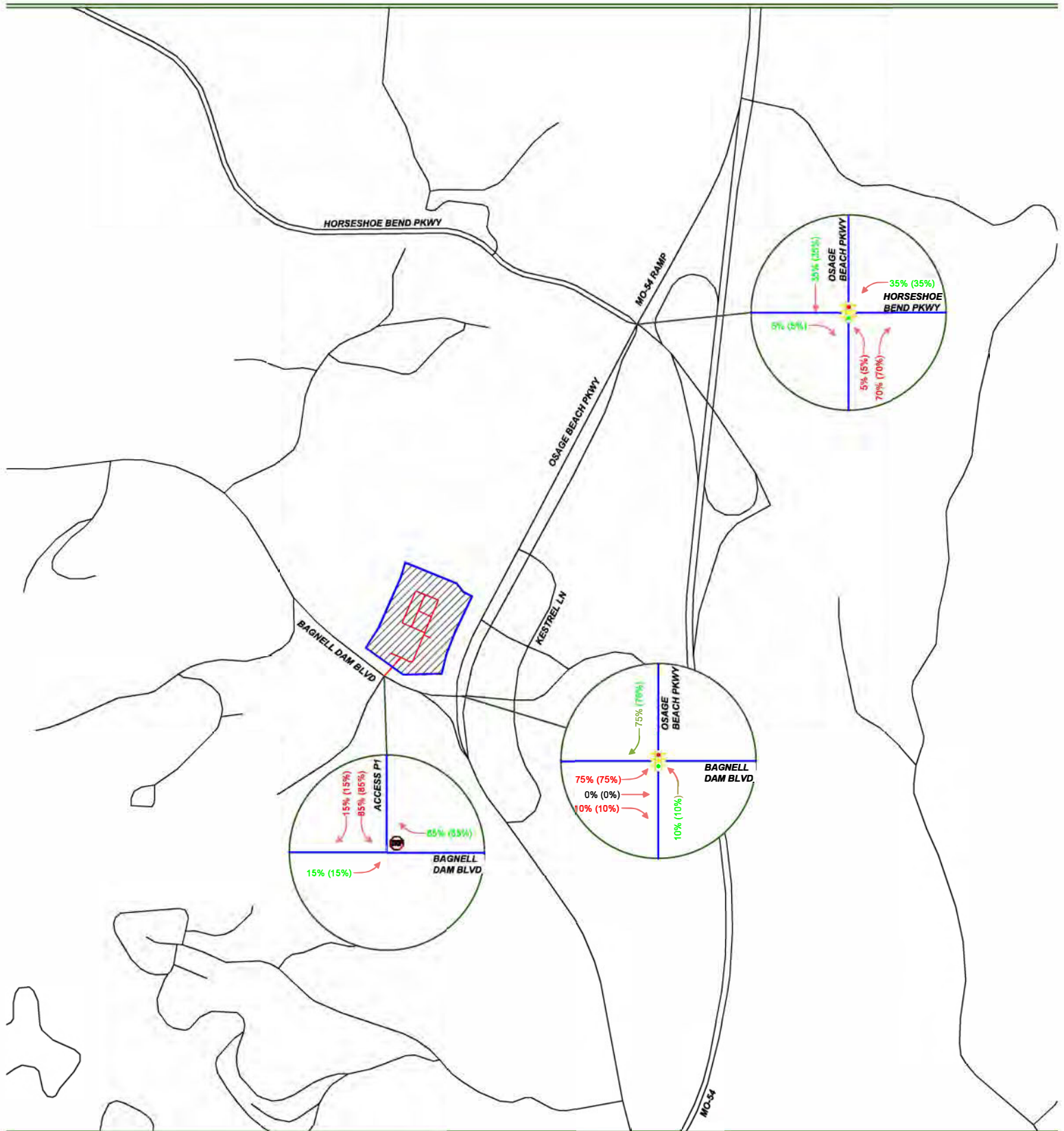
For the purpose of this study a directional distribution of traffic was compiled in order to accurately describe the traffic patterns the development is projected to create. The directional distribution is used to distribute the traffic generated by the proposed development onto the roadway network.

Table 10 summarizes the expected 2025 Friday & Sunday new trip directional distribution of traffic to and from the site as used in the study.

Table 10: Alternative B - 2025 New Trip Directional Distribution

Access P1			100% / 100%	100% / 100%
Bagnell Dam Blvd	West of	Access P1	15% / 15%	15% / 15%
Bagnell Dam Blvd	Access P1	Osage Beach Pkwy	85% / 85%	85% / 85%
Bagnell Dam Blvd	East of	Osage Beach Pkwy	0% / 0%	0% / 0%
Osage Beach Pkwy	South of	Bagnell Dam Blvd	10% / 10%	10% / 10%
Osage Beach Pkwy	Bagnell Dam Blvd	Horseshoe Bend Pkwy	75% / 75%	75% / 75%
MO-54 Ramp	North of	Horseshoe Bend Pkwy	35% / 0%	35% / 0%
Horseshoe Bend Pkwy	West of	Osage Beach Pkwy	5% / 5%	5% / 5%
Horseshoe Bend Pkwy	East of	Osage Beach Pkwy	35% / 70%	35% / 70%

Exhibit 3 illustrates the new trip directional distribution of traffic entering and exiting the study area for the Friday & Sunday peak hour as shown in **Table 3**.



LEGEND

PEAKHOUR = FRIDAY% (SUNDAY %)

← % IN → % OUT

TURNING MOVEMENT

SIGNAL STOP CONTROL

STOP SIGN CONTROL

ALTERNATIVE B - 2025 TOTAL FUTURE TRAFFIC

2025 BUILD CONDITION (TOTAL TRAFFIC CONDITIONS)

Using the existing traffic grown annually at 2% for 2 years, the estimated generated trip ends from **Table 9** and the assumed directional distribution of traffic from **Table 10**, it is possible to estimate the traffic on each of the impacted roads. **Tables 11 & 12** represent the two-way traffic anticipated at full build out during the day, Friday, and Sunday Peak Hour respectively onto each roadway segment.

Table 11: Alternative B - 2025 Friday Peak Hour Projected Traffic Volumes

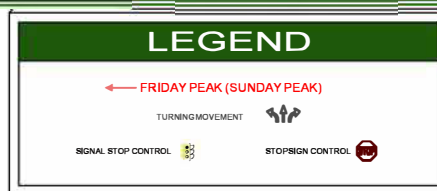
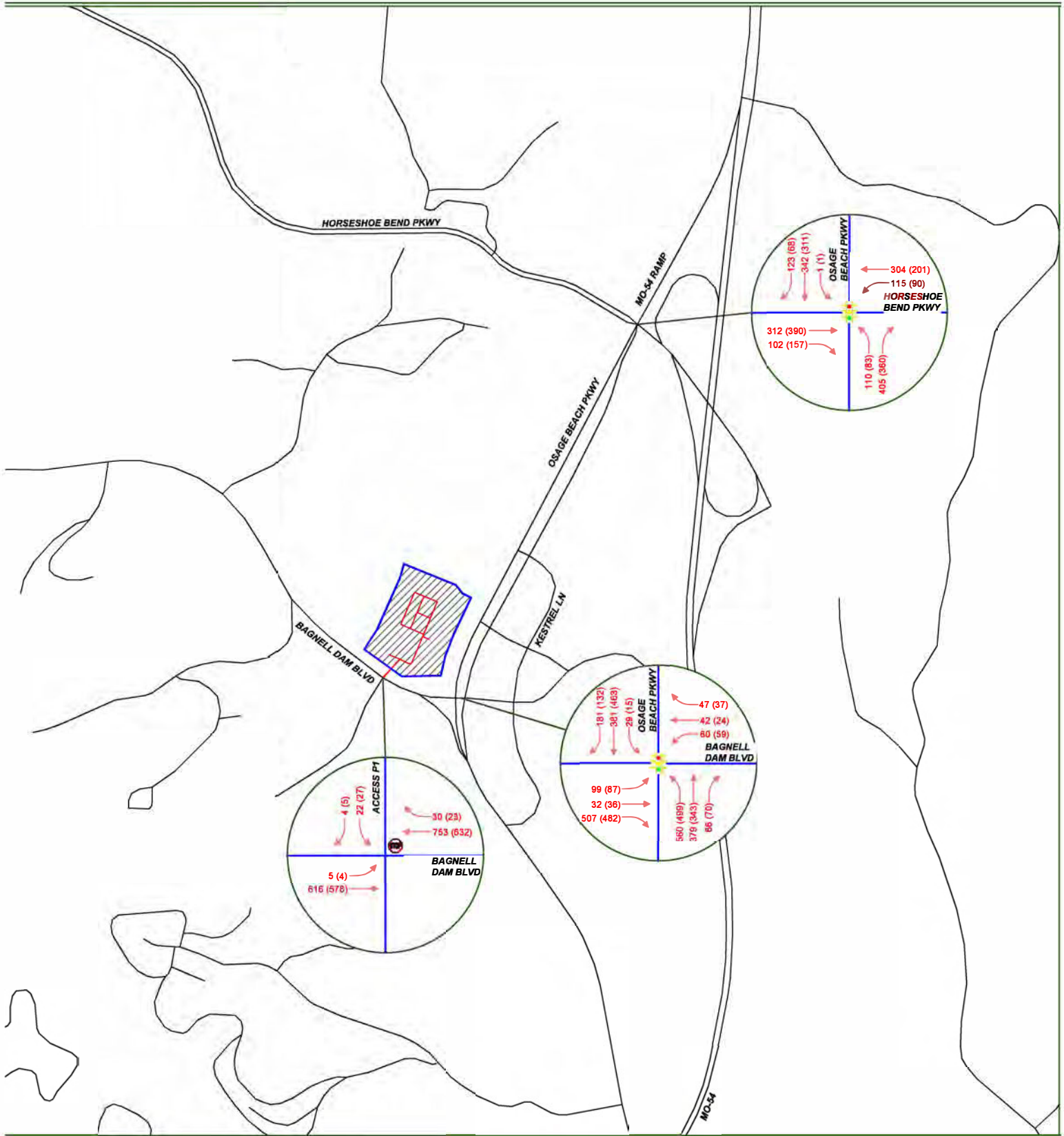
Access P1			--	61
Bagnell Dam Blvd	West of	Access P1	1,315	1,378
Bagnell Dam Blvd	Access P1	Osage Beach Pkwy	1,315	1,421
Bagnell Dam Blvd	East of	Osage Beach Pkwy	265	276
Osage Beach Pkwy	South of	Bagnell Dam Blvd	1,869	1,953
Osage Beach Pkwy	Bagnell Dam Blvd	Horseshoe Bend Pkwy	1,029	1,116
MO-54 Ramp	North of	Horseshoe Bend Pkwy	436	466
Horseshoe Bend Pkwy	West of	Osage Beach Pkwy	911	951
Horseshoe Bend Pkwy	East of	Osage Beach Pkwy	1,064	1,137

Table 12: Alternative B - 2025 Sunday Peak Hour Projected Traffic Volumes

Access P1			--	59
Bagnell Dam Blvd	West of	Access P1	1,163	1,219
Bagnell Dam Blvd	Access P1	Osage Beach Pkwy	1,163	1,260
Bagnell Dam Blvd	East of	Osage Beach Pkwy	232	241
Osage Beach Pkwy	South of	Bagnell Dam Blvd	1,834	1,916
Osage Beach Pkwy	Bagnell Dam Blvd	Horseshoe Bend Pkwy	993	1,077
MO-54 Ramp	North of	Horseshoe Bend Pkwy	355	380
Horseshoe Bend Pkwy	West of	Osage Beach Pkwy	861	899
Horseshoe Bend Pkwy	East of	Osage Beach Pkwy	973	1,042

EXHIBIT 6

ALTERNATIVE B TRAFFIC ASSIGNMENT FRIDAY AND SUNDAY PEAK HOUR



www.GoCJW.com

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CJW PROJECT No. 22085

Alternative B - 2025 Traffic Analysis

SITE ACCESS

Access to the development is being proposed through one access point. Access P1 will be located off of Bagnell Dam Boulevard. Roadway access point capacity must be analyzed thoroughly in order to ensure that the roadway network adequately handles future traffic demands based on the additional development trip generation.

CAPACITY AND INTERSECTION UTILIZATION AT STUDY ROADWAYS AND INTERSECTIONS

PROPOSED 2025 PEAK HOUR LEVEL OF SERVICE (NO BUILD)

A capacity analysis of the road system was conducted assuming no improvements would be made in order to analyze intersection operations during the Friday & Sunday peak hours and determines the condition of the future roadway infrastructure with a no-build option. The capacity was analyzed using Synchro Traffic modeling software, which is based on procedures and techniques outlined in the HIGHWAY CAPACITY MANUAL, 2010 Edition which is published by the Transportation Research Board to determine operational level of service (LOS) and lane requirements.

Table 13 illustrates the Friday & Sunday peak hour level of service for the intersection based upon the construction of the development and no roadway improvements.

Table 13: Alternative B - 2025 Peak Measures of Effectiveness (No Roadway Improvements)
Summary of Intersection Capacity Analysis & Geometric Configuration

Access P1 & Bagnell Dam Blvd		OWSC	0.3	A	0.4	A
Eastbound Left	1	Free	9.6	A	9.1	A
Eastbound Through	1	Free	0.0	A	0.0	A
Westbound Through / Right	1	Free	0.0	A	0.0	A
Southbound Left / Right	1	Stop	16.4	C	15.0	C
Osage Beach Pkwy & Bagnell Dam Blvd		Signal	26.1	C	26.0	C
Eastbound Left	1		50.3	D	50.2	D
Eastbound Through	1		37.1	D	36.3	D
Eastbound Right	1		15.6	B	17.7	B
Westbound Left	1		52.0	D	51.2	D
Westbound Through	1		42.0	D	38.1	D
Westbound Right	1		1.0	A	0.9	A
Northbound Left	2		41.9	D	41.6	D
Northbound Through	2		12.3	B	11.1	B
Northbound Right	1		0.1	A	2.4	A
Southbound Left	1		51.7	D	50.5	D
Southbound Through / Right	2		24.1	C	24.9	C

Osage Beach Pkwy & Horseshoe Bend Pkwy		Signal	25.2	C	24.8	C
Eastbound Through	2		39.1	D	35.5	D
Eastbound Right	1		2.9	A	8.2	A
Westbound Left	1		26.1	C	23.5	C
Westbound Through	2		22.6	C	20.5	C
Northbound Left	2		39.4	D	39.6	D
Northbound Right	1		14.1	B	13.9	B
Southbound Left	1		22.0	C	23.0	C
Southbound Through	1		37.7	D	36.8	D
Southbound Right	1		3.7	A	0.5	A

Table 14: Alternative B - Intersection Improvements: Turn Lane Warrants¹

Access P1 & Bagnell Dam Blvd	Westbound	Right	No	--	--
---	-----------	-------	----	----	----

¹ All turn lane warrants can be viewed as individual charts in **Appendix II**.

PROPOSED 2025 PEAK HOUR LEVEL OF SERVICE (BUILD)

The analysis of the proposed intersections revealed that no improvements to the roadway were necessary and that the intersections can adequately accommodate the additional traffic.

Alternative B - Findings & Recommendations

Sight Distance at the Proposed Entrances Careful consideration should be given to sight distance obstructions when planning any future development or aesthetic enhancements, such as berms, fencing, or landscaping, to ensure that these improvements do not obstruct the view of entering and exiting traffic at the development entrance with public roads. It is generally recommended that all improvements higher than 3.5 feet above the elevation of the nearest pavement edge be held back at least 20 feet from the traveled roadway.

Access P1 Access P1 will serve as a full access driveway, providing full ingress and egress to the development.

SUMMARY OF NEEDED IMPROVEMENTS

Roadway Improvements 2025 (Alternative B) The analysis of the proposed intersections revealed that no improvements were necessary and that the intersections can adequately accommodate the additional traffic.

SUMMARY OF INTERSECTION ANALYSIS

The results of the study for Alternative B showed that in 2025, the intersection of Access P1 & Bagnell Dam Boulevard will operate at a level of service A overall. The signalized intersection of

Osage Beach Parkway & Bagnell Dam Boulevard will operate at a level of service C overall. The signalized intersection of Osage Beach Parkway & Horseshoe Bend Parkway will operate at a level of service C overall.

We trust this traffic study satisfactorily answers questions concerning the traffic impact on the proposed development. If you need additional information, please contact me.

Respectfully submitted,

CJW TRANSPORTATION CONSULTANTS, LLC

Dane Seiler, P.E., PTOE
CJW Transportation Consultants, LLC.

Justin Orf, P.E.
CJW Transportation Consultants, LLC.

APPENDIX I EXISTING TRAFFIC

PREPARED BY:

Intersection: Osage Beach Parkway & Bagnell Dam Boulevard

N/S Street: Osage Beach Parkway

E/W Street: Bagnell Dam Boulevard

Friday Count

Observer: JO & TD

Date: 7/15/2022

Time	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
4:00-4:15	27	4	84	11	8	8	137	67	11	8	50	28
4:15-4:30	20	8	130	11	9	4	127	79	16	3	78	30
4:30-4:45	16	2	120	16	7	5	148	87	19	5	62	21
4:45-5:00	15	15	118	13	11	6	112	67	19	7	59	27
5:00-5:15	14	6	116	18	13	10	147	76	9	4	44	21
5:15-5:30	11	3	102	9	10	7	131	54	16	2	47	32
5:30-5:45	8	9	120	13	12	11	75	73	10	3	95	19
5:45-6:00	13	9	100	7	7	4	128	78	11	3	59	21
Peak Hour	65	31	484	58	40	25	534	309	63	19	243	99
PHF	0.81	0.52	0.93	0.81	0.77	0.63	0.90	0.89	0.83	0.68	0.78	0.83

Intersection: Osage Beach Parkway & Bagnell Dam Boulevard

N/S Street: Osage Beach Parkway

E/W Street: Bagnell Dam Boulevard

Sunday Count

Observer: JO & TD

Date: 7/17/2022

Time	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
12:15-12:30	16	5	130	19	7	6	108	67	23	5	93	17
12:30-12:45	14	9	120	14	8	10	107	57	12	2	80	14
12:45-1:00	16	9	123	23	7	15	82	66	21	4	79	15
1:00-1:15	15	11	120	10	3	13	97	70	10	4	80	24
1:15-1:30	19	6	109	14	8	12	123	89	17	0	56	11
1:30-1:45	9	8	125	20	9	4	113	70	19	2	77	19
1:45-2:00	14	10	106	13	3	4	143	77	21	3	72	15
2:00-2:15	11	15	115	12	21	3	107	72	16	2	70	12
Peak Hour	57	35	460	57	23	33	476	306	67	9	285	69
PHF	0.75	0.80	0.92	0.71	0.64	0.63	0.83	0.86	0.80	0.56	0.89	0.72

Intersection: Osage Beach Parkway & Kestrel Lane

N/S Street: Osage Beach Parkway

E/W Street: Kestrel Lane

Friday Count

Observer: SP

Date: 7/15/2022

Time	WB		NB	SB
	L	R	R	L
4:00-4:15	8	4	8	3
4:15-4:30	8	2	4	2
4:30-4:45	9	2	9	3
4:45-5:00	15	5	1	1
5:00-5:15	10	1	2	2
5:15-5:30	5	5	2	3
5:30-5:45	4	2	5	0
5:45-6:00	10	1	5	2
Peak Hour	40	13	22	9
PHF	0.67	0.65	0.61	0.75

Intersection: Osage Beach Parkway & Kestrel Lane

N/S Street: Osage Beach Parkway

E/W Street: Kestrel Lane

Sunday Count

Observer: SP

Date: 7/17/2022

Time	WB		NB	SB
	L	R	R	L
12:15-12:30	11	6	13	3
12:30-12:45	10	8	3	3
12:45-1:00	9	3	12	2
1:00-1:15	20	8	14	4
1:15-1:30	14	4	11	2
1:30-1:45	19	7	8	7
1:45-2:00	13	4	12	3
2:00-2:15	13	10	8	2
Peak Hour	66	23	45	16
PHF	0.83	0.72	0.80	0.57

Intersection: Osage Beach Parkway & Horseshoe Bend Parkway

N/S Street: Osage Beach Parkway

E/W Street: Horseshoe Bend Parkway

Friday Count

Observer: CG & JP

Date: 7/15/2022

Time	EB		WB		NB		SB		
	T	R	L	T	L	R	L	T	R
4:00-4:15	76	26	21	57	20	90	0	88	49
4:15-4:30	86	27	29	82	27	89	1	66	44
4:30-4:45	75	24	23	76	27	96	0	87	42
4:45-5:00	63	19	26	77	31	97	0	76	46
5:00-5:15	74	22	19	80	26	101	0	52	48
5:15-5:30	79	16	16	77	25	102	0	70	44
5:30-5:45	73	17	20	81	30	76	0	76	54
5:45-6:00	72	11	24	75	21	87	0	58	61
Peak Hour	300	96	99	292	105	372	1	317	181
PHF	0.87	0.89	0.85	0.89	0.85	0.96	0.25	0.90	0.92

Intersection: Osage Beach Parkway & Horseshoe Bend Parkway

N/S Street: Osage Beach Parkway

E/W Street: Horseshoe Bend Parkway

Sunday Count

Observer: MG & TB

Date: 7/17/2022

Time	EB		WB		NB		SB		
	T	R	L	T	L	R	L	T	R
12:15-12:30	103	34	24	42	23	75	0	87	17
12:30-12:45	99	36	22	50	13	107	0	63	24
12:45-1:00	86	44	12	51	20	50	0	62	13
1:00-1:15	87	36	20	50	22	94	1	77	11
1:15-1:30	81	24	10	62	19	114	0	60	17
1:30-1:45	104	35	18	42	23	71	0	57	18
1:45-2:00	63	23	19	59	23	119	0	62	20
2:00-2:15	93	24	14	61	22	101	0	63	23
Peak Hour	375	150	78	193	78	326	1	289	65
PHF	0.91	0.85	0.81	0.95	0.85	0.76	0.25	0.83	0.68

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Friday Peak
07/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑		↑↑		↑	↑	↑	↑
Traffic Volume (vph)	0	300	96	99	292	0	105	0	372	1	317	118
Future Volume (vph)	0	300	96	99	292	0	105	0	372	1	317	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		340	190		0	0		280	335		330
Storage Lanes	0		1	1		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3539	1583	1770	3539	0	3433	0	1583	1770	1863	1583
Flt Permitted				0.536			0.950			0.950		
Satd. Flow (perm)	0	3539	1583	998	3539	0	3433	0	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171						404			162
Link Speed (mph)		45			30			45			45	
Link Distance (ft)		832			833			1901			561	
Travel Time (s)		12.6			18.9			28.8			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	326	104	108	317	0	114	0	404	1	345	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	326	104	108	317	0	114	0	404	1	345	128
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2		1		1	1	2	1
Detector Template		Thru	Right	Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (ft)		100	20	20	100		20		20	20	100	20
Trailing Detector (ft)		0	0	0	0		0		0	0	0	0
Detector 1 Position(ft)		0	0	0	0		0		0	0	0	0
Detector 1 Size(ft)		6	20	20	6		20		20	20	6	20
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	D.P+P	NA		Prot		Perm	Prot	NA	Perm
Protected Phases		6		5	2		3			7	4	
Permitted Phases			6	6					3			4

Baseline
Existing

Synchro 10 Report
Page 1

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Friday Peak
07/18/2022

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		6	6	5	2		3		3	7	4	4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0		7.0		7.0	7.0	10.0	10.0
Minimum Split (s)		16.6	16.6	13.6	16.6		14.6		14.6	14.6	17.6	17.6
Total Split (s)		27.0	27.0	16.0	43.0		34.0		34.0	77.0	43.0	43.0
Total Split (%)		22.5%	22.5%	13.3%	35.8%		28.3%		28.3%	64.2%	35.8%	35.8%
Maximum Green (s)		20.4	20.4	9.4	36.4		26.4		26.4	69.4	35.4	35.4
Yellow Time (s)		4.8	4.8	4.8	4.8		5.5		5.5	5.5	5.5	5.5
All-Red Time (s)		1.8	1.8	1.8	1.8		2.1		2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6	6.6	6.6		7.6		7.6	7.6	7.6	7.6
Lead/Lag		Lag	Lag	Lead			Lead		Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes		Yes	Yes
Vehicle Extension (s)		3.5	3.5	2.5	3.5		2.5		2.5	2.5	4.0	4.0
Recall Mode		Min	Min	None	Min		None		None	None	None	None
Act Effect Green (s)		14.5	14.5	21.0	26.0		9.7		9.7	15.3	22.8	22.8
Actuated g/C Ratio		0.18	0.18	0.26	0.32		0.12		0.12	0.19	0.28	0.28
v/c Ratio		0.52	0.25	0.32	0.28		0.28		0.74	0.00	0.66	0.23
Control Delay		36.4	1.9	24.7	22.2		39.0		13.6	22.0	34.7	3.2
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		36.4	1.9	24.7	22.2		39.0		13.6	22.0	34.7	3.2
LOS		D	A	C	C		D		B	C	C	A
Approach Delay		28.0			22.9			19.2			26.2	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 81.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 23.9

Intersection LOS: C

Intersection Capacity Utilization 55.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Business 54/Business 54 Ramp & MO 242



Lanes, Volumes, Timings
6: Business 54 & Kestrel Ln

Friday Peak
07/18/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	40	13	464	22	9	503
Future Volume (vph)	40	13	464	22	9	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70	0		0	335	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539
Link Speed (mph)	30		45			45
Link Distance (ft)	685		1199			1901
Travel Time (s)	15.6		18.2			28.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	14	504	24	10	547
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	14	504	24	10	547
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	23.9%			ICU Level of Service A		
Analysis Period (min)	15					

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Friday Peak
07/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	31	484	58	40	45	534	364	63	28	366	149
Future Volume (vph)	77	31	484	58	40	45	534	364	63	28	366	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	75		95	820		0	150		0
Storage Lanes	1		1	1		1	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3387	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3387	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			526			136			95		48	
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		779			989			1559			1199	
Travel Time (s)		13.3			22.5			23.6			18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	34	526	63	43	49	580	396	68	30	398	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	34	526	63	43	49	580	396	68	30	560	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Baseline
Existing

Synchro 10 Report
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Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Friday Peak
07/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	17.0	39.5	39.5	14.4	36.9	36.9	33.4	55.2	55.2	10.9	32.7	
Total Split (%)	14.2%	32.9%	32.9%	12.0%	30.8%	30.8%	27.8%	46.0%	46.0%	9.1%	27.3%	
Maximum Green (s)	12.5	35.0	35.0	9.9	32.4	32.4	28.9	50.7	50.7	6.4	28.2	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	9.4	10.8	10.8	8.2	9.8	9.8	19.6	52.3	52.3	6.3	34.0	
Actuated g/C Ratio	0.11	0.12	0.12	0.09	0.11	0.11	0.22	0.59	0.59	0.07	0.38	
v/c Ratio	0.45	0.15	0.80	0.38	0.21	0.17	0.76	0.19	0.07	0.24	0.42	
Control Delay	48.9	37.8	13.9	49.2	40.4	1.2	40.4	11.6	1.7	49.6	22.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.9	37.8	13.9	49.2	40.4	1.2	40.4	11.6	1.7	49.6	22.6	
LOS	D	D	B	D	D	A	D	B	A	D	C	
Approach Delay		19.7			31.6			27.0			24.0	
Approach LOS		B			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 88.4

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 24.6

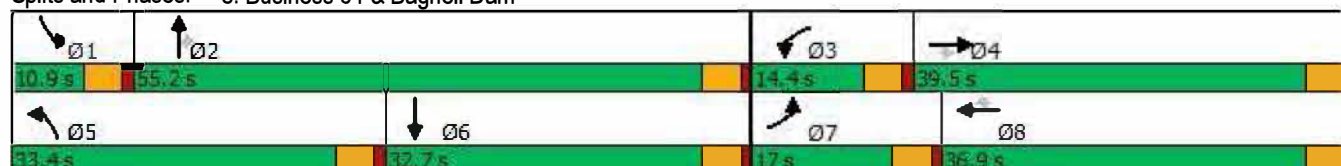
Intersection LOS: C

Intersection Capacity Utilization 60.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: Business 54 & Bagnell Dam



Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Sunday Peak
07/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑		↑↑		↑	↑	↑	↑
Traffic Volume (vph)	0	375	150	78	193	0	78	0	326	1	289	65
Future Volume (vph)	0	375	150	78	193	0	78	0	326	1	289	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		340	190		0	0		280	335		330
Storage Lanes	0		1	1		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3539	1583	1770	3539	0	3433	0	1583	1770	1863	1583
Flt Permitted				0.449			0.950			0.950		
Satd. Flow (perm)	0	3539	1583	836	3539	0	3433	0	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171						354			162
Link Speed (mph)		45			30			45			45	
Link Distance (ft)		832			833			1901			561	
Travel Time (s)		12.6			18.9			28.8			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	408	163	85	210	0	85	0	354	1	314	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	408	163	85	210	0	85	0	354	1	314	71
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2		1		1	1	2	1
Detector Template		Thru	Right	Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (ft)		100	20	20	100		20		20	20	100	20
Trailing Detector (ft)		0	0	0	0		0		0	0	0	0
Detector 1 Position(ft)		0	0	0	0		0		0	0	0	0
Detector 1 Size(ft)		6	20	20	6		20		20	20	6	20
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	D.P+P	NA		Prot		Perm	Prot	NA	Perm
Protected Phases		6		5	2		3			7	4	
Permitted Phases			6	6					3			4

Baseline
Existing

Synchro 10 Report
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Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Sunday Peak
07/18/2022

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		6	6	5	2		3		3	7	4	4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0		7.0		7.0	7.0	10.0	10.0
Minimum Split (s)		16.6	16.6	13.6	16.6		14.6		14.6	14.6	17.6	17.6
Total Split (s)		32.0	32.0	14.0	46.0		33.0		33.0	74.0	41.0	41.0
Total Split (%)		26.7%	26.7%	11.7%	38.3%		27.5%		27.5%	61.7%	34.2%	34.2%
Maximum Green (s)		25.4	25.4	7.4	39.4		25.4		25.4	66.4	33.4	33.4
Yellow Time (s)		4.8	4.8	4.8	4.8		5.5		5.5	5.5	5.5	5.5
All-Red Time (s)		1.8	1.8	1.8	1.8		2.1		2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6	6.6	6.6		7.6		7.6	7.6	7.6	7.6
Lead/Lag		Lag	Lag	Lead			Lead		Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes		Yes	Yes
Vehicle Extension (s)		3.5	3.5	2.5	3.5		2.5		2.5	2.5	4.0	4.0
Recall Mode		Min	Min	None	Min		None		None	None	None	None
Act Effect Green (s)		16.2	16.2	21.7	26.6		9.2		9.2	14.7	20.4	20.4
Actuated g/C Ratio		0.20	0.20	0.27	0.33		0.12		0.12	0.18	0.26	0.26
v/c Ratio		0.57	0.36	0.27	0.18		0.21		0.71	0.00	0.66	0.13
Control Delay		33.9	7.3	22.2	19.8		37.9		13.5	22.0	35.4	0.5
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		33.9	7.3	22.2	19.8		37.9		13.5	22.0	35.4	0.5
LOS		C	A	C	B		D		B	C	D	A
Approach Delay		26.3			20.5			18.2			29.0	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 79.5

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 23.8

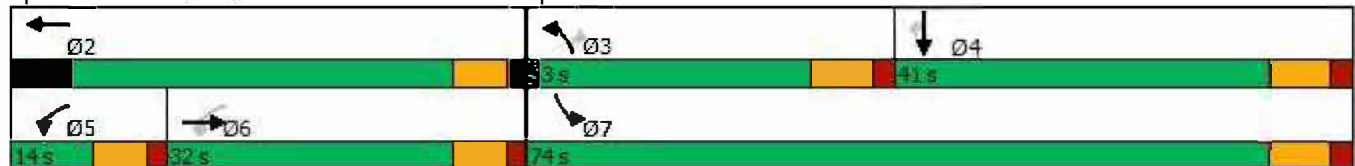
Intersection LOS: C

Intersection Capacity Utilization 55.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Business 54/Business 54 Ramp & MO 242



Lanes, Volumes, Timings
6: Business 54 & Kestrel Ln

Sunday Peak
07/18/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	66	23	381	45	16	501
Future Volume (vph)	66	23	381	45	16	501
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70	0		0	335	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539
Link Speed (mph)	30		45			45
Link Distance (ft)	685		1199			1901
Travel Time (s)	15.6		18.2			28.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	25	414	49	17	545
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	25	414	49	17	545
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	24.2%			ICU Level of Service A		
Analysis Period (min)	15					

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Sunday Peak
07/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	35	460	57	23	36	476	329	67	14	445	108
Future Volume (vph)	61	35	460	57	23	36	476	329	67	14	445	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	75		95	820		0	150		0
Storage Lanes	1		1	1		1	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.971	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3437	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3437	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			488			136			95		24	
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		779			989			1559			1199	
Travel Time (s)		13.3			22.5			23.6			18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	66	38	500	62	25	39	517	358	73	15	484	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	38	500	62	25	39	517	358	73	15	601	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Baseline
Existing

Synchro 10 Report
Page 4

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Sunday Peak
07/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	15.0	38.0	38.0	14.3	37.3	37.3	31.0	57.7	57.7	10.0	36.7	
Total Split (%)	12.5%	31.7%	31.7%	11.9%	31.1%	31.1%	25.8%	48.1%	48.1%	8.3%	30.6%	
Maximum Green (s)	10.5	33.5	33.5	9.8	32.8	32.8	26.5	53.2	53.2	5.5	32.2	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	8.5	10.7	10.7	8.2	10.4	10.4	18.2	55.8	55.8	5.6	34.5	
Actuated g/C Ratio	0.10	0.12	0.12	0.09	0.12	0.12	0.21	0.64	0.64	0.06	0.39	
v/c Ratio	0.39	0.17	0.81	0.38	0.11	0.13	0.72	0.16	0.07	0.13	0.44	
Control Delay	48.0	37.1	15.1	48.4	36.7	0.9	39.4	9.2	2.0	48.1	23.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.0	37.1	15.1	48.4	36.7	0.9	39.4	9.2	2.0	48.1	23.2	
LOS	D	D	B	D	D	A	D	A	A	D	C	
Approach Delay		20.0			31.4			25.1			23.8	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 87.4

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 23.8

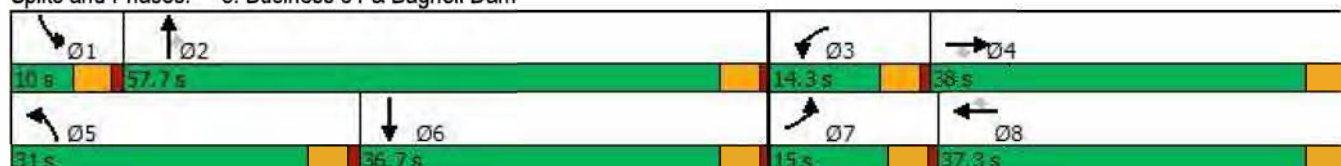
Intersection LOS: C

Intersection Capacity Utilization 59.6%

ICU Level of Service B

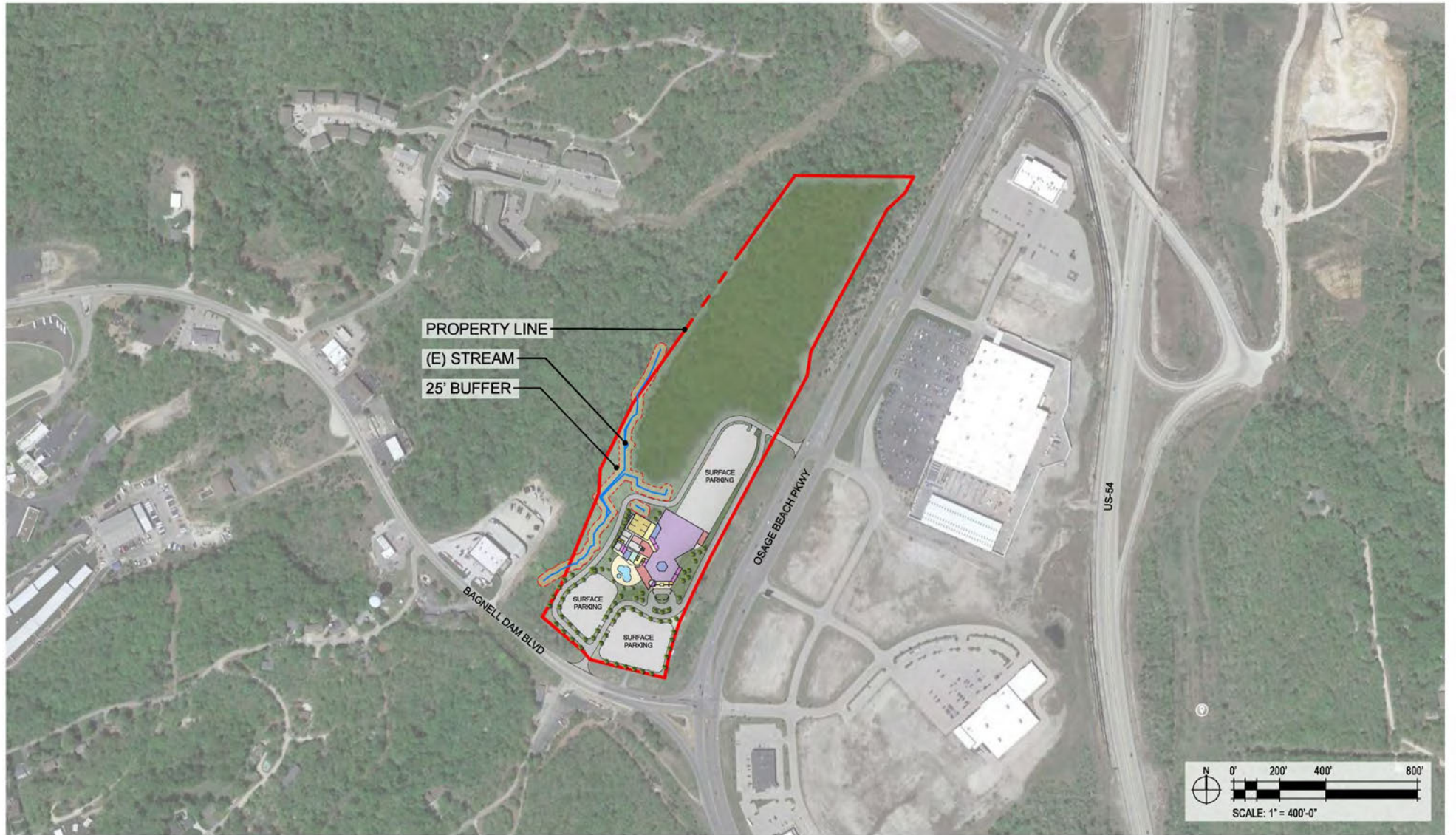
Analysis Period (min) 15

Splits and Phases: 8: Business 54 & Bagnell Dam



APPENDIX II ALTERNATIVE A

PREPARED BY:



TRIP GENERATION - ALTERNATIVE A																	
LAND USE	ITE CODE*	Size	Variable	24-Hour	24-HOUR	24-Hour	24-HOUR	FRIDAY	FRI	FRI	WEEKDAY		SUNDAY	SUN	SUN	WEEKDAY	
				Weekday Trip Generation	WEEKDAY	Sunday Trip Generation	WEEKDAY	PEAK HOUR RATE			% IN	% OUT	FRI PEAK ENTER EXIT			PEAK HOUR RATE	SUN PEAK ENTER EXIT
Full Development																	
Casino	—	750	Slot Machines	9.93	7,448	11.7	8,775	0.59	53%	47%	235	208	0.64	53%	47%	254	226
					7,448		8,775		TOTAL NEW TRIPS		235	208		TOTAL NEW TRIPS		254	226

*Given the lack of data provided by ITE for a full service casino, trip generation rates were obtained from a report created by HDR titled, "Trip Generation Characteristics of Small to Medium Sized Casinos". This generation rate has the other planned uses of the casino built into the numbers provided.

Sunday Peak Hour Calculations - Alternative A

N/S Street Osage Beach Pkwy
E/W Street Horseshoe Bend Pkwy
Growth Rate (GR) 2.00%
Years (n) 2

NewTrips
In 254
Out 226

Turn Movement	Existing Traffic	(1)	(2) Growth factor (1+GR) ⁿ	(1) x (2) Traffic Growth	NEW TRIPS			
					Dist. (Exhibit 3)	IN	Dist. (Exhibit 3)	OUT
					(5)	(6)	(7)	(8)
NBL	78	1.04	81	5%	226			
NBR	326	1.04	339	70%	226			
SBL	1	1.04	1					
SBT	269	1.04	301	35%	254			
SBR	65	1.04	68					
EBT	375	1.04	390					
EBR	150	1.04	156	5%	254			
WBL	78	1.04	81	35%	254			
WBT	193	1.04	201					

Trips IN/OUT	Projected Turn Movement for 2024	A+B
11	92	VEH/HR
159	498	VEH/HR
0	1	VEH/HR
69	350	VEH/HR
0	68	VEH/HR
0	390	VEH/HR
113	169	VEH/HR
89	170	VEH/HR
0	201	VEH/HR

Existing Traffic		
3,940	65	MO 54 Ramp
9,570		10,610
189	375	193
150		78
Horseshoe Bend Pkwy	78	326
10,230	921	Osage Beach Pkwy

Existing Traffic Projected to Construction Year		
4,110	68	MO 54 Ramp
9,960		11,240
989	390	201
156		81
Horseshoe Bend Pkwy	81	339
10,640	958	Osage Beach Pkwy

Site Traffic Assigned for Construction Year		
990	0	MO 54 Ramp
270		2,760
24	0	248
13		89
Horseshoe Bend Pkwy	11	159
4,010	361	Osage Beach Pkwy

Projected Full Buildout Traffic		
5,100	68	MO 54 Ramp
10,220		14,000
920	390	201
169		170
Horseshoe Bend Pkwy	92	498
14,660	1319	Osage Beach Pkwy

N/S Street Osage Beach Pkwy
E/W Street Access P2 / Kestrel Ln
Growth Rate (GR) 2.00%
Years (n) 2

NewTrips
In 254
Out 226

Turn Movement	Existing Traffic	(1)	(2) Growth factor (1+GR) ⁿ	(1) x (2) Traffic Growth	NEW TRIPS			
					Dist. (Exhibit 3)	IN	Dist. (Exhibit 3)	OUT
					(5)	(6)	(7)	(8)
NBL	0	1.04	0	2%	254			
NBT	381	1.04	396					
NBR	45	1.04	47					
SBL	16	1.04	17	67%	254			
SBT	501	1.04	521	8%	254			
SBR	0	1.04	0					
EBL	0	1.04	0					
EBT	0	1.04	0					
EBR	0	1.04	0					
WBL	66	1.04	69					
WBT	0	1.04	0					
WBR	23	1.04	24					

Trips IN/OUT	Projected Turn Movement for 2024	A+B
5	5	VEH/HR
161	557	VEH/HR
0	47	VEH/HR
0	17	VEH/HR
170	691	VEH/HR
20	20	VEH/HR
10	10	VEH/HR
0	0	VEH/HR
2	2	VEH/HR
0	69	VEH/HR
0	0	VEH/HR
0	24	VEH/HR

Existing Traffic		
10,230	921	Osage Beach Pkwy
0	0	1,670
0	0	0
0	0	0
Access P2	66	Kestrel Ln
11,030	0	381
	993	45

Existing Traffic Projected to Construction Year		
10,640	958	Osage Beach Pkwy
0	0	1,740
0	0	0
0	0	0
Access P2	69	Kestrel Ln
11,480	0	396
	1033	47

Site Traffic Assigned for Construction Year		
4,010	361	Osage Beach Pkwy
410	10	0
37	0	0
2	0	0
Access P2	69	Kestrel Ln
3,760	5	161
	338	0

Projected Full Buildout Traffic		
14,660	1319	Osage Beach Pkwy
410	10	1,740
37	0	0
2	0	0
Access P2	69	Kestrel Ln
15,230	5	557
	1371	47

N/S Street Osage Beach Pkwy
E/W Street Bagnell Dam Blvd
Growth Rate (GR) 2.00%
Years (n) 2

NewTrips
In 254
Out 226

Turn Movement	Existing Traffic	(1)	(2) Growth factor (1+GR) ⁿ	(1) x (2) Traffic Growth	NEW TRIPS			
					Dist. (Exhibit 3)	IN	Dist. (Exhibit 3)	OUT
					(5)	(6)	(7)	(8)
NBL	476	1.04	496	8%	254			
NBT	329	1.04	343	2%	254			
NBR	67	1.04	70					
SBL	14	1.04	15	67%	254			
SBT	445	1.04	463					
SBR	108	1.04	112					
EBL	81	1.04	83					
EBT	35	1.04	36					
EBR	480	1.04	479					
WBL	57	1.04	59	9%	226			
WBT	23	1.04	24					
WBR	36	1.04	37					

Trips IN/OUT	Projected Turn Movement for 2024	A+B
20	516	VEH/HR
6	349	VEH/HR
0	70	VEH/HR
0	15	VEH/HR
2	465	VEH/HR
170	282	VEH/HR
160	223	VEH/HR
0	36	VEH/HR
21	500	VEH/HR
0	59	VEH/HR
0	24	VEH/HR
0	37	VEH/HR

Existing Traffic		
11,030	993	Osage Beach Pkwy
12,920	108	445
163	61	36
460	35	23
Bagnell Dam Blvd	57	232
20,380	476	329
	1834	67

Existing Traffic Projected to Construction Year		
11,480	1033	Osage Beach Pkwy
13,440	112	463
1210	63	37
479	36	24
Bagnell Dam Blvd	59	241
21,220	496	343
	1910	70

Site Traffic Assigned for Construction Year		
3,760	338	Osage Beach Pkwy
4,120	170	2
371	160	0
21	0	0
Bagnell Dam Blvd	0	0
540	20	6
	49	0

Projected Full Buildout Traffic		
15,230	1371	Osage Beach Pkwy
4,120	170	2
371	160	0
21	0	0
Bagnell Dam Blvd	0	0
21,770	516	349
	1959	70

N/S Street Access P1
E/W Street Bagnell Dam Blvd
Growth Rate (GR) 2.00%
Years (n) 2

NewTrips
In 254
Out 226

Turn Movement	Existing Traffic	(1)	(2) Growth factor (1+GR) ⁿ	(1) x (2) Traffic Growth	NEW TRIPS			
					Dist. (Exhibit 3)	IN	Dist. (Exhibit 3)	OUT
					(5)	(6)	(7)	(8)
SBL	0	1.04	0					
SBR	0	1.04	0					
EBL	0	1.04	0					
EBT	556	1.04	578	15%	254			
WBT	607	1.04	632					
WBR	0	1.04	0	75%	254			

Trips IN/OUT	Projected Turn Movement for 2024	A+B
181	181	VEH/HR
34	34	VEH/HR
38	38	VEH/HR
0	578	VEH/HR
0	632	VEH/HR
190	190	VEH/HR

Existing Traffic		
0	0	Access P1
12,920	0	12,920
631	556	607
Bagnell Dam Blvd	0	1,163

Existing Traffic Projected to Construction Year		
0	0	Access P1
13,440	0	13,440
632	578	632
Bagnell Dam Blvd	0	1,210

Site Traffic Assigned for Construction Year		
4,920	34	Access P1
800	38	4,120
72	0	371
Bagnell Dam Blvd	0	1,581

Projected Full Buildout Traffic		
4,920	34	Access P1
14,240	38	190
728	578	632
Bagnell Dam Blvd	0	1,581

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑		↖		↗	↖	↑	↗
Traffic Volume (vph)	0	312	112	185	304	0	120	0	533	1	412	123
Future Volume (vph)	0	312	112	185	304	0	120	0	533	1	412	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		340	190		0	0		280	335		330
Storage Lanes	0		1	1		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3539	1583	1770	3539	0	3433	0	1583	1770	1863	1583
Flt Permitted				0.470			0.950			0.950		
Satd. Flow (perm)	0	3539	1583	875	3539	0	3433	0	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171						579			162
Link Speed (mph)		45			30			45			45	
Link Distance (ft)		832			833			1901			561	
Travel Time (s)		12.6			18.9			28.8			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	339	122	201	330	0	130	0	579	1	448	134
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	339	122	201	330	0	130	0	579	1	448	134
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2		1		1	1	2	1
Detector Template		Thru	Right	Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (ft)		100	20	20	100		20		20	20	100	20
Trailing Detector (ft)		0	0	0	0		0		0	0	0	0
Detector 1 Position(ft)		0	0	0	0		0		0	0	0	0
Detector 1 Size(ft)		6	20	20	6		20		20	20	6	20
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		CI+Ex			CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	D.P+P	NA		Prot		Perm	Prot	NA	Perm
Protected Phases		6		5	2		3			7	4	
Permitted Phases			6	6					3			4

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative A

01/03/2024

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		6	6	5	2		3		3	7	4	4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0		7.0		7.0	7.0	10.0	10.0
Minimum Split (s)		16.6	16.6	13.6	16.6		14.6		14.6	14.6	17.6	17.6
Total Split (s)		26.0	26.0	18.0	44.0		33.0		33.0	76.0	43.0	43.0
Total Split (%)		21.7%	21.7%	15.0%	36.7%		27.5%		27.5%	63.3%	35.8%	35.8%
Maximum Green (s)		19.4	19.4	11.4	37.4		25.4		25.4	68.4	35.4	35.4
Yellow Time (s)		4.8	4.8	4.8	4.8		5.5		5.5	5.5	5.5	5.5
All-Red Time (s)		1.8	1.8	1.8	1.8		2.1		2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6	6.6	6.6		7.6		7.6	7.6	7.6	7.6
Lead/Lag		Lag	Lag	Lead			Lead		Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes		Yes	Yes
Vehicle Extension (s)		3.5	3.5	2.5	3.5		2.5		2.5	2.5	4.0	4.0
Recall Mode		Min	Min	None	Min		None		None	None	None	None
Act Effect Green (s)		15.1	15.1	26.0	32.8		11.5		11.5	17.0	28.8	28.8
Actuated g/C Ratio		0.16	0.16	0.27	0.34		0.12		0.12	0.18	0.30	0.30
v/c Ratio		0.61	0.31	0.59	0.27		0.31		0.83	0.00	0.80	0.23
Control Delay		44.3	4.2	34.8	25.2		41.9		14.7	24.0	43.8	3.7
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		44.3	4.2	34.8	25.2		41.9		14.7	24.0	43.8	3.7
LOS		D	A	C	C		D		B	C	D	A
Approach Delay		33.7			28.8			19.7			34.5	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 95.5

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 28.4

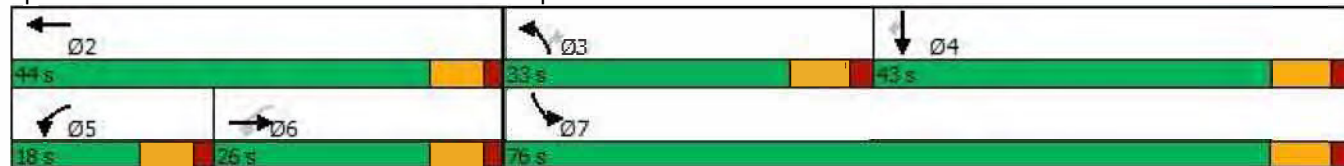
Intersection LOS: C

Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Business 54/Business 54 Ramp & MO 242



Lanes, Volumes, Timings
6: Business 54 & Access P2/Kestrel Ln

Alternative A
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	2	42	0	14	5	631	23	9	680	19
Future Volume (vph)	9	0	2	42	0	14	5	631	23	9	680	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		70	0		0	335		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt		0.977				0.850			0.850		0.996	
Flt Protected		0.960			0.950					0.950		
Satd. Flow (prot)	0	1747	0	0	1770	1583	0	3539	1583	1770	3525	0
Flt Permitted		0.960			0.950					0.950		
Satd. Flow (perm)	0	1747	0	0	1770	1583	0	3539	1583	1770	3525	0
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		331			685			1199			1901	
Travel Time (s)		7.5			15.6			18.2			28.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	0	2	46	0	15	5	686	25	10	739	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	46	15	0	691	25	10	760	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.1%						ICU Level of Service A					
Analysis Period (min)	15											

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative A
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	32	523	60	42	47	576	384	66	29	383	312
Future Volume (vph)	228	32	523	60	42	47	576	384	66	29	383	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	75		95	820		0	150		0
Storage Lanes	1		1	1		1	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.933	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3302	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3302	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			509			177			136		169	
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		643			989			1559			1199	
Travel Time (s)		11.0			22.5			23.6			18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	248	35	568	65	46	51	626	417	72	32	416	339
Shared Lane Traffic (%)												
Lane Group Flow (vph)	248	35	568	65	46	51	626	417	72	32	755	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative A
01/03/2024

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	28.0	37.5	37.5	13.0	22.5	22.5	32.0	58.5	58.5	11.0	37.5	
Total Split (%)	23.3%	31.3%	31.3%	10.8%	18.8%	18.8%	26.7%	48.8%	48.8%	9.2%	31.3%	
Maximum Green (s)	23.5	33.0	33.0	8.5	18.0	18.0	27.5	54.0	54.0	6.5	33.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	18.8	20.0	20.0	7.8	9.0	9.0	22.9	56.4	56.4	6.4	34.9	
Actuated g/C Ratio	0.19	0.20	0.20	0.08	0.09	0.09	0.23	0.56	0.56	0.06	0.34	
v/c Ratio	0.76	0.10	0.79	0.48	0.28	0.17	0.81	0.21	0.08	0.29	0.61	
Control Delay	56.2	34.9	14.4	61.5	50.7	1.2	47.3	14.7	0.2	57.8	25.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	56.2	34.9	14.4	61.5	50.7	1.2	47.3	14.7	0.2	57.8	25.9	
LOS	E	C	B	E	D	A	D	B	A	E	C	
Approach Delay		27.4			39.5			32.0			27.2	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 101.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 29.8

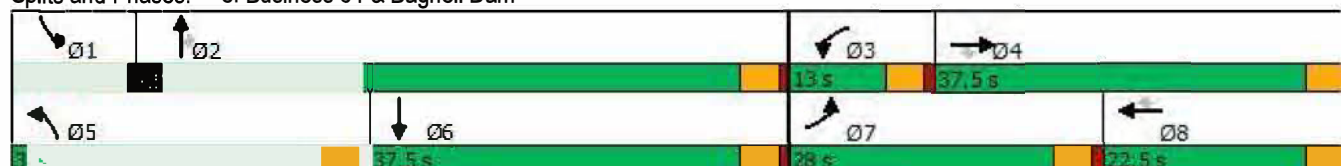
Intersection LOS: C

Intersection Capacity Utilization 68.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 8: Business 54 & Bagnell Dam



Lanes, Volumes, Timings
12: Bagnell Dam & Access P1

Alternative A
01/03/2024

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	616	753	177	167	31
Future Volume (vph)	35	616	753	177	167	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.974		0.979	
Flt Protected	0.950				0.960	
Satd. Flow (prot)	1770	1863	1814	0	1751	0
Flt Permitted	0.950				0.960	
Satd. Flow (perm)	1770	1863	1814	0	1751	0
Link Speed (mph)		40	40		30	
Link Distance (ft)		436	103		292	
Travel Time (s)		7.4	1.8		6.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	670	818	192	182	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	670	1010	0	216	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane		Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	68.2%			ICU Level of Service C		
Analysis Period (min)	15					

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑		↖		↗	↖	↑	↗
Traffic Volume (vph)	0	390	169	170	201	0	92	0	498	1	390	68
Future Volume (vph)	0	390	169	170	201	0	92	0	498	1	390	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		340	190		0	0		280	335		330
Storage Lanes	0		1	1		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3539	1583	1770	3539	0	3433	0	1583	1770	1863	1583
Flt Permitted				0.382			0.950			0.950		
Satd. Flow (perm)	0	3539	1583	712	3539	0	3433	0	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184						541			162
Link Speed (mph)		45			30			45			45	
Link Distance (ft)		832			833			1901			561	
Travel Time (s)		12.6			18.9			28.8			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	424	184	185	218	0	100	0	541	1	424	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	424	184	185	218	0	100	0	541	1	424	74
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2		1		1	1	2	1
Detector Template		Thru	Right	Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (ft)		100	20	20	100		20		20	20	100	20
Trailing Detector (ft)		0	0	0	0		0		0	0	0	0
Detector 1 Position(ft)		0	0	0	0		0		0	0	0	0
Detector 1 Size(ft)		6	20	20	6		20		20	20	6	20
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		CI+Ex			CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	D.P+P	NA		Prot		Perm	Prot	NA	Perm
Protected Phases		6		5	2		3			7	4	
Permitted Phases			6	6					3			4

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative A

01/03/2024

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
Detector Phase		6	6	5	2		3		3	7	4	4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0		7.0		7.0	7.0	10.0	10.0
Minimum Split (s)		16.6	16.6	13.6	16.6		14.6		14.6	14.6	17.6	17.6
Total Split (s)		28.0	28.0	18.0	46.0		32.0		32.0	74.0	42.0	42.0
Total Split (%)		23.3%	23.3%	15.0%	38.3%		26.7%		26.7%	61.7%	35.0%	35.0%
Maximum Green (s)		21.4	21.4	11.4	39.4		24.4		24.4	66.4	34.4	34.4
Yellow Time (s)		4.8	4.8	4.8	4.8		5.5		5.5	5.5	5.5	5.5
All-Red Time (s)		1.8	1.8	1.8	1.8		2.1		2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6	6.6	6.6		7.6		7.6	7.6	7.6	7.6
Lead/Lag		Lag	Lag	Lead			Lead		Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes		Yes	Yes
Vehicle Extension (s)		3.5	3.5	2.5	3.5		2.5		2.5	2.5	4.0	4.0
Recall Mode		Min	Min	None	Min		None		None	None	None	None
Act Effect Green (s)		17.7	17.7	28.2	35.0		10.8		10.8	16.6	27.6	27.6
Actuated g/C Ratio		0.18	0.18	0.29	0.36		0.11		0.11	0.17	0.29	0.29
v/c Ratio		0.65	0.42	0.57	0.17		0.26		0.82	0.00	0.79	0.13
Control Delay		43.1	9.1	32.3	22.9		42.5		15.2	25.0	44.5	0.5
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		43.1	9.1	32.3	22.9		42.5		15.2	25.0	44.5	0.5
LOS		D	A	C	C		D		B	C	D	A
Approach Delay		32.8			27.2			19.4			37.9	
Approach LOS		C			C			B			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 95.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 28.9

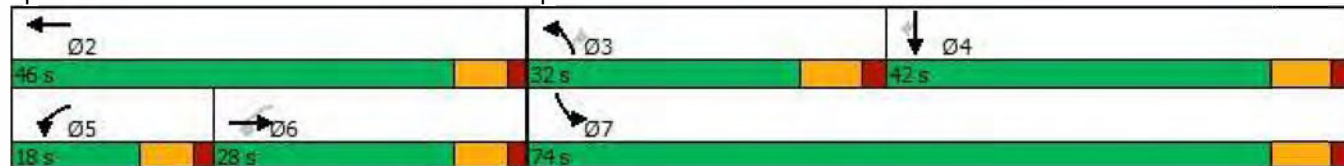
Intersection LOS: C

Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Business 54/Business 54 Ramp & MO 242



Lanes, Volumes, Timings
6: Business 54 & Access P2/Kestrel Ln

Alternative A
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	0	2	69	0	24	5	557	47	17	691	20
Future Volume (vph)	10	0	2	69	0	24	5	557	47	17	691	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		70	0		0	335		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt		0.979				0.850			0.850		0.996	
Flt Protected		0.959			0.950					0.950		
Satd. Flow (prot)	0	1749	0	0	1770	1583	0	3539	1583	1770	3525	0
Flt Permitted		0.959			0.950					0.950		
Satd. Flow (perm)	0	1749	0	0	1770	1583	0	3539	1583	1770	3525	0
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		331			685			1199			1901	
Travel Time (s)		7.5			15.6			18.2			28.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	2	75	0	26	5	605	51	18	751	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	75	26	0	610	51	18	773	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.4%						ICU Level of Service A					
Analysis Period (min)	15											

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	36	500	59	24	37	516	349	70	15	465	282
Future Volume (vph)	223	36	500	59	24	37	516	349	70	15	465	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	75		95	820		0	150		0
Storage Lanes	1		1	1		1	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.943	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3337	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3337	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			455			177			136		108	
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		668			989			1559			1199	
Travel Time (s)		11.4			22.5			23.6			18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	242	39	543	64	26	40	561	379	76	16	505	307
Shared Lane Traffic (%)												
Lane Group Flow (vph)	242	39	543	64	26	40	561	379	76	16	812	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative A
01/03/2024

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	28.0	38.5	38.5	12.0	22.5	22.5	30.0	59.7	59.7	9.8	39.5	
Total Split (%)	23.3%	32.1%	32.1%	10.0%	18.8%	18.8%	25.0%	49.8%	49.8%	8.2%	32.9%	
Maximum Green (s)	23.5	34.0	34.0	7.5	18.0	18.0	25.5	55.2	55.2	5.3	35.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	18.2	19.4	19.4	7.3	8.3	8.3	20.8	58.4	58.4	5.4	36.5	
Actuated g/C Ratio	0.18	0.19	0.19	0.07	0.08	0.08	0.21	0.59	0.59	0.05	0.37	
v/c Ratio	0.75	0.11	0.80	0.50	0.17	0.14	0.78	0.18	0.08	0.17	0.63	
Control Delay	55.2	34.3	17.4	63.1	48.0	1.0	47.1	12.7	0.2	55.4	27.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	55.2	34.3	17.4	63.1	48.0	1.0	47.1	12.7	0.2	55.4	27.7	
LOS	E	C	B	E	D	A	D	B	A	E	C	
Approach Delay		29.3			40.9			30.7			28.2	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 99.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 30.0

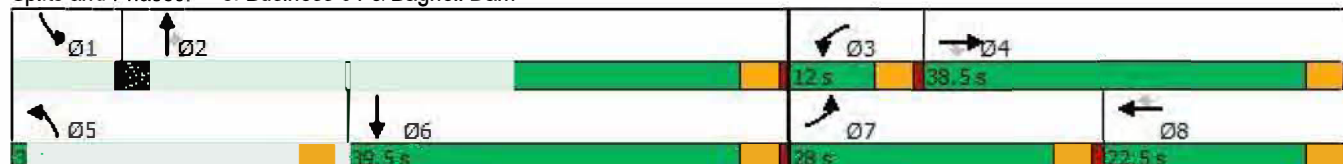
Intersection LOS: C

Intersection Capacity Utilization 68.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 8: Business 54 & Bagnell Dam



Lanes, Volumes, Timings
12: Bagnell Dam & Access P1

Alternative A
01/03/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	38	578	632	190	181	34
Future Volume (vph)	38	578	632	190	181	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.969		0.979	
Flt Protected	0.950				0.960	
Satd. Flow (prot)	1770	1863	1805	0	1751	0
Flt Permitted	0.950				0.960	
Satd. Flow (perm)	1770	1863	1805	0	1751	0
Link Speed (mph)		40	40		30	
Link Distance (ft)		436	78		292	
Travel Time (s)		7.4	1.3		6.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	628	687	207	197	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	628	894	0	234	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane		Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 63.6% ICU Level of Service B

Analysis Period (min) 15

2024 Turn Lane Warrants:

Access P1 & Bagnell Dam Boulevard:

Osage Beach Parkway & Access P2:

940.9.9 Right Turn Lane Guidelines for Four-Lane Roadways, Osage Beach Parkway & Access P2, Southbound Right

Legend:

- - Friday Peak
- - Sunday Peak

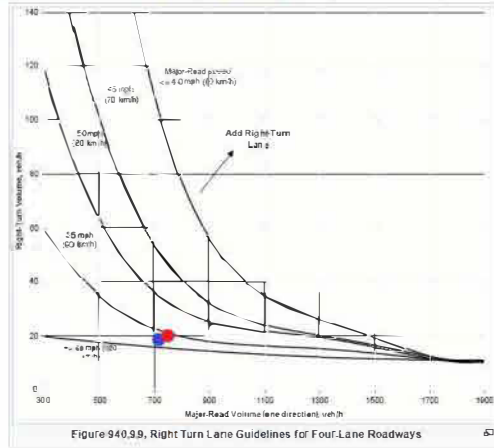


Figure 940.9.9, Right Turn Lane Guidelines for Four-Lane Roadways

The following data are required:

1. Advancing Volume (veh/hr) - The advancing volume is to include the right-turn, left-turn and through movements in the same direction as the right turning vehicle. **708 veh/hr**
2. Right Turning Volume (veh/hr) - The right turning volume is the number of advancing vehicles turning right. **19 veh/hr**
3. Operating Speed (mph) - The greatest of anticipated operating speed, measured 85th percentile speed or posted speed. **45 MPH**

Note: Right turn lane not warranted for right turn volume less than 10 vph. However, criteria other than volume, e.g. crash experience, may be used to justify a right turn lane.

If the combination of major road approach volume and right-turn volume intersects above or to the right of the speed trend line corresponding the major road operating speed, then a right-turn lane is appropriate.

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑		↖		↗	↖	↑	↗
Traffic Volume (vph)	0	312	112	185	304	0	120	0	533	1	412	123
Future Volume (vph)	0	312	112	185	304	0	120	0	533	1	412	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		340	190		0	0		280	335		330
Storage Lanes	0		1	1		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3539	1583	1770	3539	0	3433	0	1583	1770	1863	1583
Flt Permitted				0.470			0.950			0.950		
Satd. Flow (perm)	0	3539	1583	875	3539	0	3433	0	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171						579			162
Link Speed (mph)		45			30			45			45	
Link Distance (ft)		832			833			1901			561	
Travel Time (s)		12.6			18.9			28.8			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	339	122	201	330	0	130	0	579	1	448	134
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	339	122	201	330	0	130	0	579	1	448	134
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2		1		1	1	2	1
Detector Template		Thru	Right	Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (ft)		100	20	20	100		20		20	20	100	20
Trailing Detector (ft)		0	0	0	0		0		0	0	0	0
Detector 1 Position(ft)		0	0	0	0		0		0	0	0	0
Detector 1 Size(ft)		6	20	20	6		20		20	20	6	20
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		CI+Ex			CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	D.P+P	NA		Prot		Perm	Prot	NA	Perm
Protected Phases		6		5	2		3			7	4	
Permitted Phases			6	6					3			4

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		6	6	5	2		3		3	7	4	4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0		7.0		7.0	7.0	10.0	10.0
Minimum Split (s)		16.6	16.6	13.6	16.6		14.6		14.6	14.6	17.6	17.6
Total Split (s)		26.0	26.0	18.0	44.0		33.0		33.0	76.0	43.0	43.0
Total Split (%)		21.7%	21.7%	15.0%	36.7%		27.5%		27.5%	63.3%	35.8%	35.8%
Maximum Green (s)		19.4	19.4	11.4	37.4		25.4		25.4	68.4	35.4	35.4
Yellow Time (s)		4.8	4.8	4.8	4.8		5.5		5.5	5.5	5.5	5.5
All-Red Time (s)		1.8	1.8	1.8	1.8		2.1		2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6	6.6	6.6		7.6		7.6	7.6	7.6	7.6
Lead/Lag		Lag	Lag	Lead			Lead		Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes		Yes	Yes
Vehicle Extension (s)		3.5	3.5	2.5	3.5		2.5		2.5	2.5	4.0	4.0
Recall Mode		Min	Min	None	Min		None		None	None	None	None
Act Effect Green (s)		15.1	15.1	26.0	32.8		11.5		11.5	17.0	28.8	28.8
Actuated g/C Ratio		0.16	0.16	0.27	0.34		0.12		0.12	0.18	0.30	0.30
v/c Ratio		0.61	0.31	0.59	0.27		0.31		0.83	0.00	0.80	0.23
Control Delay		44.3	4.2	34.8	25.2		41.9		14.7	24.0	43.8	3.7
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		44.3	4.2	34.8	25.2		41.9		14.7	24.0	43.8	3.7
LOS		D	A	C	C		D		B	C	D	A
Approach Delay		33.7			28.8			19.7			34.5	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 95.5

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 28.4

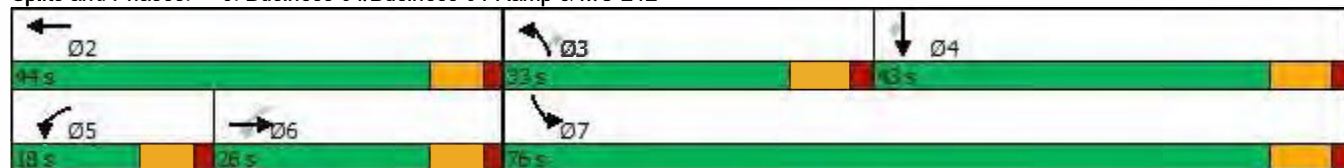
Intersection LOS: C

Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Business 54/Business 54 Ramp & MO 242



Lanes, Volumes, Timings
6: Business 54 & Access P2/Kestrel Ln

Alternative A
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	2	42	0	14	5	631	23	9	680	19
Future Volume (vph)	9	0	2	42	0	14	5	631	23	9	680	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		70	0		0	335		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt		0.977				0.850			0.850		0.996	
Flt Protected		0.960			0.950					0.950		
Satd. Flow (prot)	0	1747	0	0	1770	1583	0	3539	1583	1770	3525	0
Flt Permitted		0.960			0.950					0.950		
Satd. Flow (perm)	0	1747	0	0	1770	1583	0	3539	1583	1770	3525	0
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		331			685			1199			1901	
Travel Time (s)		7.5			15.6			18.2			28.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	0	2	46	0	15	5	686	25	10	739	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	46	15	0	691	25	10	760	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.1%						ICU Level of Service A					
Analysis Period (min)	15											

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	32	523	60	42	47	576	384	66	29	383	312
Future Volume (vph)	228	32	523	60	42	47	576	384	66	29	383	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	75		95	820		0	150		0
Storage Lanes	1		1	1		1	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.933	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3302	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3302	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			509			177			136		169	
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		542			989			1559			1199	
Travel Time (s)		9.2			22.5			23.6			18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	248	35	568	65	46	51	626	417	72	32	416	339
Shared Lane Traffic (%)												
Lane Group Flow (vph)	248	35	568	65	46	51	626	417	72	32	755	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative A
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	28.0	37.5	37.5	13.0	22.5	22.5	32.0	58.5	58.5	11.0	37.5	
Total Split (%)	23.3%	31.3%	31.3%	10.8%	18.8%	18.8%	26.7%	48.8%	48.8%	9.2%	31.3%	
Maximum Green (s)	23.5	33.0	33.0	8.5	18.0	18.0	27.5	54.0	54.0	6.5	33.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	18.8	20.0	20.0	7.8	9.0	9.0	22.9	56.4	56.4	6.4	34.9	
Actuated g/C Ratio	0.19	0.20	0.20	0.08	0.09	0.09	0.23	0.56	0.56	0.06	0.34	
v/c Ratio	0.76	0.10	0.79	0.48	0.28	0.17	0.81	0.21	0.08	0.29	0.61	
Control Delay	56.2	34.9	14.4	61.5	50.7	1.2	47.3	14.7	0.2	57.8	25.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	56.2	34.9	14.4	61.5	50.7	1.2	47.3	14.7	0.2	57.8	25.9	
LOS	E	C	B	E	D	A	D	B	A	E	C	
Approach Delay		27.4			39.5			32.0			27.2	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 101.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 29.8

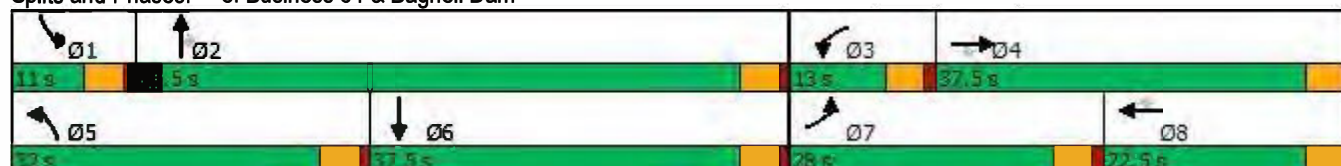
Intersection LOS: C

Intersection Capacity Utilization 68.4%

ICU Level of Service C

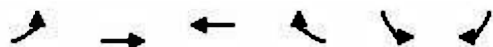
Analysis Period (min) 15

Splits and Phases: 8: Business 54 & Bagnell Dam



Lanes, Volumes, Timings
12: Bagnell Dam & Access P1

Alternative A
01/03/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	616	753	177	167	31
Future Volume (vph)	35	616	753	177	167	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			90	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.979	
Flt Protected	0.950				0.960	
Satd. Flow (prot)	1770	1863	1863	1583	1751	0
Flt Permitted	0.950				0.960	
Satd. Flow (perm)	1770	1863	1863	1583	1751	0
Link Speed (mph)		40	40		30	
Link Distance (ft)		436	204		292	
Travel Time (s)		7.4	3.5		6.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	670	818	192	182	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	670	818	192	216	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane		Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.4% ICU Level of Service B

Analysis Period (min) 15

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑		↖		↗	↖	↑	↗
Traffic Volume (vph)	0	390	169	170	201	0	92	0	498	1	390	68
Future Volume (vph)	0	390	169	170	201	0	92	0	498	1	390	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		340	190		0	0		280	335		330
Storage Lanes	0		1	1		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3539	1583	1770	3539	0	3433	0	1583	1770	1863	1583
Flt Permitted				0.382			0.950			0.950		
Satd. Flow (perm)	0	3539	1583	712	3539	0	3433	0	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184						541			162
Link Speed (mph)		45			30			45			45	
Link Distance (ft)		832			833			1901			561	
Travel Time (s)		12.6			18.9			28.8			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	424	184	185	218	0	100	0	541	1	424	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	424	184	185	218	0	100	0	541	1	424	74
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2		1		1	1	2	1
Detector Template		Thru	Right	Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (ft)		100	20	20	100		20		20	20	100	20
Trailing Detector (ft)		0	0	0	0		0		0	0	0	0
Detector 1 Position(ft)		0	0	0	0		0		0	0	0	0
Detector 1 Size(ft)		6	20	20	6		20		20	20	6	20
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		CI+Ex			CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	D.P+P	NA		Prot		Perm	Prot	NA	Perm
Protected Phases		6		5	2		3			7	4	
Permitted Phases			6	6					3			4

Lanes, Volumes, Timings 3: Business 54/Business 54 Ramp & MO 242

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		6	6	5	2		3		3	7	4	4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0		7.0		7.0	7.0	10.0	10.0
Minimum Split (s)		16.6	16.6	13.6	16.6		14.6		14.6	14.6	17.6	17.6
Total Split (s)		28.0	28.0	18.0	46.0		32.0		32.0	74.0	42.0	42.0
Total Split (%)		23.3%	23.3%	15.0%	38.3%		26.7%		26.7%	61.7%	35.0%	35.0%
Maximum Green (s)		21.4	21.4	11.4	39.4		24.4		24.4	66.4	34.4	34.4
Yellow Time (s)		4.8	4.8	4.8	4.8		5.5		5.5	5.5	5.5	5.5
All-Red Time (s)		1.8	1.8	1.8	1.8		2.1		2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6	6.6	6.6		7.6		7.6	7.6	7.6	7.6
Lead/Lag		Lag	Lag	Lead			Lead		Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes		Yes	Yes
Vehicle Extension (s)		3.5	3.5	2.5	3.5		2.5		2.5	2.5	4.0	4.0
Recall Mode		Min	Min	None	Min		None		None	None	None	None
Act Effect Green (s)		17.7	17.7	28.2	35.0		10.8		10.8	16.6	27.6	27.6
Actuated g/C Ratio		0.18	0.18	0.29	0.36		0.11		0.11	0.17	0.29	0.29
v/c Ratio		0.65	0.42	0.57	0.17		0.26		0.82	0.00	0.79	0.13
Control Delay		43.1	9.1	32.3	22.9		42.5		15.2	25.0	44.5	0.5
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		43.1	9.1	32.3	22.9		42.5		15.2	25.0	44.5	0.5
LOS		D	A	C	C		D		B	C	D	A
Approach Delay		32.8			27.2			19.4			37.9	
Approach LOS		C			C			B			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 95.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 28.9

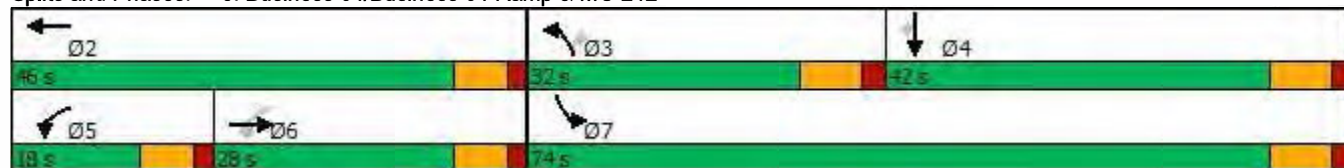
Intersection LOS: C

Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Business 54/Business 54 Ramp & MO 242



Lanes, Volumes, Timings
6: Business 54 & Access P2/Kestrel Ln

Alternative A
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	0	2	69	0	24	5	557	47	17	691	20
Future Volume (vph)	10	0	2	69	0	24	5	557	47	17	691	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		70	0		0	335		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt		0.979				0.850			0.850		0.996	
Flt Protected		0.959			0.950					0.950		
Satd. Flow (prot)	0	1749	0	0	1770	1583	0	3539	1583	1770	3525	0
Flt Permitted		0.959			0.950					0.950		
Satd. Flow (perm)	0	1749	0	0	1770	1583	0	3539	1583	1770	3525	0
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		331			685			1199			1901	
Travel Time (s)		7.5			15.6			18.2			28.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	2	75	0	26	5	605	51	18	751	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	75	26	0	610	51	18	773	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.4%						ICU Level of Service A					
Analysis Period (min)	15											

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	36	500	59	24	37	516	349	70	15	465	282
Future Volume (vph)	223	36	500	59	24	37	516	349	70	15	465	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	75		95	820		0	150		0
Storage Lanes	1		1	1		1	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.943	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3337	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3337	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			455			177			136		108	
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		535			989			1559			1199	
Travel Time (s)		9.1			22.5			23.6			18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	242	39	543	64	26	40	561	379	76	16	505	307
Shared Lane Traffic (%)												
Lane Group Flow (vph)	242	39	543	64	26	40	561	379	76	16	812	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative A

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	28.0	38.5	38.5	12.0	22.5	22.5	30.0	59.7	59.7	9.8	39.5	
Total Split (%)	23.3%	32.1%	32.1%	10.0%	18.8%	18.8%	25.0%	49.8%	49.8%	8.2%	32.9%	
Maximum Green (s)	23.5	34.0	34.0	7.5	18.0	18.0	25.5	55.2	55.2	5.3	35.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	18.2	19.4	19.4	7.3	8.3	8.3	20.8	58.4	58.4	5.4	36.5	
Actuated g/C Ratio	0.18	0.19	0.19	0.07	0.08	0.08	0.21	0.59	0.59	0.05	0.37	
v/c Ratio	0.75	0.11	0.80	0.50	0.17	0.14	0.78	0.18	0.08	0.17	0.63	
Control Delay	55.2	34.3	17.4	63.1	48.0	1.0	47.1	12.7	0.2	55.4	27.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	55.2	34.3	17.4	63.1	48.0	1.0	47.1	12.7	0.2	55.4	27.7	
LOS	E	C	B	E	D	A	D	B	A	E	C	
Approach Delay		29.3			40.9			30.7			28.2	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 99.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 30.0

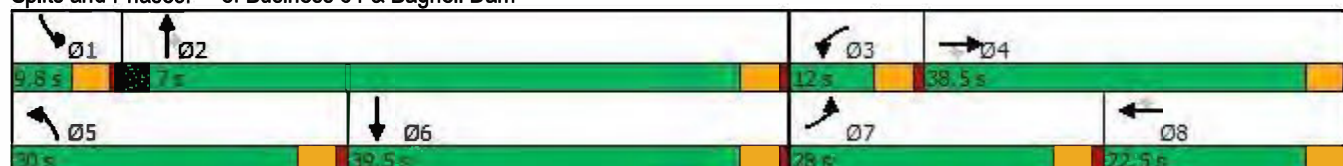
Intersection LOS: C

Intersection Capacity Utilization 68.3%

ICU Level of Service C

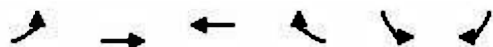
Analysis Period (min) 15

Splits and Phases: 8: Business 54 & Bagnell Dam



Lanes, Volumes, Timings
12: Bagnell Dam & Access P1

Alternative A
01/03/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	38	578	632	190	181	34
Future Volume (vph)	38	578	632	190	181	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			90	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.979	
Flt Protected	0.950				0.960	
Satd. Flow (prot)	1770	1863	1863	1583	1751	0
Flt Permitted	0.950				0.960	
Satd. Flow (perm)	1770	1863	1863	1583	1751	0
Link Speed (mph)		40	40		30	
Link Distance (ft)		436	211		292	
Travel Time (s)		7.4	3.6		6.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	628	687	207	197	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	628	687	207	234	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane		Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

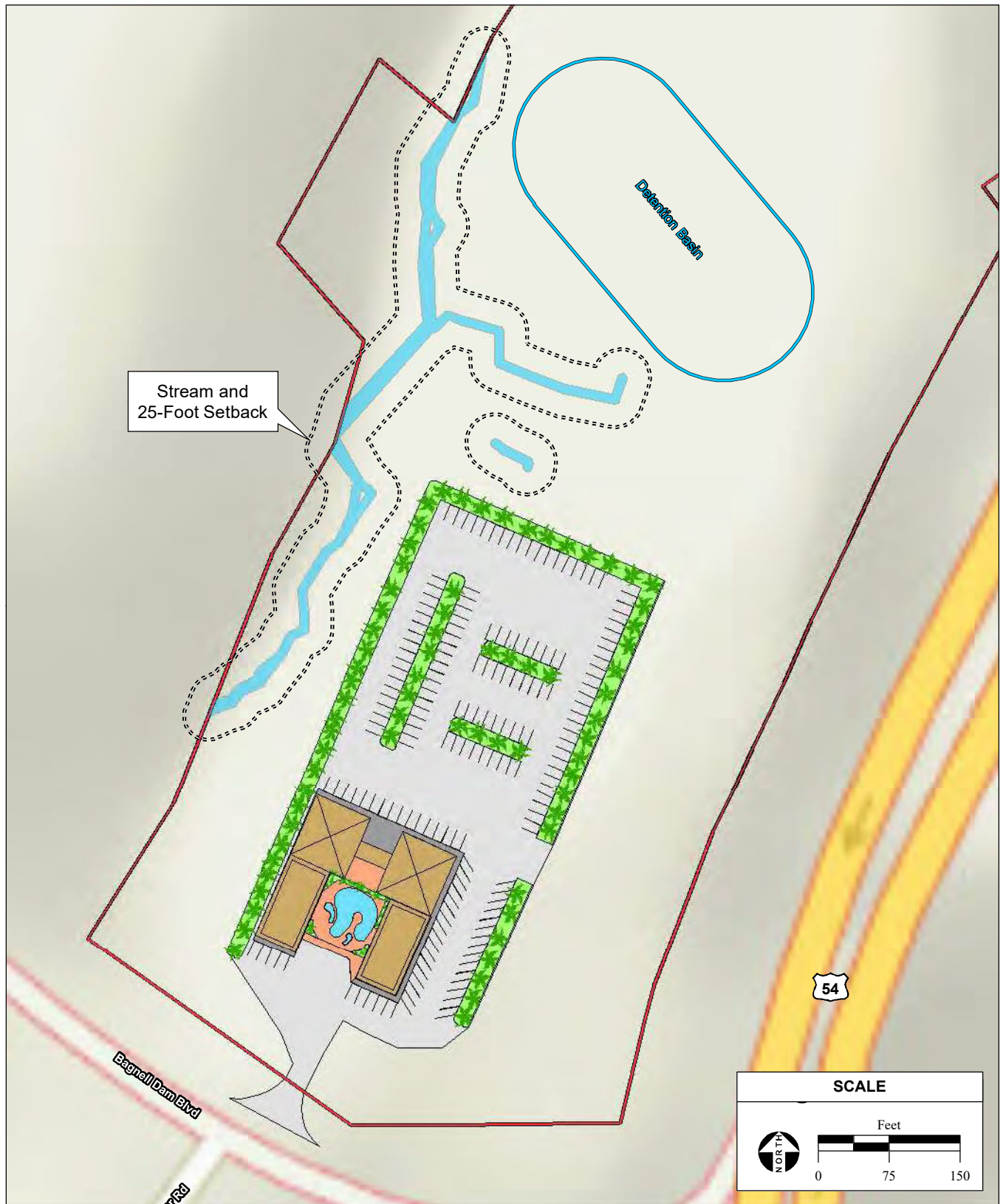
Intersection Capacity Utilization 52.0% ICU Level of Service A

Analysis Period (min) 15

APPENDIX III – ALTERNATIVE B

PREPARED BY:

CJW 



SOURCE: Miller County Parcels, 2021; Google Earth
ESRI, 2023; AES-Montrose, 8/1/2023

Osage Nation Lake of the Ozarks Casino Resort Project EA / 216514 ■

Figure 7
Alternative B - Site Plan

TRIP GENERATION - ALTERNATIVE B																	
LAND USE	ITE CODE*	Size	Variable	24-Hour	24-HOUR	24-Hour	24-HOUR	FRIDAY	FRI	FRI	WEEKDAY		SUNDAY	SUN	SUN	WEEKDAY	
				Weekday Trip Generation	WEEKDAY	Sunday Trip Generation	WEEKDAY	PEAK HOUR RATE	% IN	% OUT	FRI PEAK	ENTER	EXIT	PEAK HOUR RATE	% IN	% OUT	SUN PEAK
Full Development Hotel	310	100	Rooms	7.99	799	5.94	594	0.60	58%	42%	35	25	0.57	48%	52%	27	30
					799		594		TOTAL NEW TRIPS		35	25		TOTAL NEW TRIPS		27	30

Friday Peak Hour Calculations - Alternative B

N/S Street Osage Beach Pkwy
E/W Street Horseshoe Bend Pkwy
GrowthRate (GR) 2.00%
Years (n) 2

NewTrips
In 35
Out 25

Turn Movement	Existing Traffic	(1)	(2) Growth factor (1+GR) ⁿ	(1) x (2) Traffic Growth	NEW TRIPS				(1)x(2)+(3)x(4) Trips IN/OUT	A+B Projected Turn Movement for 2024
					(1)	(2)	(3)	(4)		
					Dist. (Exhibit 3)	IN	Dist. (Exhibit 3)	OUT		
NBL	105	1.04	1.04	109			5%	25	1	110 VEH/HR
NBR	372	1.04	1.04	387			70%	25	18	405 VEH/HR
SBL	1	1.04	1.04	1					0	1 VEH/HR
SBT	317	1.04	1.04	330	35%	35			12	342 VEH/HR
SBR	118	1.04	1.04	123					0	123 VEH/HR
EBT	300	1.04	1.04	312					2	102 VEH/HR
EBR	98	1.04	1.04	100	5%	35			12	115 VEH/HR
WBL	99	1.04	1.04	103	35%	35			0	304 VEH/HR
WBT	292	1.04	1.04	304						

Existing Traffic				Existing Traffic Projected to Construction Year				Site Traffic Assigned for Construction Year				Projected Full Buildout Traffic			
4,840	118	438	1	5,040	123	454	1	130	0	12	0	5,180	123	466	1
MO 54 Ramp				MO 54 Ramp				MO 54 Ramp				MO 54 Ramp			
10,120				10,530				330				10,570			
11,820				12,300								12,630			
116	300			648	312			0	0	0	0	951	312		304
292				100				12				107			1137
99				103								115			
Horseshoe Bend Pkwy				Horseshoe Bend Pkwy				Horseshoe Bend Pkwy				Horseshoe Bend Pkwy			
105	372			108	367			1	45	18		110	405		
Osage Beach Pkwy				Osage Beach Pkwy				Osage Beach Pkwy				Osage Beach Pkwy			
10,990				11,430				500				11,830			

N/S Street Osage Beach Pkwy
E/W Street Bagnell Dam Blvd
GrowthRate (GR) 2.00%
Years (n) 2

NewTrips
In 35
Out 25

Turn Movement	Existing Traffic	(1)	(2) Growth factor (1+GR) ⁿ	(1) x (2) Traffic Growth	NEW TRIPS				(1)x(2)+(3)x(4) Trips IN/OUT	A+B Projected Turn Movement for 2024
					(1)	(2)	(3)	(4)		
					Dist. (Exhibit 3)	IN	Dist. (Exhibit 3)	OUT		
NBL	534	1.04	1.04	556	10%	35			4	560 VEH/HR
NBT	364	1.04	1.04	379					0	379 VEH/HR
NBR	63	1.04	1.04	66					0	66 VEH/HR
SBL	28	1.04	1.04	29					0	29 VEH/HR
SBT	366	1.04	1.04	381					0	381 VEH/HR
SBR	149	1.04	1.04	155	75%	35	75%	25	28	181 VEH/HR
EBL	77	1.04	1.04	80					19	99 VEH/HR
EBT	31	1.04	1.04	32					0	32 VEH/HR
EBR	484	1.04	1.04	504			10%	25	3	507 VEH/HR
WBL	58	1.04	1.04	60					0	60 VEH/HR
WBT	40	1.04	1.04	42					0	42 VEH/HR
WBR	45	1.04	1.04	47					0	47 VEH/HR

Existing Traffic				Existing Traffic Projected to Construction Year				Site Traffic Assigned for Construction Year				Projected Full Buildout Traffic			
11,430	149	366	28	11,900	155	381	29	500	26	45	0	12,400	181	1116	29
Osage Beach Pkwy				Osage Beach Pkwy				Osage Beach Pkwy				Osage Beach Pkwy			
14,610				15,210				3,070				15,790			
2,940				3,070								3,070			
77				80				47				99			47
31				32				42				32			276
484				504				60				507			60
Bagnell Dam Blvd				Bagnell Dam Blvd				0				Bagnell Dam Blvd			0
534	364	63		556	379	66		4	0	0		560	379	66	
20,770				21,620				80				21,700			

N/S Street Access P1
E/W Street Bagnell Dam Blvd
Growth Rate (GR) 2.00%
Years (n) 2

NewTrips
In 35
Out 25

Turn Movement	Existing Traffic	(1)	(2) Growth factor (1+GR) ⁿ	(1) x (2) Traffic Growth	NEW TRIPS				(1)x(2)+(3)x(4) Trips IN/OUT	A+B Projected Turn Movement for 2024
					(1)	(2)	(3)	(4)		
					Dist. (Exhibit 3)	IN	Dist. (Exhibit 3)	OUT		
SBL	0	1.04	1.04	0			85%	25	22	22 VEH/HR
SBR	0	1.04	1.04	0			15%	25	4	4 VEH/HR
EBL	0	1.04	1.04	0	15%	35			5	5 VEH/HR
EBT	592	1.04	1.04	616					0	616 VEH/HR
WBT	723	1.04	1.04	753					0	753 VEH/HR
WBR	0	1.04	1.04	0	85%	35			30	30 VEH/HR

Existing Traffic				Existing Traffic Projected to Construction Year				Site Traffic Assigned for Construction Year				Projected Full Buildout Traffic			
0	0	0	0	0	0	0	0	680	4	61	22	680	4	61	22
Access P1				Access P1				Access P1				Access P1			
14,610				15,210				15,210				15,310			
0				0				580				30			1421
592				616				0				616			753
723				753				0				753			
Bagnell Dam Blvd				Bagnell Dam Blvd				Bagnell Dam Blvd				Bagnell Dam Blvd			

Sunday Peak Hour Calculations - Alternative B

[illegible][illegible][illegible]

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative B

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑		↑↑		↑	↑	↑	↑
Traffic Volume (vph)	0	312	102	115	304	0	110	0	405	1	342	123
Future Volume (vph)	0	312	102	115	304	0	110	0	405	1	342	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		340	190		0	0		280	335		330
Storage Lanes	0		1	1		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3539	1583	1770	3539	0	3433	0	1583	1770	1863	1583
Flt Permitted				0.502			0.950			0.950		
Satd. Flow (perm)	0	3539	1583	935	3539	0	3433	0	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171						440			162
Link Speed (mph)		45			30			45			45	
Link Distance (ft)		832			833			3100			561	
Travel Time (s)		12.6			18.9			47.0			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	339	111	125	330	0	120	0	440	1	372	134
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	339	111	125	330	0	120	0	440	1	372	134
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2		1		1	1	2	1
Detector Template		Thru	Right	Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (ft)		100	20	20	100		20		20	20	100	20
Trailing Detector (ft)		0	0	0	0		0		0	0	0	0
Detector 1 Position(ft)		0	0	0	0		0		0	0	0	0
Detector 1 Size(ft)		6	20	20	6		20		20	20	6	20
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		CI+Ex			CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	D.P+P	NA		Prot		Perm	Prot	NA	Perm
Protected Phases		6		5	2		3			7	4	
Permitted Phases			6	6					3			4

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative B

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		6	6	5	2		3		3	7	4	4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0		7.0		7.0	7.0	10.0	10.0
Minimum Split (s)		16.6	16.6	13.6	16.6		14.6		14.6	14.6	17.6	17.6
Total Split (s)		25.2	25.2	16.2	41.4		35.4		35.4	78.6	43.2	43.2
Total Split (%)		21.0%	21.0%	13.5%	34.5%		29.5%		29.5%	65.5%	36.0%	36.0%
Maximum Green (s)		18.6	18.6	9.6	34.8		27.8		27.8	71.0	35.6	35.6
Yellow Time (s)		4.8	4.8	4.8	4.8		5.5		5.5	5.5	5.5	5.5
All-Red Time (s)		1.8	1.8	1.8	1.8		2.1		2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6	6.6	6.6		7.6		7.6	7.6	7.6	7.6
Lead/Lag		Lag	Lag	Lead			Lead		Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes		Yes	Yes
Vehicle Extension (s)		3.5	3.5	2.5	3.5		2.5		2.5	2.5	4.0	4.0
Recall Mode		Min	Min	None	Min		None		None	None	None	None
Act Effect Green (s)		14.4	14.4	23.2	30.0		9.9		9.9	15.8	23.8	23.8
Actuated g/C Ratio		0.17	0.17	0.27	0.35		0.11		0.11	0.18	0.28	0.28
v/c Ratio		0.57	0.27	0.37	0.27		0.31		0.77	0.00	0.72	0.24
Control Delay		39.1	2.9	26.1	22.6		39.4		14.1	22.0	37.7	3.7
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		39.1	2.9	26.1	22.6		39.4		14.1	22.0	37.7	3.7
LOS		D	A	C	C		D		B	C	D	A
Approach Delay		30.2			23.6			19.5			28.7	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 86.2

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 25.2

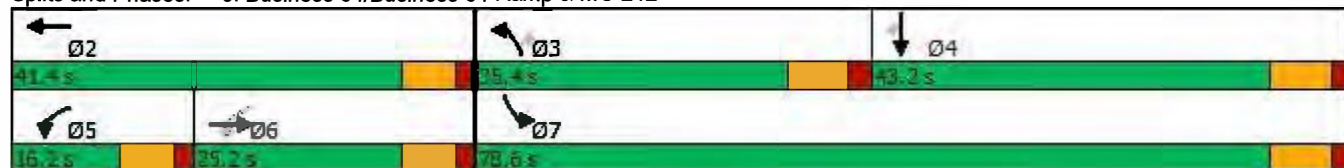
Intersection LOS: C

Intersection Capacity Utilization 57.7%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Business 54/Business 54 Ramp & MO 242



Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative B
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	32	507	60	42	47	560	379	66	29	381	181
Future Volume (vph)	99	32	507	60	42	47	560	379	66	29	381	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	75		95	820		0	150		0
Storage Lanes	1		1	1		1	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.952	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3369	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			528			177			136		63	
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		643			989			1559			3100	
Travel Time (s)		11.0			22.5			23.6			47.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	108	35	551	65	46	51	609	412	72	32	414	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	35	551	65	46	51	609	412	72	32	611	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative B
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	19.4	39.0	39.0	14.0	33.6	33.6	33.0	56.0	56.0	11.0	34.0	
Total Split (%)	16.2%	32.5%	32.5%	11.7%	28.0%	28.0%	27.5%	46.7%	46.7%	9.2%	28.3%	
Maximum Green (s)	14.9	34.5	34.5	9.5	29.1	29.1	28.5	51.5	51.5	6.5	29.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	10.8	12.2	12.2	8.2	10.0	10.0	20.6	53.3	53.3	6.4	33.9	
Actuated g/C Ratio	0.12	0.13	0.13	0.09	0.11	0.11	0.23	0.59	0.59	0.07	0.37	
v/c Ratio	0.51	0.14	0.82	0.41	0.23	0.15	0.78	0.20	0.07	0.26	0.47	
Control Delay	50.3	37.1	15.6	52.0	42.0	1.0	41.9	12.3	0.1	51.7	24.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	50.3	37.1	15.6	52.0	42.0	1.0	41.9	12.3	0.1	51.7	24.1	
LOS	D	D	B	D	D	A	D	B	A	D	C	
Approach Delay		22.1			33.1			28.0			25.4	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 90.8

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 26.1

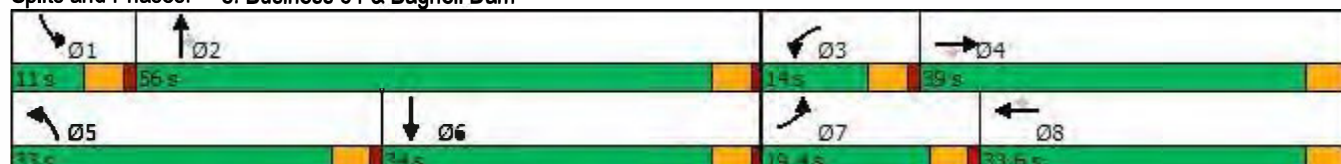
Intersection LOS: C

Intersection Capacity Utilization 63.1%

ICU Level of Service B

Analysis Period (min) 15

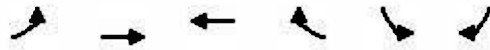
Splits and Phases: 8: Business 54 & Bagnell Dam



Lanes, Volumes, Timings
12: Bagnell Dam & Access P1

Alternative B

01/03/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	616	753	30	22	4
Future Volume (vph)	5	616	753	30	22	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.981	
Flt Protected	0.950				0.959	
Satd. Flow (prot)	1770	1863	1853	0	1752	0
Flt Permitted	0.950				0.959	
Satd. Flow (perm)	1770	1863	1853	0	1752	0
Link Speed (mph)		40	40		30	
Link Distance (ft)		436	103		292	
Travel Time (s)		7.4	1.8		6.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	670	818	33	24	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	670	851	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane		Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 51.4% ICU Level of Service A

Analysis Period (min) 15

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative B

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑		↖		↗	↖	↑	↗
Traffic Volume (vph)	0	390	157	90	201	0	83	0	360	1	311	68
Future Volume (vph)	0	390	157	90	201	0	83	0	360	1	311	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		340	190		0	0		280	335		330
Storage Lanes	0		1	1		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3539	1583	1770	3539	0	3433	0	1583	1770	1863	1583
Flt Permitted				0.423			0.950			0.950		
Satd. Flow (perm)	0	3539	1583	788	3539	0	3433	0	1583	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171						391			162
Link Speed (mph)		45			30			45			45	
Link Distance (ft)		832			833			3100			561	
Travel Time (s)		12.6			18.9			47.0			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	424	171	98	218	0	90	0	391	1	338	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	424	171	98	218	0	90	0	391	1	338	74
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2		1		1	1	2	1
Detector Template		Thru	Right	Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (ft)		100	20	20	100		20		20	20	100	20
Trailing Detector (ft)		0	0	0	0		0		0	0	0	0
Detector 1 Position(ft)		0	0	0	0		0		0	0	0	0
Detector 1 Size(ft)		6	20	20	6		20		20	20	6	20
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		CI+Ex			CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	D.P+P	NA		Prot		Perm	Prot	NA	Perm
Protected Phases		6		5	2		3			7	4	
Permitted Phases			6	6					3			4

Lanes, Volumes, Timings
3: Business 54/Business 54 Ramp & MO 242

Alternative B

01/03/2024

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		6	6	5	2		3		3	7	4	4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0		7.0		7.0	7.0	10.0	10.0
Minimum Split (s)		16.6	16.6	13.6	16.6		14.6		14.6	14.6	17.6	17.6
Total Split (s)		30.0	30.0	15.4	45.4		33.6		33.6	74.6	41.0	41.0
Total Split (%)		25.0%	25.0%	12.8%	37.8%		28.0%		28.0%	62.2%	34.2%	34.2%
Maximum Green (s)		23.4	23.4	8.8	38.8		26.0		26.0	67.0	33.4	33.4
Yellow Time (s)		4.8	4.8	4.8	4.8		5.5		5.5	5.5	5.5	5.5
All-Red Time (s)		1.8	1.8	1.8	1.8		2.1		2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.6	6.6	6.6	6.6		7.6		7.6	7.6	7.6	7.6
Lead/Lag		Lag	Lag	Lead			Lead		Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes		Yes	Yes
Vehicle Extension (s)		3.5	3.5	2.5	3.5		2.5		2.5	2.5	4.0	4.0
Recall Mode		Min	Min	None	Min		None		None	None	None	None
Act Effect Green (s)		17.4	17.4	23.5	28.5		9.6		9.6	15.2	22.4	22.4
Actuated g/C Ratio		0.21	0.21	0.28	0.34		0.11		0.11	0.18	0.27	0.27
v/c Ratio		0.58	0.37	0.31	0.18		0.23		0.74	0.00	0.68	0.14
Control Delay		35.5	8.2	23.5	20.5		39.6		13.9	23.0	36.8	0.5
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		35.5	8.2	23.5	20.5		39.6		13.9	23.0	36.8	0.5
LOS		D	A	C	C		D		B	C	D	A
Approach Delay		27.6			21.4			18.7			30.3	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 83.6

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 24.8

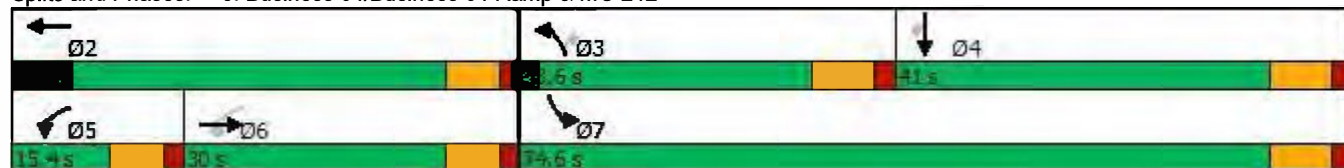
Intersection LOS: C

Intersection Capacity Utilization 57.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Business 54/Business 54 Ramp & MO 242



Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative B

01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	36	482	59	24	37	499	343	70	15	463	132
Future Volume (vph)	87	36	482	59	24	37	499	343	70	15	463	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	75		95	820		0	150		0
Storage Lanes	1		1	1		1	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3422	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3422	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			481			136			95		30	
Link Speed (mph)		40			30			45			45	
Link Distance (ft)		668			989			1559			3100	
Travel Time (s)		11.4			22.5			23.6			47.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	39	524	64	26	40	542	373	76	16	503	143
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	39	524	64	26	40	542	373	76	16	646	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Lanes, Volumes, Timings
8: Business 54 & Bagnell Dam

Alternative B
01/03/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	17.6	39.0	39.0	14.0	35.4	35.4	31.0	57.1	57.1	9.9	36.0	
Total Split (%)	14.7%	32.5%	32.5%	11.7%	29.5%	29.5%	25.8%	47.6%	47.6%	8.3%	30.0%	
Maximum Green (s)	13.1	34.5	34.5	9.5	30.9	30.9	26.5	52.6	52.6	5.4	31.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	10.0	12.3	12.3	8.2	10.7	10.7	18.9	54.8	54.8	5.6	34.5	
Actuated g/C Ratio	0.11	0.14	0.14	0.09	0.12	0.12	0.21	0.61	0.61	0.06	0.38	
v/c Ratio	0.48	0.15	0.83	0.40	0.12	0.13	0.75	0.17	0.08	0.15	0.48	
Control Delay	50.2	36.3	17.7	51.2	38.1	0.9	41.6	11.1	2.4	50.5	24.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	50.2	36.3	17.7	51.2	38.1	0.9	41.6	11.1	2.4	50.5	24.9	
LOS	D	D	B	D	D	A	D	B	A	D	C	
Approach Delay		23.5			33.1			27.1			25.6	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 89.8

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 26.0

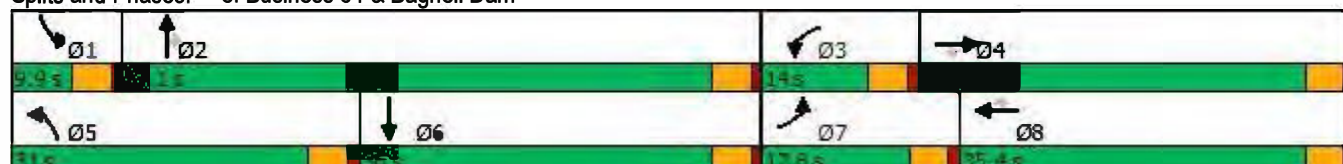
Intersection LOS: C

Intersection Capacity Utilization 62.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: Business 54 & Bagnell Dam



Lanes, Volumes, Timings
12: Bagnell Dam & Access P1

Alternative B
01/03/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	578	632	23	27	5
Future Volume (vph)	4	578	632	23	27	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.980	
Flt Protected	0.950				0.959	
Satd. Flow (prot)	1770	1863	1853	0	1751	0
Flt Permitted	0.950				0.959	
Satd. Flow (perm)	1770	1863	1853	0	1751	0
Link Speed (mph)		40	40		30	
Link Distance (ft)		436	78		292	
Travel Time (s)		7.4	1.3		6.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	628	687	25	29	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	628	712	0	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane		Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 44.7% ICU Level of Service A

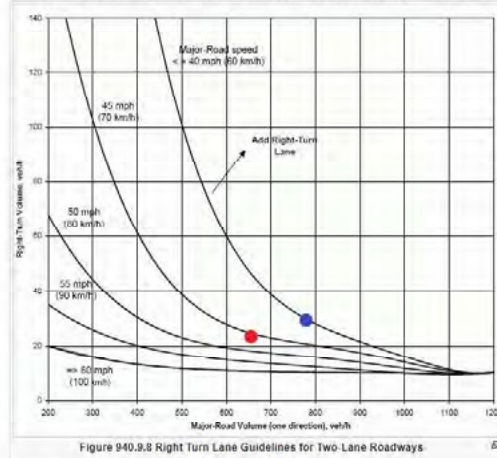
Analysis Period (min) 15

2024 Turn Lane Warrants:

Access P1 & Bagnell Dam Boulevard:

940.9.8 Right Turn Lane Guidelines for Two-Lane Roadways, Access P1 & Bagnell Dam Boulevard, Westbound Right

Legend:
● - Friday Peak
● - Sunday Peak



The following data are required:

1. Advancing Volume (veh/hr) - The advancing volume is to include the right-turn, left-turn and through movements in the same direction as the right turning vehicle. **783 veh/hr**
2. Right Turning Volume (veh/hr) - The right turning volume is the number of advancing vehicles turning right. **30 veh/hr**
3. Operating Speed (mph) - The greatest or anticipated operating speed, measured 85th percentile speed or posted speed. **40 MPH**

Note: Right turn lane is not needed for right turn volume less than 10 vph. However, criteria other than volume, e.g. crash experience, may be used to justify a right turn lane.

If the combination of major road approach volume and right-turn volume intersects above or to the right of the speed trend line corresponding the major road operating speed, then a right-turn lane is appropriate.