

June 18, 2024

DRMP Job #:21024

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Subject: Phasing Study for Off-Site Improvements
Brio Development - Knightdale

Dear Mr. Boulware:

This letter provides a summary of the phasing study for off-site transportation improvements required of the Brio development located south of Buffaloe Road in Knightdale. A Traffic Impact Analysis (TIA) for this development (named Buffaloe Road Assemblage) was prepared in May 2021. This TIA was reviewed by NCDOT and required transportation improvements were identified in the June 16, 2021 letter (see attached). These improvements are requested to be phased along with the build out of the development.

This phasing study considers intersections that have required transportation improvements. The original TIA for the Brio development included other intersections, but the intersections without required roadway improvements were not analyzed in this phasing study. Improvements at any Site Driveway intersections are assumed to be constructed when the driveway is constructed and open to traffic.

The following phases for the Brio development were analyzed in this phasing study:

- Brio East (Phase 1): 288 units total (138 single-family homes, 150 townhomes)
- Brio 55 (Phase 2): 300 age-restricted homes
- Brio 55 (Phase 3): 200 age-restricted homes, 112 age-restricted apartments, 30,000 s.f. retail

The build out number of units for each phase considers the homes to be built, received a Certificate of Occupancy and are occupied to generate traffic.

Existing Traffic Volumes

Existing peak hour traffic volumes from the previously submitted TIA were used for this phasing study and any updated traffic counts from more recent traffic studies were utilized for intersections, where available. The most recent traffic study in the area was prepared for the Buffalo Road Multi-use Development by Kimley-Horn (KHA) and dated April 20, 2023. Traffic volumes at the intersections on Buffalo Road at the I-540 ramps and Forestville Road were utilized from this study since the data is more recent. In comparing the more recent traffic volumes from the KHA study to the traffic volumes used in the Brio TIA report, the traffic volumes appear to be similar; therefore, no growth rate or balancing was necessary to the original Brio TIA existing traffic volumes. The existing traffic volumes used for this phasing study are shown in Figure 1 attached.

No-Build Traffic Volumes

No-build traffic volumes were calculated by growing the existing peak hour traffic volumes to the build out year 2028 using an annual growth rate of 1.5%, which was used in the most recent TIA report in the area (Buffalo Road Multi-Use Development by KHA).

Several adjacent developments are approved and/or moving forward at the time of this phasing study. Adjacent development traffic volumes were taken from the most recent TIA completed by KHA. A list of the developments included in this phasing study are summarized below. Refer to the attached table for the trip assignment of each adjacent development at the study intersections.

Adjacent developments included in this phasing study are as follows:

- Buffalo Shoals
- Forestville-Needham
- River Towne (Phase 1)
- Buffalo Road Multi-Use
- Buffalo Bend
- Buffalo Road Residential
- Old Milburnie Residential

This phasing study includes trips from each of the adjacent developments, which is for full build out of the development with the exception of River Towne. Based on anticipated schedules, River Towne is not expected to complete a construction phase beyond Phase 1 by the build out of the Brio development. It is likely that some of other developments will not be built out by the analysis year for the phases of the Brio Development; therefore, the no-build traffic volumes in this phasing study represent a worst-case scenario for future traffic volumes at the study intersections.



Site Trip Generation

Average weekday daily, AM peak hour, and PM peak hour trips for each development phase were estimated using methodology contained within the ITE *Trip Generation Manual*, 11th Edition. Table 1 provides a summary of the trip generation potential for the phases of development.

Brio 55 will include 500 age-restricted units that will include a mix of single-family homes and multi-family homes. For the purposes of trip generation, all of these units are considered as adult single-family homes. Brio 55 also includes a commercial area located at the main entrance on Buffalo Road that is assumed to include 30,000 square feet (s.f.) of retail space plus 112 age-restricted apartments. Internal capture trips were calculated for the Brio 55 area based on the NCHRP methodology. Phase 2 of the Brio development will include 300 age-restricted homes within the Brio 55 area. Phase 3 trip generation includes these units from Phase 2.

Table 1: Trip Generation Summary – Brio East and Brio 55

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Brio East (Phase 1)						
Single-Family Homes (210)	138 units	1,357	25	75	85	50
Townhomes (215)	150 units	1,093	18	54	51	35
Total (Phase 1)	288 units	2,450	43	129	136	85
Brio 55 (Phase 2)						
Adult/Senior Single-Family Homes (251)	300 units	1,508	30	60	64	40
Brio 55 (Phase 2 + Phase 3)						
Adult/Senior Single-Family Homes (251)	500 units	2,327	44	88	95	61
Age Restricted Multi-Family (252)	112 units	349	8	14	16	12
Commercial / Shopping Center (822)	30,000 sf	1,496	36	23	85	85
Total (Phase 2 + Phase 3)		4,172	88	125	196	158
Internal Capture (AM 2%,1%) (PM 4%, 5%)		--	-2	-1	-8	-8
Total Primary (New) Trips		4,172	86	124	188	150



Brio East will be Phase 1 of the development, which will generate approximately 2,450 daily site trips, 172 weekday AM peak hour trips (43 entering and 129 exiting), and 221 weekday PM peak hour trips (136 entering and 85 exiting).

Brio 55 (Phase 2 + Phase 3) of the development, which will generate approximately 4,172 daily site trips, 210 weekday AM peak hour trips (86 entering and 124 exiting), and 338 weekday PM peak hour trips (188 entering and 150 exiting). In the PM peak hour, approximately 50% of the peak hour trips are generated by the commercial/retail use.

Trip generation used in the original TIA report for the development was significantly higher than the total trip generation for the current development plan. The original TIA report included trip generation for more residential density than will be constructed in the development. Table 2 provides a comparison of the trip generation for the current approved plan for the Brio development and the trip generation used in the TIA report.

Table 2: Trip Generation Comparison – Brio Current vs. TIA

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Brio East and Brio 55 (Full Build Out)						
Total Trips		6,622	129	253	324	235
Original Development TIA (Buffaloe Assemblage, Alternative 1)						
Total Trips (Alternative 1)		9,450	162	467	486	290
DIFFERENCE		-2,828	-33	-214	-162	-55

As shown in Table 2, the current development plan will generate over 2,800 fewer daily trips, approximately 250 fewer AM peak hour trips, and over 200 fewer PM peak hour trips than was assumed in the original TIA report. All improvements required for the development (in the NCDOT June 16, 2021 letter) were based on the higher trip generation in the TIA report. The overall impact of development trips will be much less than assumed in the original TIA report.



Site Trip Distribution

Overall regional site trip distribution percentages were taken from the previous TIA report prepared for this development. Some adjustments were made at driveway intersections based on the current site plan. Vehicle access will not be provided between Brio East and Brio 55; therefore, separate distribution percentages were used for each phase/section of the development. Trip distribution and site trips for Brio East and Brio 55 are shown in the attached figures.

Capacity Analysis

Study intersections were analyzed for the below scenarios.

- No-Build (2028) Conditions with Adjacent Developments (Phase 1 of River Towne)
- Build with Brio Phase 1 (Brio East), Adjacent Developments (Without River Towne)
- Build with Brio Phase 1 (Brio East), Adjacent Developments (Phase 1 of River Towne)
- Build with Brio Phase 1+2, Adjacent Developments (Without River Towne)
- Build with Brio Phase 1+2, Adjacent Developments (Phase 1 of River Towne)
- Build with Brio Phase 1+2+3 (Full Build), Adjacent Developments (Phase 1 of River Towne)

River Towne and Brio contribute a higher percentage of traffic to the study intersections on Buffalo Road at Old Milburnie Road and at Old Crews Road. River Towne is not currently on the same build out schedule as the Brio development and may not be complete with Phase 1 prior to completion of the Brio development or early phases of Brio; therefore, this study includes scenarios with no River Towne trips and with only Phase 1 River Towne trips.

Capacity analysis at all study intersections was completed according to the NCDOT Congestion Management Guidelines.

Buffaloe Road and I-540 Eastbound/Southbound Ramps

The intersection of Buffalo Road and I-540 Eastbound Ramps was analyzed without improvements under each analysis scenario to consider potential operations in the near future until improvements are completed. Multiple developments are required to construct improvements at this intersection, and some improvements will require additional right-of-way and/or widening along Buffalo Road east of the ramps.

As shown in the table, the Brio phase of development does not have a significant impact on the intersection when compared to no-build conditions. With the addition of full build of Brio (including the Brio 55 phase), intersection delay increases more during the PM peak hour, particularly when River Towne Phase 1 trips are included.

Table 3: Analysis Summary of Buffalo Road and I-540 EB/SB Ramps

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATION	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (sec)	Approach	Overall (sec)
No-Build (2028) Conditions	EB WB SB	1 TH, 1 RT 1 LT, 1 TH 1 LT-TH, 1 RT	C C D	C (31)	F (89) F (88) F (233)	F (148)
Build w/ Brio Ph 1 (Brio East) (2028) No River Towne	EB WB SB	1 TH, 1 RT 1 LT, 1 TH 1 LT-TH, 1 RT	C C D	C (29)	F (89) E F (222)	F (139)
Build w/ Brio Ph 1 (Brio East) (2028) Ph 1 River Towne	EB WB SB	1 TH, 1 RT 1 LT, 1 TH 1 LT-TH, 1 RT	D C D	D (39)	F (96) F (90) F (263)	F (164)
Build w/ Brio Ph 2 (Brio 55) (2028) No River Towne	EB WB SB	1 TH, 1 RT 1 LT, 1 TH 1 LT-TH, 1 RT	C C D	C (30)	F (91) E F (236)	F (145)
Build w/ Brio Ph 2 (Brio 55) (2028) Ph 1 River Towne	EB WB SB	1 TH, 1 RT 1 LT, 1 TH 1 LT-TH, 1 RT	D C D	D (39)	F (104) F (91) F (277)	F (172)
Build w/ Brio Ph 3 Full Build Out (2028) Ph 1 River Towne	EB WB SB	1 TH, 1 RT 1 LT, 1 TH 1 LT-TH, 1 RT	D D D	D (42)	F (119) F (94) F (306)	F (189)

Significant improvements to the bridge and interchange ramps are required of multiple developments and are anticipated to be completed in the future. The Brio development is anticipated to participate in the completion of improvements at this intersection.

Buffaloe Road and I-540 Westbound/Northbound Ramps

The intersection of Buffaloe Road and I-540 Westbound Ramps was analyzed without improvements under each analysis scenario to consider potential operations in the near future until improvements are completed. Multiple developments are required to construct improvements at this intersection, and some improvements will require additional right-of-way and/or widening along Buffaloe Road.

Table 4: Analysis Summary of Buffaloe Road and I-540 Westbound Ramps

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATION	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (sec)	Approach	Overall (sec)
No-Build (2028) Conditions	EB WB NB	1 LT, 1 TH 1 TH, 1 RT 1 LT-TH, 1 RT	B D C	C (31)	F (115) B F (327)	F (116)
Build w/ Brio Ph 1 (Brio East) (2028) No River Towne	EB WB NB	1 LT, 1 TH 1 TH, 1 RT 1 LT-TH, 1 RT	B C C	C (29)	F (111) B F (288)	F (106)
Build w/ Brio Ph 1 (Brio East) (2028) Ph 1 River Towne	EB WB NB	1 LT, 1 TH 1 TH, 1 RT 1 LT-TH, 1 RT	B E C	D (45)	F (142) B F (336)	F (130)
Build w/ Brio Ph 2 (Brio 55) (2028) No River Towne	EB WB NB	1 LT, 1 TH 1 TH, 1 RT 1 LT-TH, 1 RT	B D C	C (32)	F (124) B F (291)	F (112)
Build w/ Brio Ph 2 (Brio 55) (2028) Ph 1 River Towne	EB WB NB	1 LT, 1 TH 1 TH, 1 RT 1 LT-TH, 1 RT	B E C	D (50)	F (155) B F (340)	F (136)
Build w/ Brio Ph 3 Full Build Out (2028) Ph 1 River Towne	EB WB NB	1 LT, 1 TH 1 TH, 1 RT 1 LT-TH, 1 RT	B E C	E (56)	F (181) C F (348)	F (149)

Similar to the I-540 Eastbound ramp intersection, the early phases of the Brio development does not have a significant impact on the intersection when compared to no-build conditions. With full build of Brio (including the Brio 55 phase), the intersection delay increases, particularly when River Towne Phase 1 trips are included. Significant improvements to the bridge and interchange ramps are required of multiple developments, which include a second eastbound through lane. Although several movements experience poor operations and will continue to operate poorly in the future, early phases of Brio do not have a significant impact on the intersection. Since improvements are required to be done in the future, and other developments are moving forward in the area, no improvements are considered as part of the early phases of the Brio development (prior to Phase 3).

Buffaloe Road and Forestville Road

The signalized intersection of Buffaloe Road and Forestville Road was analyzed without significant road improvements; however, several developments are anticipated to move forward in the near future and construct improvements at this intersection.

Table 5: Analysis Summary of Buffaloe Road and Forestville Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATION	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (sec)	Approach	Overall (sec)
No-Build (2028) Conditions	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	B F (157) F (118) F (148)	F (115)	E F (161) D C	E (76)
Build w/ Brio Ph 1 (Brio East) (2028) No River Towne	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	C F (137) F (119) F (148)	F (108)	D F (138) D C	E (66)
Build w/ Brio Ph 1 (Brio East) (2028) Ph 1 River Towne	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	B F (389) F (210) D	F (182)	F (83) F (193) D D	F (95)
Build w/ Brio Ph 2 (Brio 55) (2028) No River Towne	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	C F (157) F (119) F (148)	F (115)	E F (152) D C	E (74)
Build w/ Brio Ph 2 (Brio 55) (2028) Ph 1 River Towne	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	B F (418) F (210) D	F (195)	F (94) F (209) D D	F (104)
Build w/ Brio Ph 3 Full Build Out (2028) Ph 1 River Towne	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	B F (451) F (210) D	F (207)	F (116) F (258) D D	F (128)

Capacity analysis of all scenarios indicates the intersection will operate at poor levels of service without additional improvements. Some adjacent developments are currently moving forward and additional improvements will be made at/near the intersection as other turn lane improvements and frontage widening is completed. Intersection delay should decrease as these improvements are constructed in the near future by developments. Since the early phases of the Brio development do not have a significant impact on the intersection, improvements required by Brio should be considered during Phase 3 of the Brio development.

Buffaloe Road and Old Milburnie Road

The intersection of Buffaloe Road and Old Milburnie Road was analyzed under all scenarios with an exclusive southbound right turn lane on Old Milburnie Road that is planned for construction by the Old Milburnie Residential development. This improvement was also required of the Brio and River Towne developments. The other improvement identified for the Brio development is an eastbound right turn lane on Buffaloe Road that would be the terminus of the second eastbound through lane from the I-540 ramps. This improvement was constructed by the Bryson Village residential development as part of their frontage widening.

Table 6: Analysis Summary of Buffaloe Road and Old Milburnie Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATION	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (sec)	Approach	Overall (sec)
No-Build (2028) Conditions	EB	1 LT, 1 TH, 1 RT	B	C (23)	B	C (20)
	WB	1 LT, 1 TH-RT	C			
	NB	1 LT-TH-RT	C			
	SB	1 LT-TH, 1 RT	C			
Build w/ Brio Ph 1 (Brio East) (2028) No River Towne	EB	1 LT, 1 TH, 1 RT	B	C (21)	B	B (19)
	WB	1 LT, 1 TH-RT	C			
	NB	1 LT-TH-RT	C			
	SB	1 LT-TH, 1 RT	B			
Build w/ Brio Ph 1 (Brio East) (2028) Ph 1 River Towne	EB	1 LT, 1 TH, 1 RT	B	C (26)	B	C (22)
	WB	1 LT, 1 TH-RT	C			
	NB	1 LT-TH-RT	D			
	SB	1 LT-TH, 1 RT	C			
Build w/ Brio Ph 2 (Brio 55) (2028) No River Towne	EB	1 LT, 1 TH, 1 RT	B	C (22)	B	B (20)
	WB	1 LT, 1 TH-RT	C			
	NB	1 LT-TH-RT	C			
	SB	1 LT-TH, 1 RT	C			
Build w/ Brio Ph 2 (Brio 55) (2028) Ph 1 River Towne	EB	1 LT, 1 TH, 1 RT	B	C (27)	B	C (23)
	WB	1 LT, 1 TH-RT	C			
	NB	1 LT-TH-RT	D			
	SB	1 LT-TH, 1 RT	C			
Build w/ Brio Ph 3 Full Build Out (2028) Ph 1 River Towne	EB	1 LT, 1 TH, 1 RT	B	C (28)	C	C (26)
	WB	1 LT, 1 TH-RT	C			
	NB	1 LT-TH-RT	D			
	SB	1 LT-TH, 1 RT	C			

Improvements are shown in **bold**.

Based on the capacity analysis results, no additional improvements would be necessary at this intersection other than the southbound right turn lane planned by the Old Milburnie Residential development.

Buffaloe Road and Old Crews Road

Buffaloe Road and Old Crews Road is currently a four-way stop-controlled intersection and was analyzed with this traffic control through the early phases of the Brio development. In the future, Brio is required to install a traffic signal at the intersection if warranted along with constructing an eastbound right turn lane on Buffaloe Road. River Towne is required to construct a westbound left turn lane and eastbound left turn lane on Buffaloe Road in addition to the previously mentioned improvements. Phase 2 of River Towne is required to install the left turn lanes on Buffaloe Road as well as install the traffic signal if warranted.

Table 7: Analysis Summary of Buffaloe Road and Old Crews Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATION	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (sec)	Approach	Overall (sec)
No-Build (2028) Conditions	EB	1 LT-TH-RT	B ¹	D (27)	F ¹	F (51)
	WB	1 LT-TH-RT	E ¹		C ¹	
	NB	1 LT-TH-RT	B ¹		B ¹	
	SB	1 LT-TH-RT	B ¹		B ¹	
Build w/ Brio Ph 1 (Brio East) (2028) No River Towne	EB	1 LT-TH-RT	B ¹	C (16)	E ¹	D (30)
	WB	1 LT-TH-RT	C ¹		C ¹	
	NB	1 LT-TH-RT	B ¹		B ¹	
	SB	1 LT-TH-RT	B ¹		B ¹	
Build w/ Brio Ph 1 (Brio East) (2028) Ph 1 River Towne	EB	1 LT-TH-RT	C ¹	E (40)	F ¹ (162)	F (95)
	WB	1 LT-TH-RT	F ¹		D ¹	
	NB	1 LT-TH-RT	B ¹		B ¹	
	SB	1 LT-TH-RT	B ¹		B ¹	
Build w/ Brio Ph 2 (Brio 55) (2028) No River Towne	EB	1 LT-TH-RT	B ¹	C (19)	F ¹ (65)	E (41)
	WB	1 LT-TH-RT	D ¹		C ¹	
	NB	1 LT-TH-RT	B ¹		B ¹	
	SB	1 LT-TH-RT	B ¹		B ¹	
Build w/ Brio Ph 2 (Brio 55) (2028) Ph 1 River Towne	EB	1 LT-TH-RT	C ¹	F (52)	F ¹ (202)	F (118)
	WB	1 LT-TH-RT	F ¹ (86)		D ¹	
	NB	1 LT-TH-RT	B ¹		C ¹	
	SB	1 LT-TH-RT	B ¹		B ¹	
Build w/ Brio Ph 3 Full Build Out (2028) Signalized Ph 1 River Towne	EB	1 LT-TH, 1 RT	A	B (14)	B	B (18)
	WB	1 LT-TH-RT	B		A	
	NB	1 LT-TH-RT	C		D	
	SB	1 LT-TH-RT	C		C	

1. Level of service for all-way stop approach. Improvements are shown in **bold**.

Capacity analysis indicates the intersection will continue to operate at an acceptable level of service with four-way stop-control if Phase 1 of River Towne is not completed. During the Brio 55 phase of



development, the eastbound right turn lane and signal are assumed to be installed. With the signal and eastbound right turn lane, the intersection operates at LOS B. If Phase 1 of River Towne is not completed prior to Brio 55, it is possible that the intersection could continue to operate with stop-control longer.

Smithfield Road / Horton Road and Forestville Road

This intersection was analyzed with traffic signal control. Improvements identified for the Brio development include an extension of the northbound left turn lane on Smithfield Road and potentially an eastbound right turn lane on Forestville Road.

Table 8: Analysis Summary of Smithfield Rd/Horton Rd and Old Milburnie Rd

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATION	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (sec)	Approach	Overall (sec)
No-Build (2028) Conditions	EB	1 LT, 1 TH-RT	E	C (34)	E	C (33)
	WB	1 LT, 1 TH, 1 RT	D		D	
	NB	1 LT, 1 TH-RT	B		B	
	SB	1 LT, 1 TH-RT	B		B	
Build w/ Brio Ph 1 (Brio East) (2028) No River Towne	EB	1 LT, 1 TH-RT	E	D (35)	E	C (33)
	WB	1 LT, 1 TH, 1 RT	D		D	
	NB	1 LT, 1 TH-RT	B		B	
	SB	1 LT, 1 TH-RT	B		B	
Build w/ Brio Ph 1 (Brio East) (2028) Ph 1 River Towne	EB	1 LT, 1 TH-RT	E	C (35)	E	C (33)
	WB	1 LT, 1 TH, 1 RT	D		D	
	NB	1 LT, 1 TH-RT	B		B	
	SB	1 LT, 1 TH-RT	B		B	
Build w/ Brio Ph 2 (Brio 55) (2028) No River Towne	EB	1 LT, 1 TH-RT	E	C (35)	E	C (32)
	WB	1 LT, 1 TH, 1 RT	D		D	
	NB	1 LT, 1 TH-RT	B		B	
	SB	1 LT, 1 TH-RT	B		B	
Build w/ Brio Ph 2 (Brio 55) (2028) Ph 1 River Towne	EB	1 LT, 1 TH-RT	E	C (35)	E	C (32)
	WB	1 LT, 1 TH, 1 RT	D		D	
	NB	1 LT, 1 TH-RT	B		B	
	SB	1 LT, 1 TH-RT	B		B	
Build w/ Brio Ph 3 Full Build Out (2028) Ph 1 River Towne	EB	1 LT, 1 TH-RT	D	C (32)	E	C (31)
	WB	1 LT, 1 TH, 1 RT	D		D	
	NB	1 LT, 1 TH-RT	B		B	
	SB	1 LT, 1 TH-RT	C		B	

The northbound left turn lane currently has a storage of approximately 225 feet. The longest 95th percentile queue in the analysis scenarios was approximately 245 feet for the northbound left turn movement. With some minor signal adjustments, analysis shows the intersection will operate at LOS



C with northbound left turn queues that would be accommodated by the existing left turn lane. Based on the analysis results, no improvements would be necessary as part of the Brio development.

Summary

This phasing study was prepared to identify improvements to be constructed as part of the Brio development (Brio + Brio 55). Based on the final plans, the total Brio development is expected to generate fewer peak hour trips than assumed in the previous TIA report for the same development. The reduction in trips results in a lower impact on the study intersections.

This study includes trips from several adjacent developments that are located near the I-540 interchange and the Forestville Road intersection. Some of these developments are moving forward and will be making improvements such as frontage widening, right-of-way dedication, and turn lanes. With these developments moving forward, the early phases of the Brio development should not design or construct improvements in these areas while these adjacent developments are being constructed.

Several developments, including Brio, are required to make improvements at the I-540 interchange ramps and to the Forestville Road intersection. Based on the results of this phasing study, the Brio phase of development has a negligible impact on the study intersections. It is recommended that these improvements be evaluated, planned, and designed during the Brio 55 phase of development with no improvements required for the initial phases of the Brio development. As the Brio 55 phase is building out, more developments will likely be moving forward and coordination can occur between developments to design and construct the improvements.

Refer to the following recommendations for each phase of the development. Several improvements identified do not have adequate right-of-way to construct the widening. Several other developments are in various stages of approvals or completions, which could change the transportation infrastructure and traffic patterns in the future. It is anticipated that some of these improvements will not be constructable in the future or other developments will construct these or other improvements that could mitigate traffic impacts.

Roadway Improvements Required of Brio

Buffaloe Road and I-540 Eastbound Ramps

- Construct an exclusive southbound left-turn lane along the I-540 Eastbound Off-Ramp with 700 feet to 1,000 feet of storage and appropriate decel and taper.
- Widen portions of Buffaloe Road and restripe the bridge to accommodate an additional eastbound receiving lane.



- Modify signal timings.

These improvements are also required of other developments (River Towne, etc). It is recommended to reevaluate this intersection prior to the 301st unit of the Brio 55 phase of development (after Phase 2 in this study) to determine what improvements would be the responsibility of the Brio development. The Brio development is anticipated to contribute to the completion of these improvements.

Buffaloe Road and I-540 Westbound Ramps

- Extend the westbound right-turn lane to have full length storage.
- Widen portions of Buffaloe Road and restripe the bridge to accommodate an additional eastbound through lane.
- Modify signal timings.

These improvements are also required of other developments (River Towne, etc). It is recommended to reevaluate this intersection prior to the 301st unit of the Brio 55 phase of development (after Phase 2 in this study) to determine what improvements would be the responsibility of the Brio development. The Brio development is anticipated to contribute to completion of these improvements.

Buffaloe Road and Forestville Road

- Construct an additional eastbound left-turn lane with 600 feet of storage and appropriate decel and taper. Provide an additional receiving lane along Forestville Road with 1,200 feet of storage plus taper.
- Construct a southbound right-turn lane with at least 200 feet of storage and appropriate decel and taper. The right turn lane would operate with free-flow conditions with a westbound receiving lane on Buffaloe Road.
- Construct an additional eastbound through lane on Buffaloe Road that would extend from the I-540 ramps through the intersection to terminate as a right turn lane at Old Milburnie Road.
- Construct a westbound right-turn lane with at least 100 feet of storage and appropriate decel and taper. (River Towne Phase 2)
- Modify signal timings.

Several improvements are also required of other developments that are moving forward or anticipated to move forward in the near future. It is recommended to reevaluate this intersection prior to the 301st unit of the Brio 55 phase of development (after Phase 2 in this study) to determine what improvements should be the responsibility of the Brio development. Improvements at this intersection will require additional right-of-way, which will likely be done as part of other developments at/near the intersection.



Buffaloe Road and Old Milburnie Road

- Construct a southbound right-turn lane with 250 feet of storage and appropriate decel and taper (150 ft storage by Old Milburnie Residential, 250 feet storage by Brio, 300 feet storage by Phase 1 River Towne).

This improvement is assumed to be constructed as part of the Old Milburnie Residential development. It is recommended to be constructed or bonded by the 200th unit in the Old Milburnie residential development or by the first unit within the Brio 55 development (prior to phase 2 in this study).

- Construct a westbound right-turn lane on Buffaloe Road with at least 100 feet of storage and appropriate decel and taper (River Towne Phase 2 only).
- Construct an eastbound right-turn lane on Buffaloe Road with full storage that extends to the I-540 ramps.

The eastbound right turn lane has been constructed with a total distance of approximately 2,000 feet.

Buffaloe Road and Old Crews Road

- Monitor intersection for signalization and install traffic signal when warranted. Coordinate with NCDOT to develop a coordination and timing plan for all signals along Buffaloe Road (Brio and River Towne Phase 2).

This improvement is proposed to be considered as part of the 301st unit in the Brio 55 development (after phase 2 in this study).

- Construct an eastbound right turn lane on Buffaloe Road with 150 feet or 200 feet of storage and appropriate decel and taper (Brio).

This improvement is proposed to be considered as part of the 301st unit in the Brio 55 development phase (after phase 2 in this study).

- Construct westbound and eastbound left-turn lanes, both with at least 100 feet of storage and appropriate decel and taper (River Towne Phase 2).

Forestville Road and N Smithfield Road/Horton Road

- Extend the existing northbound left turn lane on N Smithfield Road to provide a total of 300 feet of storage with appropriate decel and taper.
- Construct eastbound right turn lane with 300 feet of storage and appropriate decel and taper.

This improvement is not necessary based on the lower trip generation and signal timing improvements.



If you should have any questions or comments regarding this letter, please feel free to contact me at rstephenson@drmp.com or by phone at 919-872-5115.

Sincerely,

A handwritten signature in black ink, appearing to read "Rynal Stephenson".

Rynal Stephenson, P.E.
Chief Traffic Analysis Engineer
DRMP, Inc.

Corporate License #F-1524



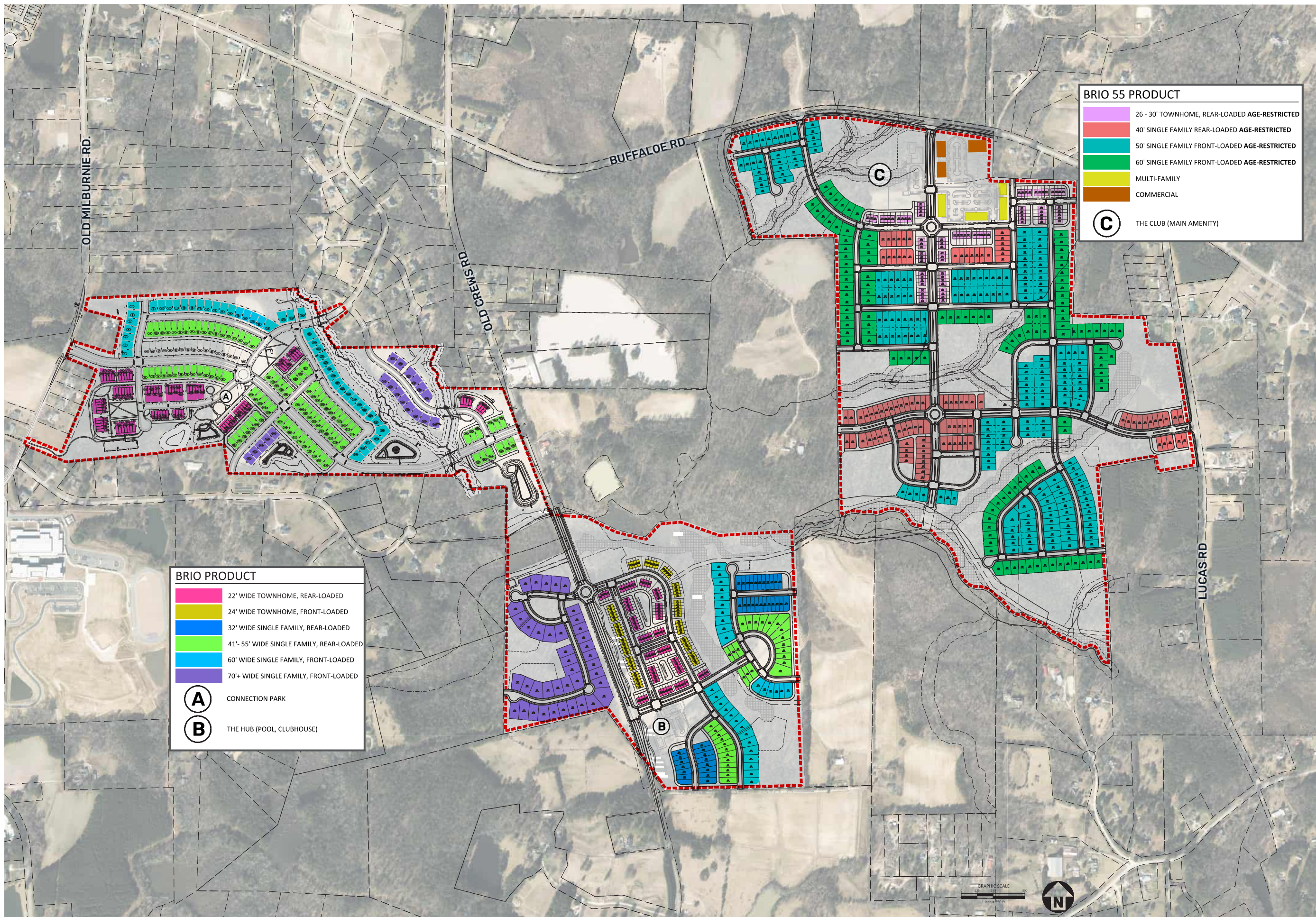
Attachments: Figures

- Adjacent Development Trip Table
- Synchro Reports
- NCDOT TIA Review Letter (Brio aka Buffaloe Road Assemblage)
- NCDOT TIA Review Letter (River Towne Phasing Study)
- NCDOT TIA Review Letter (Old Milburnie Residential)

cc: Clarence Bunting, PE, NCDOT Congestion Management
John Myers, JPM South
Andrew Spiliotis, Town of Knightdale

List of Figures

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Figure 8	Brio 55 Phase 2 Site Trips
Figure 9	Brio 55 Phase 2+3 Site Trips
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Figure 11	Build Phase 1+2 Traffic Volumes
Figure 12	Build Phase 1+2+3 Traffic Volumes



BRIO PRODUCT

- 22' WIDE TOWNHOME, REAR-LOADED
- 24' WIDE TOWNHOME, FRONT-LOADED
- 32' WIDE SINGLE FAMILY, REAR-LOADED
- 41'- 55' WIDE SINGLE FAMILY, REAR-LOADED
- 60' WIDE SINGLE FAMILY, FRONT-LOADED
- 70'+ WIDE SINGLE FAMILY, FRONT-LOADED

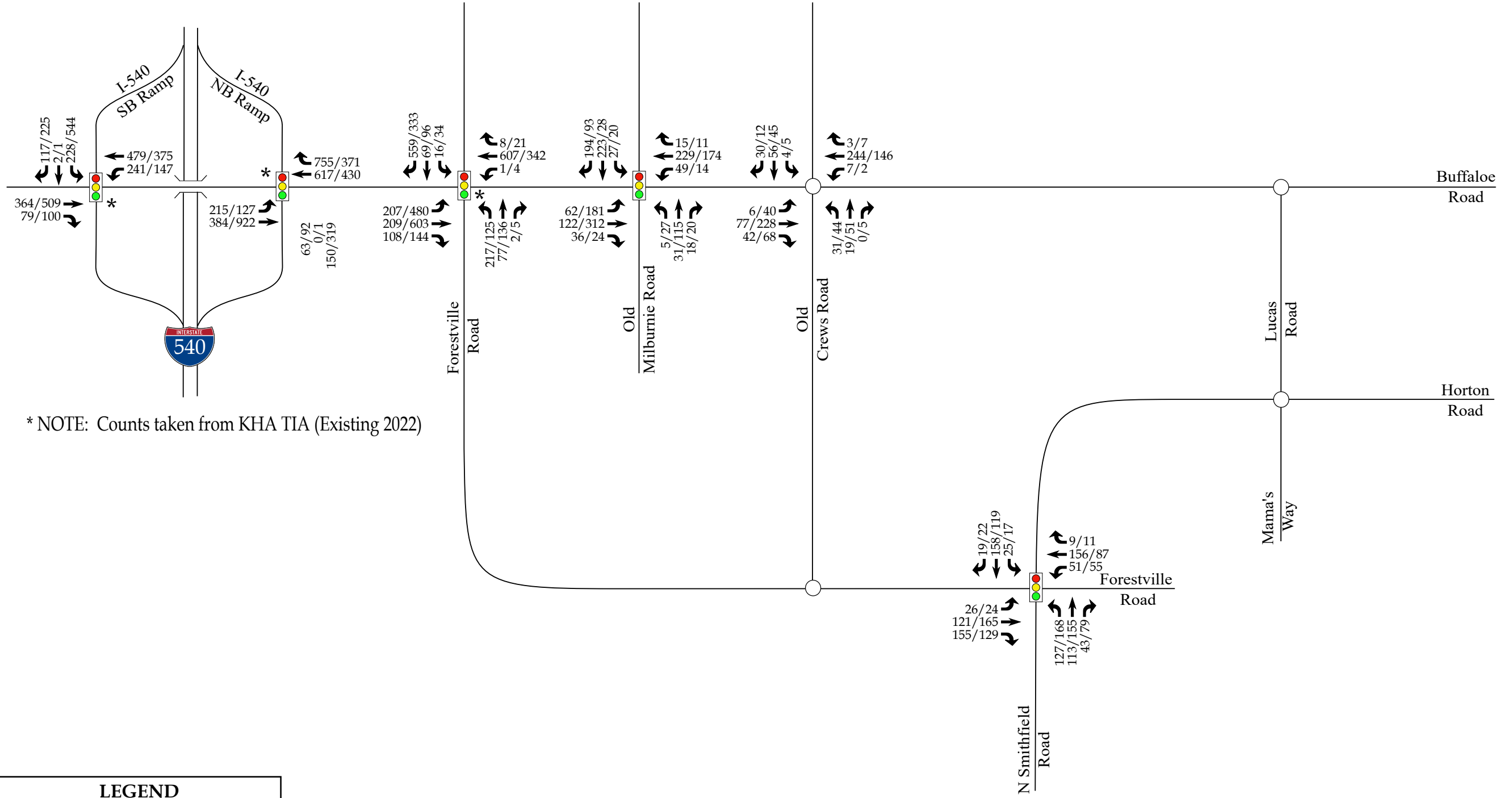
(A) CONNECTION PARK

(B) THE HUB (POOL, CLUBHOUSE)

BRIO 55 PRODUCT

- 26 - 30' TOWNHOME, REAR-LOADED AGE-RESTRICTED
- 40' SINGLE FAMILY REAR-LOADED AGE-RESTRICTED
- 50' SINGLE FAMILY FRONT-LOADED AGE-RESTRICTED
- 60' SINGLE FAMILY FRONT-LOADED AGE-RESTRICTED
- MULTI-FAMILY
- COMMERCIAL

(C) THE CLUB (MAIN AMENITY)



* NOTE: Counts taken from KHA TIA (Existing 2022)

LEGEND

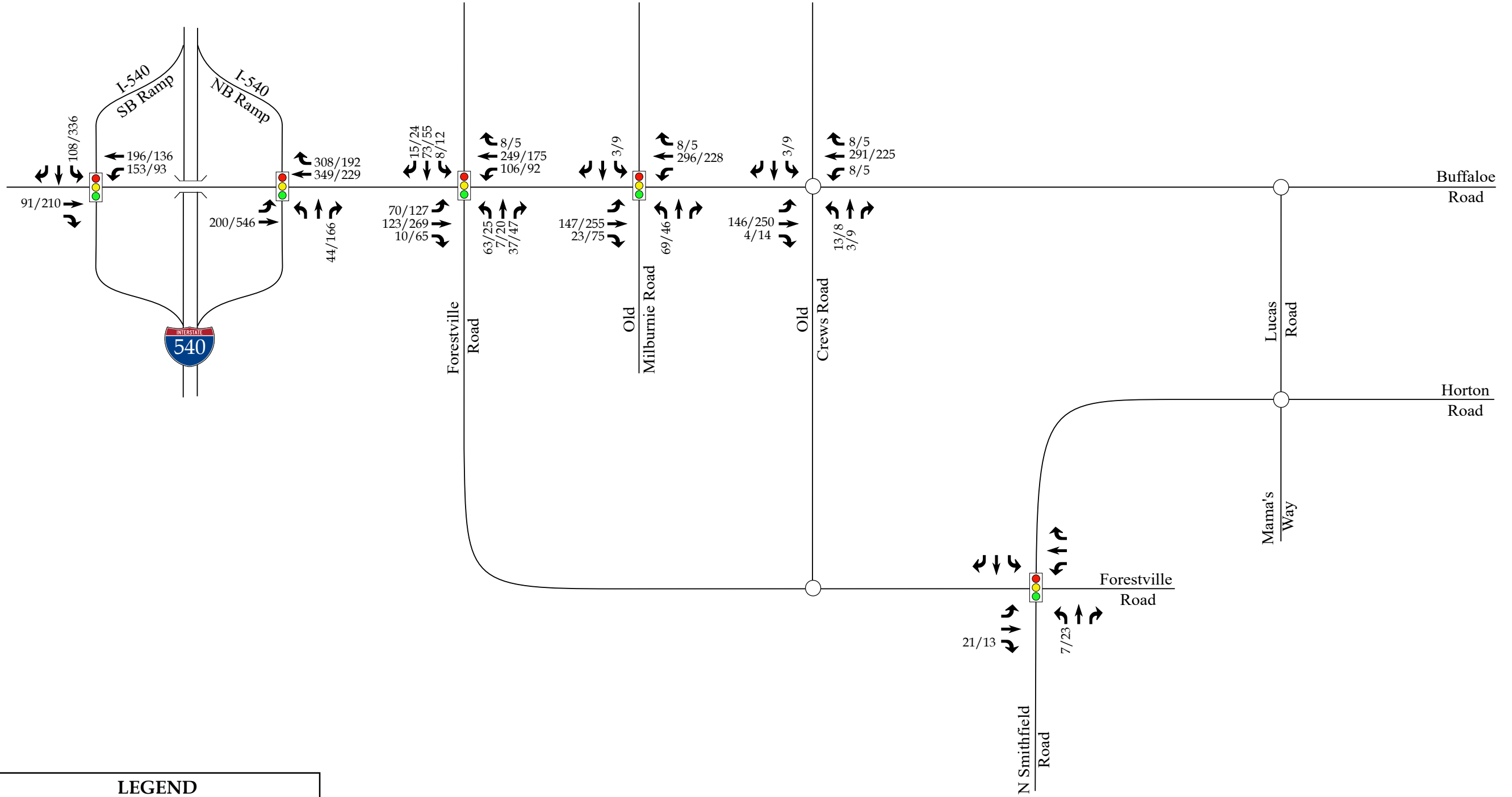
- Unsignalized Intersection
- 🚦 Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic



Brio Phasing Study
Knightdale, NC

Existing (2021/2022)
Peak Hour Traffic

Scale: Not to Scale Figure 2



LEGEND

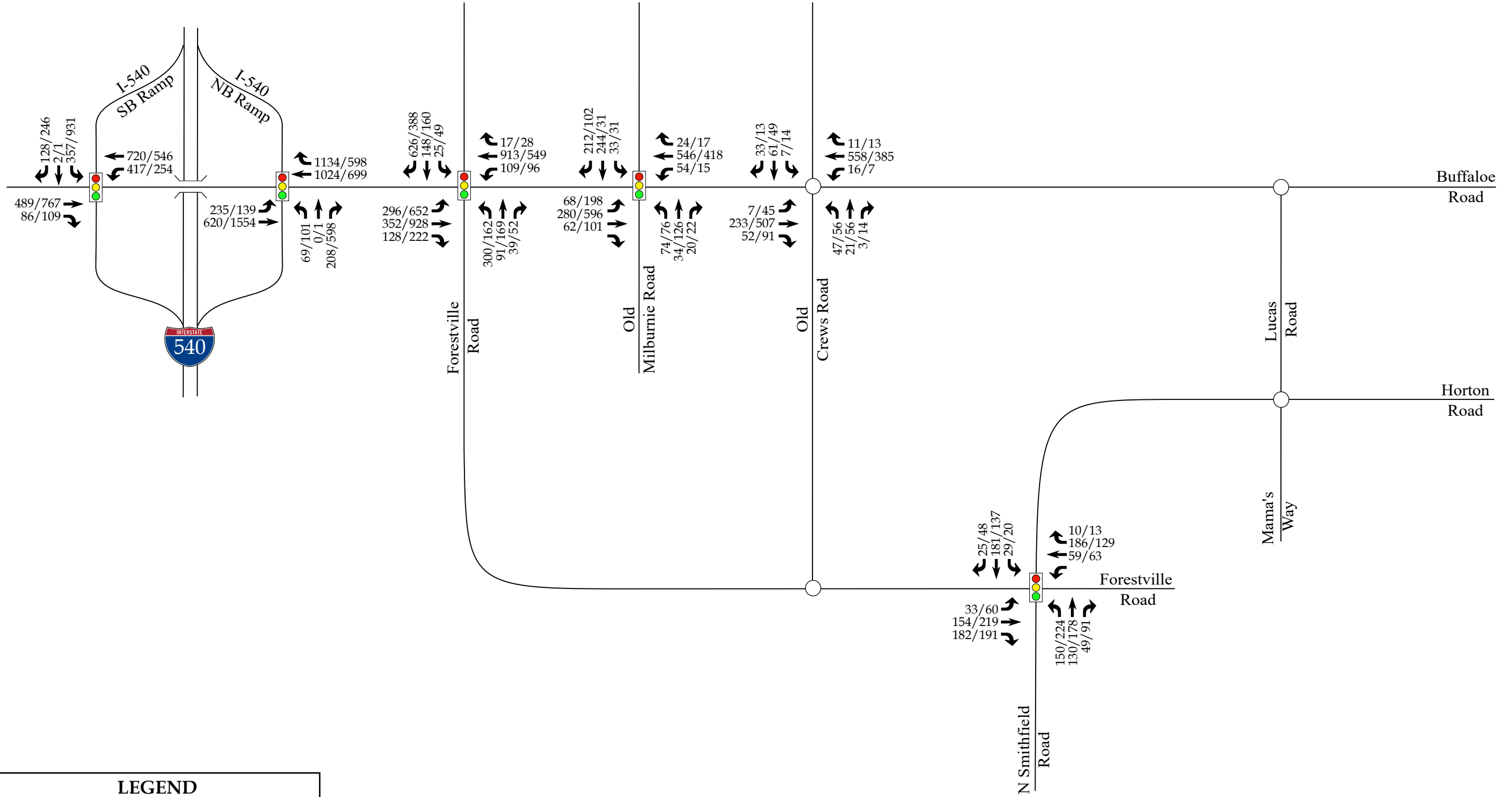
- Unsignalized Intersection
- 🚦 Signalized Intersection
- X/Y → Weekday AM / PM Peak Hour Adjacent Development Trips



Brio Phasing Study
Knightdale, NC

Peak Hour Adjacent
Development Trips
(w/ Phase 1 River Towne)

Scale: Not to Scale Figure 3



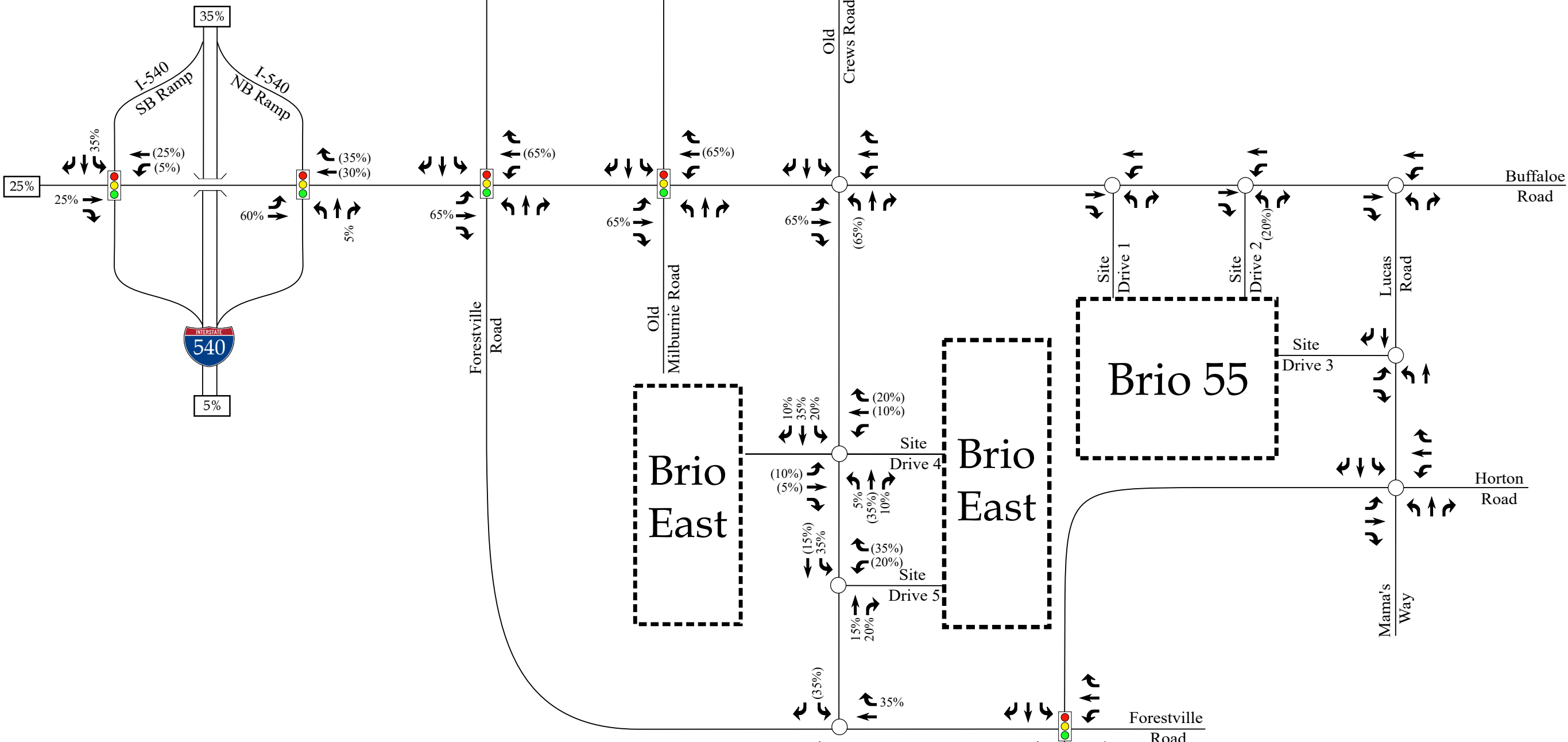
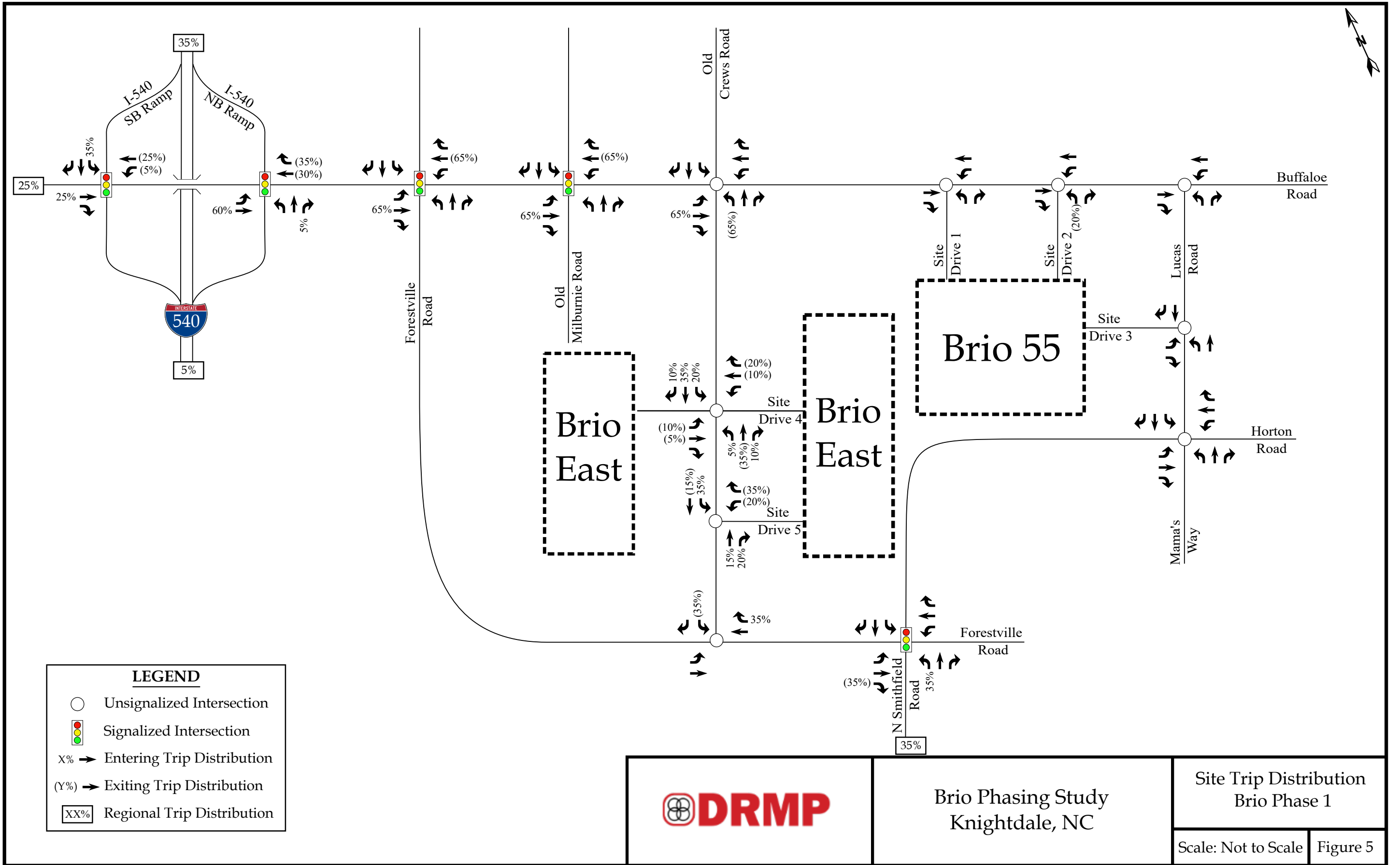
LEGEND	
	Unsignalized Intersection
	Signalized Intersection
X / Y →	Weekday AM / PM Peak Hour Traffic

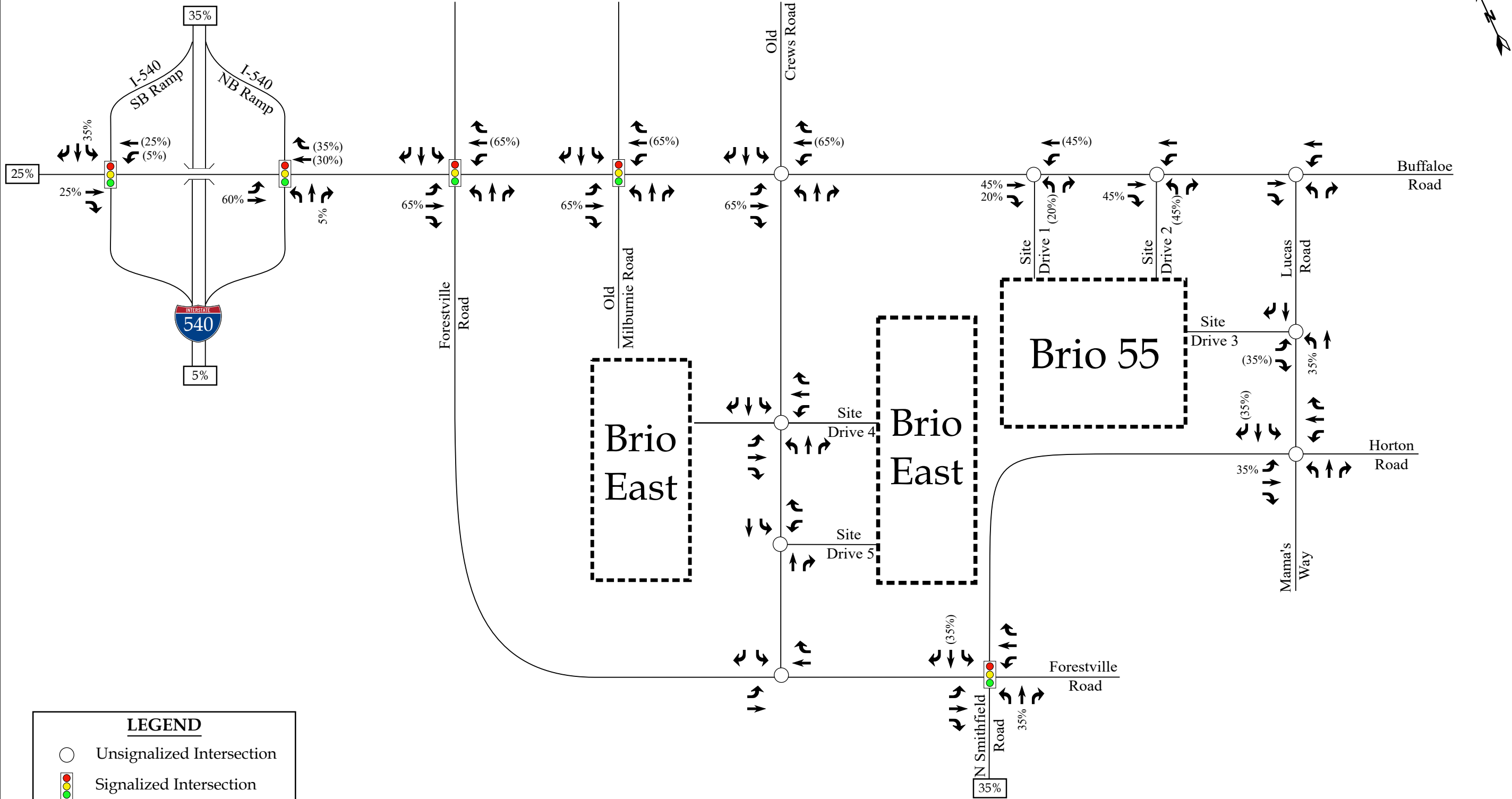
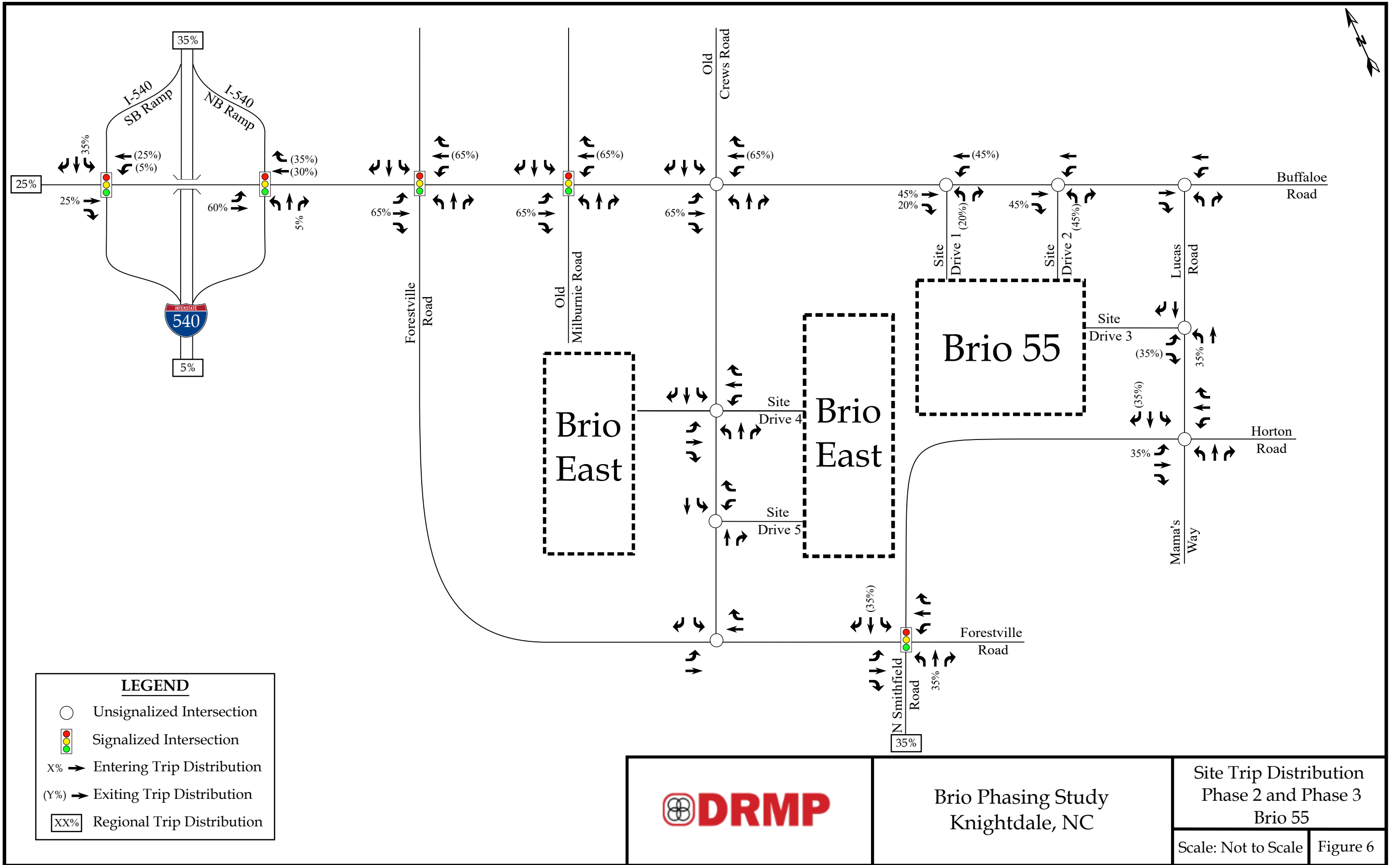


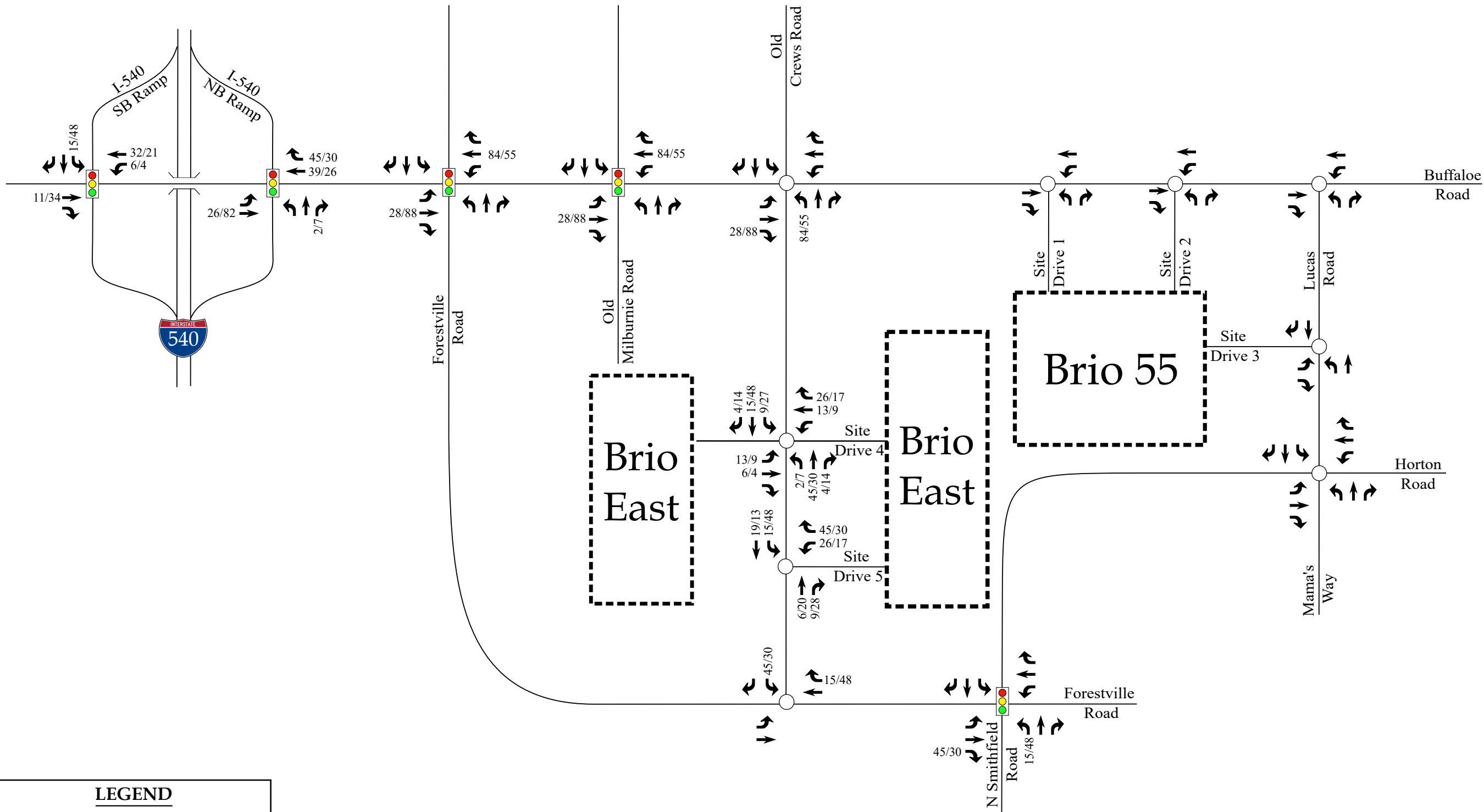
Brio Phasing Study
Knightdale, NC

No-Build (2028)
Peak Hour Traffic

Scale: Not to Scale Figure 4





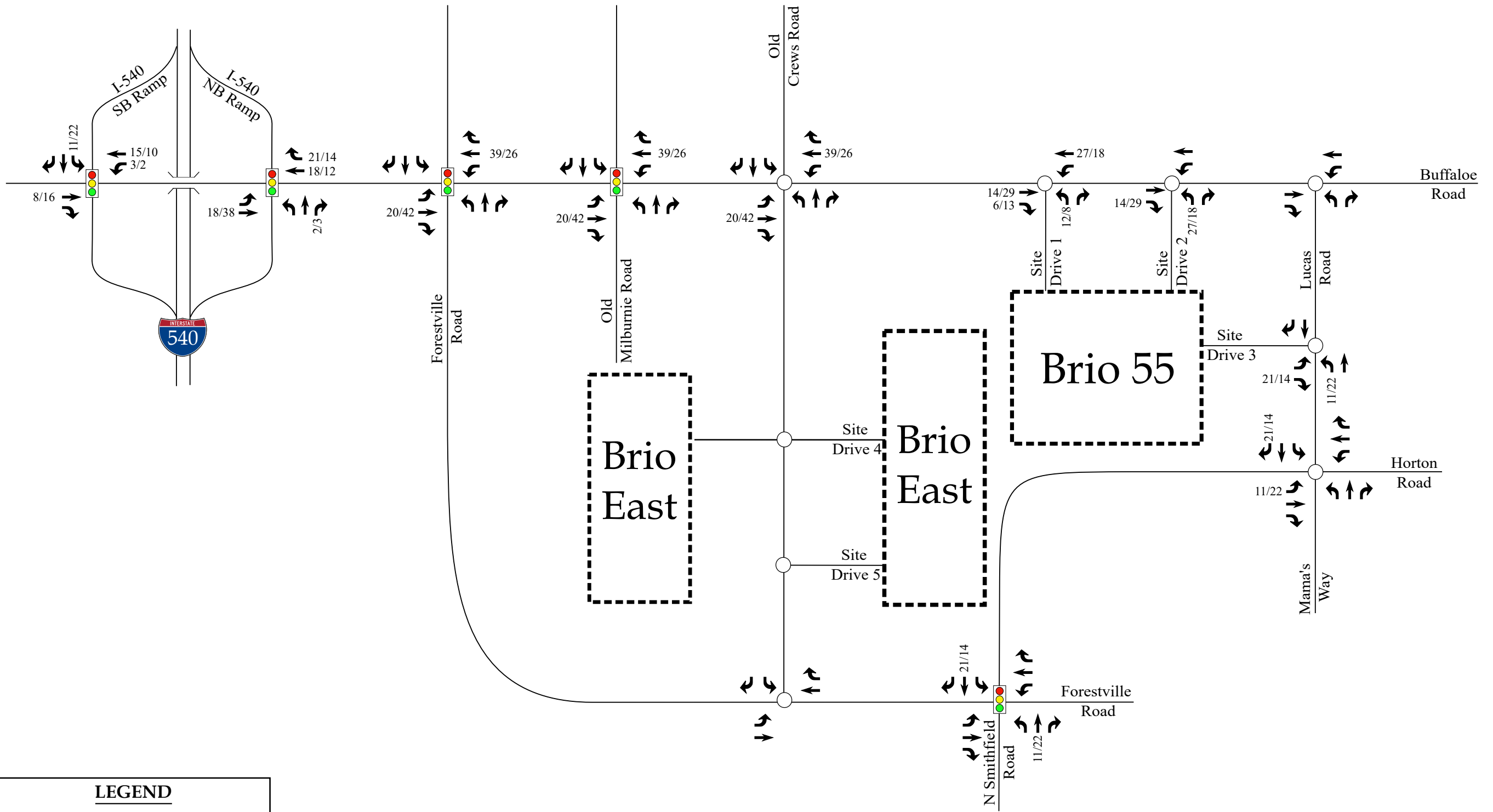


Brio Phasing Study
Knightdale, NC

Site Trip Assignment
Phase 1

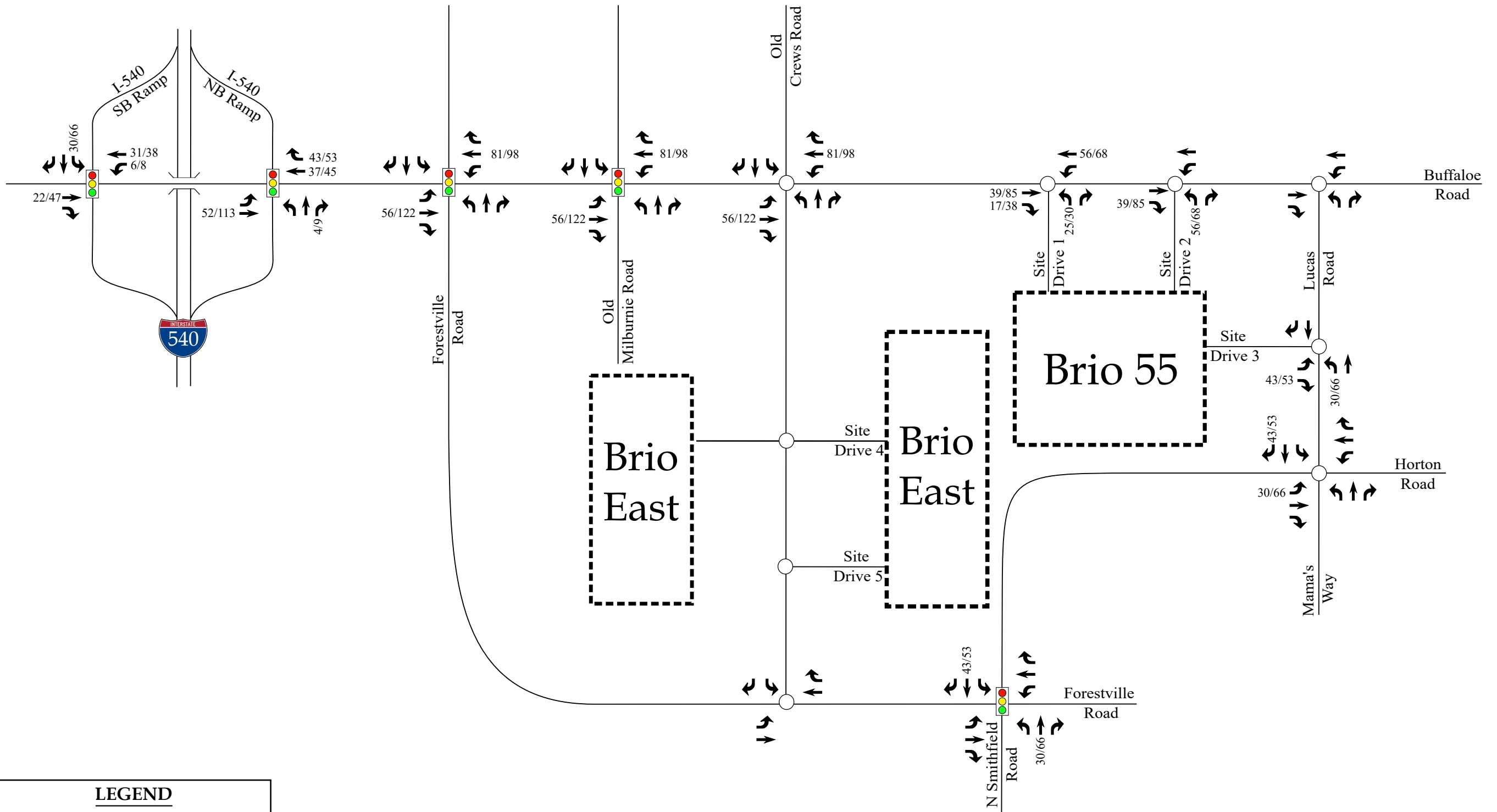
Scale: Not to Scale

Figure 7



LEGEND	
	Unsignalized Intersection
	Signalized Intersection
X / Y →	Weekday AM / PM Peak Hour Site Trips

	Brio Phasing Study Knightdale, NC	Site Trip Assignment Phase 2 Brio 55
		Scale: Not to Scale Figure 8



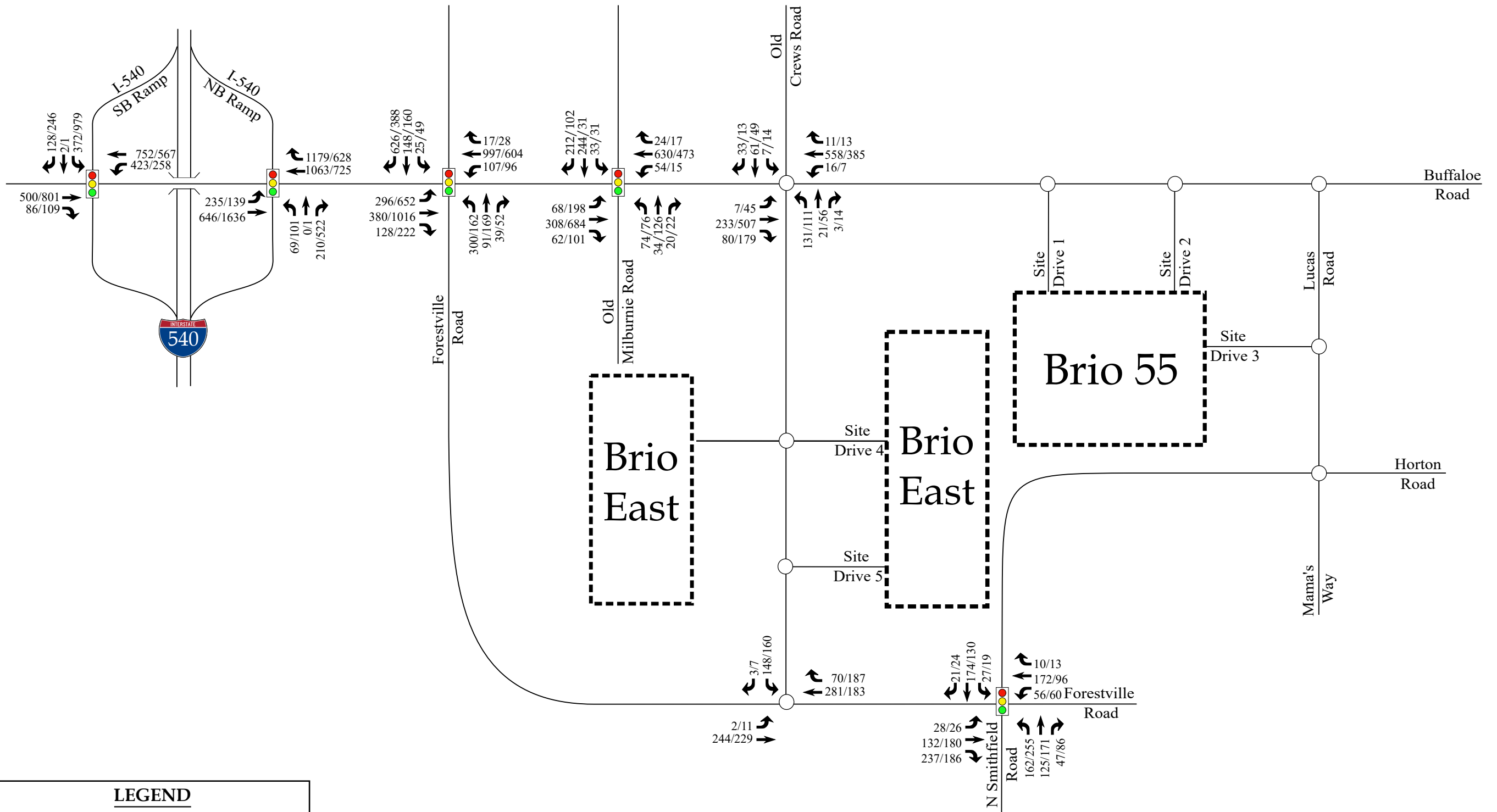
LEGEND	
	Unsignalized Intersection
	Signalized Intersection
X / Y →	Weekday AM / PM Peak Hour Site Trips



Brio Phasing Study
Knightdale, NC

Site Trip Assignment
Phase 2 + Phase 3
Brio 55

Scale: Not to Scale Figure 9



LEGEND

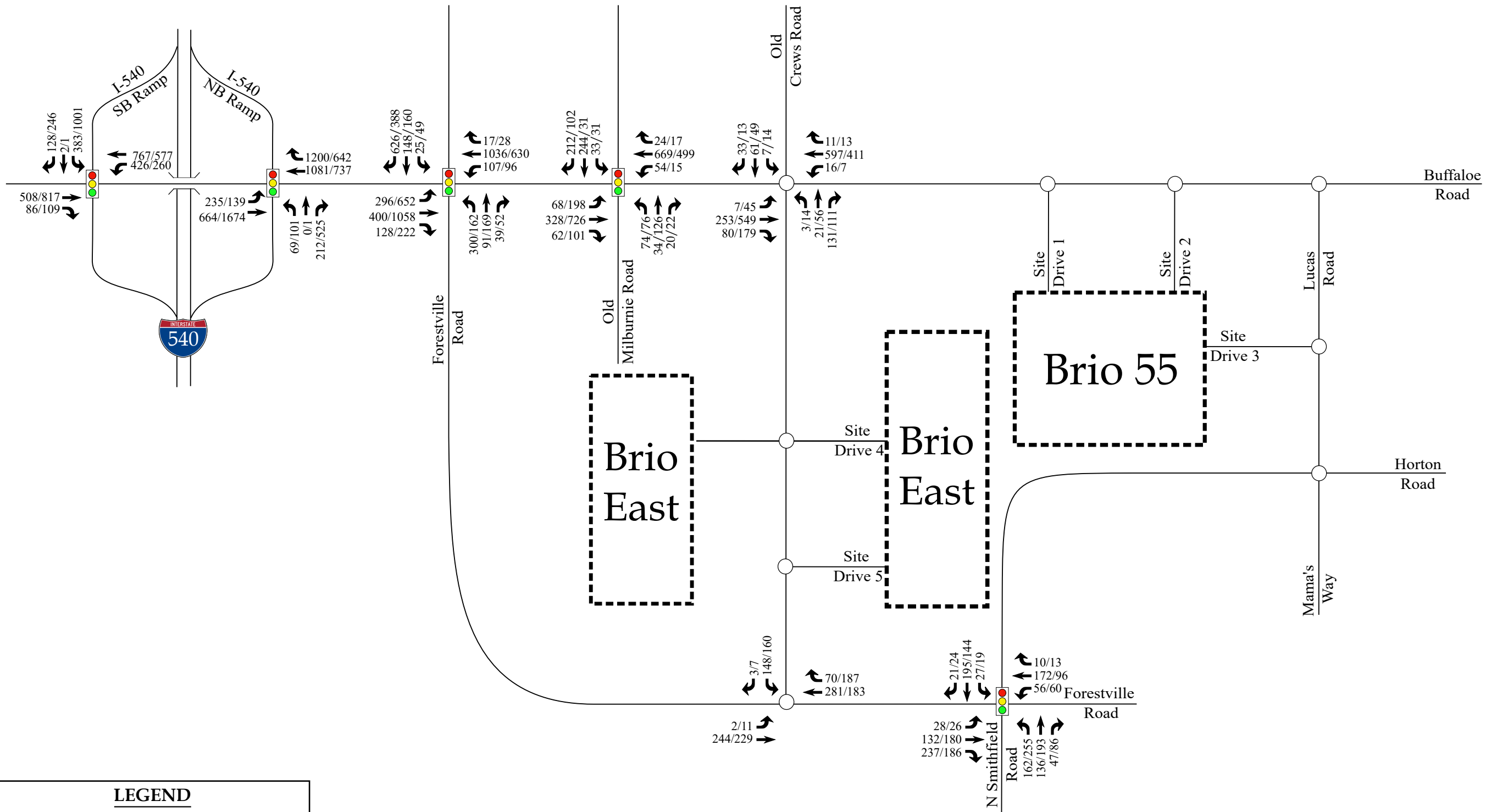
- Unsignalized Intersection
- Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic



Brio Phasing Study
Knightdale, NC

Build (2028)
Phase 1
Peak Hour Traffic

Scale: Not to Scale Figure 10



LEGEND

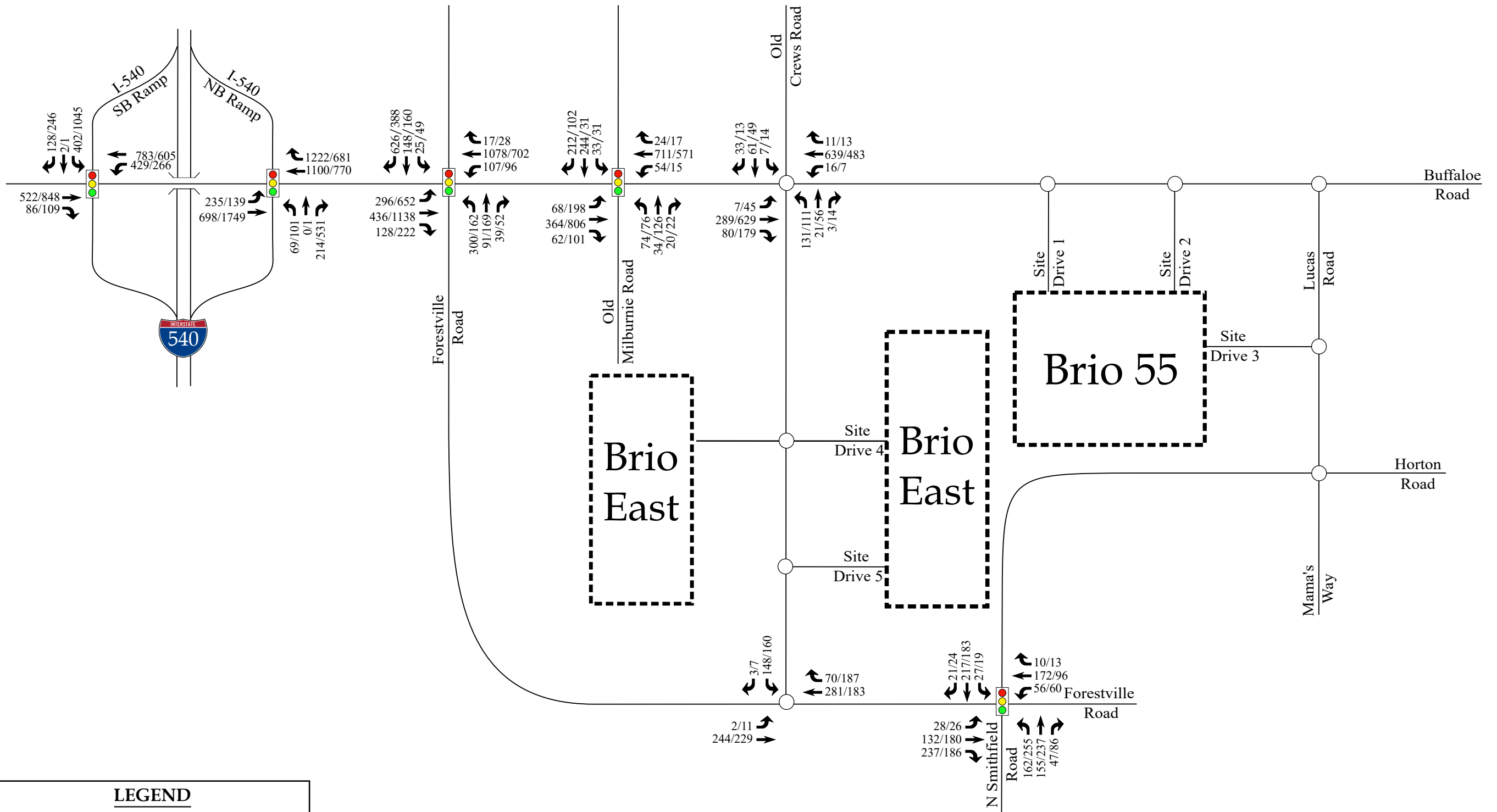
- Unsignalized Intersection
- Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic



Brio Phasing Study
Knightdale, NC

Build (2028)
Phase 1+2
Peak Hour Traffic

Scale: Not to Scale Figure 11



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic



Brio Phasing Study
Knightdale, NC

Build (2028)
Phase 1+2+3
Peak Hour Traffic

Scale: Not to Scale Figure 12

ADJACENT DEVELOPMENT TRIP ASSIGNMENT



















* Assumes all traffic goes through Buffalo at OM Rd and at Old Crews

Intersections	Movement	* * Old Milburnie Road Res		* * Buffalo Shoals		Ph1 = 300 homes Forestville-Needham		Ph 2 = 300 homes River Towne Ph 1		River Towne Ph 2		Buffalo Rd MU		Buffalo Bend		Buffalo Shoals Red		Buffalo Rd MU Red		* * Buffalo Rd Res		* * TOTAL Adj Dev	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1 Buffalo and SB Ramps	SB Right	0	0																			0	0
	SB Through	0	0																			0	0
	SB Left	14	48	12	37	3	31	17	65	17	65	31	103	28	24	-4	-4	-4	-4	11	36	108	336
	WB Right	0	0																			0	0
	WB Through	25	17	31	20	23	13	25	16	25	16	46	30	34	34	-4	-4	-3	-2	19	12	196	136
	WB Left	13	8	20	14	16	3	33	23	33	23	58	38	0	0	-3	-2	-3	-3	19	12	153	93
	NB Right	0	0																			0	0
	NB Through	0	0																			0	0
	NB Left	0	0																			0	0
	EB Right	0	0																			0	0
EB Through	8	27	11	32	6	22	8	28	8	28	15	51	42	35	-3	-3	-2	-2	6	20	91	210	
EB Left	0	0																			0	0	
2 Buffalo and NB Ramps	SB Right	0	0																			0	0
	SB Through	0	0																			0	0
	SB Left	0	0																			0	0
	WB Right	44	29	36	23	33	6	58	39	58	39	92	60	23	23	-5	-4	-6	-5	33	21	308	192
	WB Through	38	25	51	34	39	16	58	39	58	39	104	68	34	34	-7	-6	-6	-5	38	24	349	229
	WB Left	0	0																			0	0
	NB Right	4	14	7	21	2	15	11	37	11	37	19	64	0	0	-2	-2	-3	-3	6	20	44	166
	NB Through	0	0																			0	0
	NB Left	0	0																			0	0
	EB Right	0	0																			0	0
EB Through	23	75	23	69	9	53	25	93	25	93	46	154	70	59	-7	-7	-6	-6	17	56	200	546	
EB Left	0	0																			0	0	
3 Buffalo and Forestville	SB Right	0	0	0	0			0		0		4	13	-12	-3	0	0	-1	-1	24	15	15	24
	SB Through	0	0	0	0	8	10	0		0		0		55	39	0		0		10	6	73	55
	SB Left	0	0	0	0			3	9	3	9									5	3	8	12
	WB Right	0	0	0	0			8	5	8	5											8	5
	WB Through	82	54	2	5			116	78	116	78	4	13	-7	-6	0	-1	0	-1	52	33	249	175
	WB Left	0	0	0	0	8	10	8	5	8	5	0	0	92	77	-1	0	-1	0	0	0	106	92
	NB Right	0	0	0	0	11	15	3	9	3	9	0	0	23	23			0	0			37	47
	NB Through	0	0	0	0	11	15									-1		-1		-2	5	7	20
	NB Left	0	0	5	3	72	22	0	0	0	0	4	13	-18	-11	0	-1	0	-1	0	0	63	25
	EB Right	0	0	2	5	11	68	0	0	0	0	10	7	-11	-13	-1	-1	-1	-1	0	0	10	65
EB Through	27	89	5	3			36	130	36	130	12	8	45	41	-1	-1	-1	-1	0	0	123	269	
EB Left	0	0	0	0			0	0	0	0	12	8	33	33	0	0	-1	-1	26	87	70	127	
4 Buffalo and Old Milburnie	SB Right	0	0																			0	0
	SB Through	0	0																			0	0
	SB Left	0	0					3	9	3	9											3	9
	WB Right	0	0					8	5	8	5											8	5
	WB Through	13	8	2	5	8	10	132	88	132	88	4	13	85	71					52	33	296	228
	WB Left	0	0																			0	0
	NB Right	0	0																			0	0
	NB Through	0	0																			0	0
	NB Left	69	46																			69	46
	EB Right	23	75																			23	75
EB Through	4	14	5	3	11	15	42	148	42	148	12	8	68	64					5	3	147	255	
EB Left	0	0																			0	0	
5 Buffalo and Old Crews	SB Right	0	0																			0	0
	SB Through	0	0																			0	0
	SB Left	0	0					3	9	3	9											3	9
	WB Right	0	0					8	5	8	5											8	5
	WB Through	0	0	2	5	8	10	140	93	140	93	4	13	85	71					52	33	291	225
	WB Left	0	0					8	5	8	5											8	5
	NB Right	0	0					3	9	3	9											3	9
	NB Through	0	0																			0	0
	NB Left	13	8																			13	8
	EB Right	4	14																			4	14
EB Through	0	0	5	3	11	15	45	157	45	157	12	8	68	64					5	3	146	250	
EB Left	0	0																			0	0	
9 N Smithfield Road/Horton Road and Forestville Road	SB Right	0	0																			0	0
	SB Through	0	0																			0	0
	SB Left	0	0																			0	0
	WB Right	0	0																			0	0
	WB Through	0	0																			0	0
	WB Left	0	0																			0	0
	NB Right	0	0																			0	0
	NB Through	0	0																			0	0
NB Left	4	14					3	9													7	23	
EB Right	13	8					8	5													21	13	
EB Through	0	0																			0	0	
EB Left	0	0																			0	0	

w/o RiverTowne Ph 2

Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

No-Build (2028) AM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	489	86	417	720	0	0	0	0	357	2	128
Future Volume (vph)	0	489	86	417	720	0	0	0	0	357	2	128
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Flt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1775	1583
Flt Permitted				0.194							0.953	
Satd. Flow (perm)	0	1863	1583	361	1863	0	0	0	0	0	1775	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			81									142
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	543	96	463	800	0	0	0	0	397	2	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	543	96	463	800	0	0	0	0	0	399	142
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		55.0	55.0	20.0	75.0					35.0	35.0	35.0
Total Split (%)		50.0%	50.0%	18.2%	68.2%					31.8%	31.8%	31.8%
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		44.2	44.2	70.3	70.3						29.7	29.7
Actuated g/C Ratio		0.40	0.40	0.64	0.64						0.27	0.27
v/c Ratio		0.72	0.14	0.93	0.67						0.83	0.27

Lanes, Volumes, Timings
 1: I-540 EB/SB Ramp & Buffalo Road

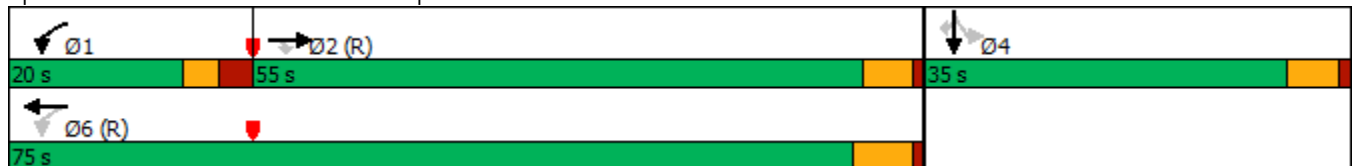
No-Build (2028) AM
 Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		34.7	6.5	48.9	13.5						53.3	6.1
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		34.7	6.5	48.9	13.5						53.3	6.1
LOS		C	A	D	B						D	A
Approach Delay		30.5			26.5						40.9	
Approach LOS		C			C						D	
Queue Length 50th (ft)		347	7	251	269						259	0
Queue Length 95th (ft)		425	36	m#317	m217						#381	46
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		846	763	500	1219						511	557
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.64	0.13	0.93	0.66						0.78	0.25

Intersection Summary



















Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 30.7
 Intersection Capacity Utilization 101.6%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

No-Build (2028) PM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	767	109	254	546	0	0	0	0	931	1	246
Future Volume (vph)	0	767	109	254	546	0	0	0	0	931	1	246
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1773	1583
Flt Permitted				0.072							0.952	
Satd. Flow (perm)	0	1863	1583	134	1863	0	0	0	0	0	1773	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									114
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	852	121	282	607	0	0	0	0	1034	1	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	852	121	282	607	0	0	0	0	0	1035	273
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Maximum Green (s)		50.9	50.9	8.2	64.1					44.6	44.6	44.6
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		6.0	6.0	1.0	6.0					3.0	3.0	3.0
Minimum Gap (s)		3.2	3.2	1.0	3.2					1.0	1.0	1.0
Time Before Reduce (s)		15.0	15.0	0.0	15.0					0.0	0.0	0.0

Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

No-Build (2028) PM
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)		30.0	30.0	0.0	30.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		51.0	51.0	65.0	65.0						45.0	45.0
Actuated g/C Ratio		0.42	0.42	0.54	0.54						0.38	0.38
v/c Ratio		1.08	0.17	1.45	0.60						1.56	0.41
Control Delay		88.8	9.6	257.3	9.2						288.0	17.7
Queue Delay		11.6	0.0	0.0	0.0						1.1	0.0
Total Delay		100.3	9.6	257.3	9.2						289.1	17.7
LOS		F	A	F	A						F	B
Approach Delay		89.0			87.9						232.5	
Approach LOS		F			F						F	
Queue Length 50th (ft)		~735	21	~240	92						~1132	87
Queue Length 95th (ft)		#980	58	#417	112						#1387	161
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	195	1009						664	664
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		245	0	0	0						97	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.56	0.17	1.45	0.60						1.83	0.41

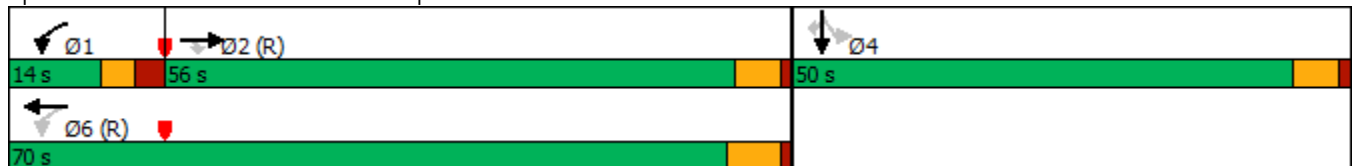
Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.56
 Intersection Signal Delay: 147.9
 Intersection Capacity Utilization 153.4%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H



















- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) AM Brio Phase 1 - No River Towne
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	492	86	390	727	0	0	0	0	355	2	128
Future Volume (vph)	0	492	86	390	727	0	0	0	0	355	2	128
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1775	1583
Flt Permitted				0.214							0.953	
Satd. Flow (perm)	0	1863	1583	399	1863	0	0	0	0	0	1775	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			81									142
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	547	96	433	808	0	0	0	0	394	2	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	547	96	433	808	0	0	0	0	0	396	142
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		55.0	55.0	20.0	75.0					35.0	35.0	35.0
Total Split (%)		50.0%	50.0%	18.2%	68.2%					31.8%	31.8%	31.8%
Maximum Green (s)		49.9	49.9	14.2	69.1					29.6	29.6	29.6
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		6.0	6.0	1.0	6.0					3.0	3.0	3.0
Minimum Gap (s)		3.2	3.2	1.0	3.2					1.0	1.0	1.0
Time Before Reduce (s)		15.0	15.0	0.0	15.0					0.0	0.0	0.0

Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) AM Brio Phase 1 - No River Towne
Brio Phasing Study

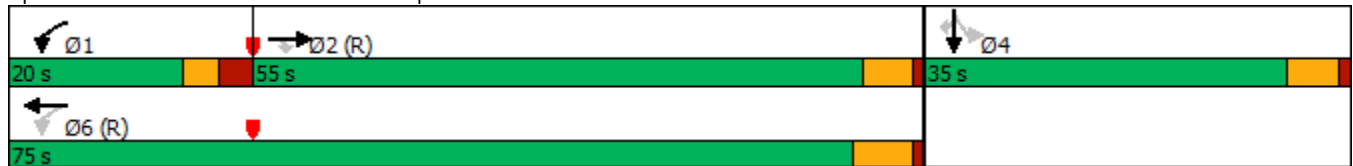
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)		30.0	30.0	0.0	30.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		46.7	46.7	70.7	70.7						29.3	29.3
Actuated g/C Ratio		0.42	0.42	0.64	0.64						0.27	0.27
v/c Ratio		0.69	0.13	0.88	0.68						0.84	0.27
Control Delay		32.2	6.4	41.5	13.7						54.1	6.2
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		32.2	6.4	41.5	13.7						54.1	6.2
LOS		C	A	D	B						D	A
Approach Delay		28.3			23.4						41.4	
Approach LOS		C			C						D	
Queue Length 50th (ft)		332	7	221	281						260	0
Queue Length 95th (ft)		427	36	m#275	m221						#380	46
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		866	779	492	1221						507	554
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.63	0.12	0.88	0.66						0.78	0.26

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 28.7
 Intersection Capacity Utilization 100.8%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service G



















95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1 - No River Towne
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	773	109	235	551	0	0	0	0	914	1	246
Future Volume (vph)	0	773	109	235	551	0	0	0	0	914	1	246
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1773	1583
Flt Permitted				0.072							0.952	
Satd. Flow (perm)	0	1863	1583	134	1863	0	0	0	0	0	1773	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									116
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	859	121	261	612	0	0	0	0	1016	1	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	859	121	261	612	0	0	0	0	0	1017	273
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Maximum Green (s)		50.9	50.9	8.2	64.1					44.6	44.6	44.6
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		6.0	6.0	1.0	6.0					3.0	3.0	3.0
Minimum Gap (s)		3.2	3.2	1.0	3.2					1.0	1.0	1.0
Time Before Reduce (s)		15.0	15.0	0.0	15.0					0.0	0.0	0.0

Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1 - No River Towne
Brio Phasing Study

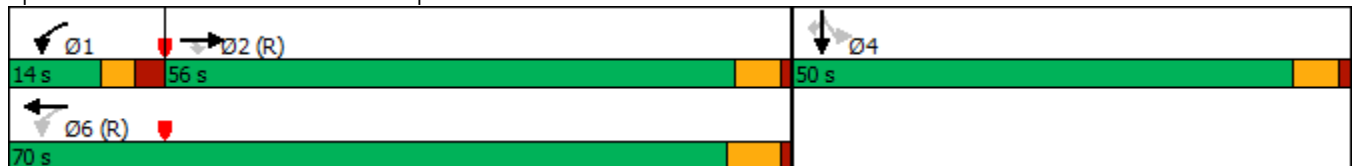
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)		30.0	30.0	0.0	30.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		51.0	51.0	65.0	65.0						45.0	45.0
Actuated g/C Ratio		0.42	0.42	0.54	0.54						0.38	0.38
v/c Ratio		1.09	0.17	1.34	0.61						1.53	0.41
Control Delay		91.7	9.6	214.7	9.4						276.4	17.5
Queue Delay		8.1	0.0	0.0	0.0						1.0	0.0
Total Delay		99.8	9.6	214.7	9.4						277.4	17.5
LOS		F	A	F	A						F	B
Approach Delay		88.7			70.8						222.4	
Approach LOS		F			E						F	
Queue Length 50th (ft)		~747	21	~206	94						~1103	85
Queue Length 95th (ft)		#992	58	#379	115						#1356	160
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	195	1009						664	666
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		245	0	0	0						87	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.57	0.17	1.34	0.61						1.76	0.41

Intersection Summary



















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.53
 Intersection Signal Delay: 138.6
 Intersection Capacity Utilization 150.4%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	500	86	423	752	0	0	0	0	372	2	128
Future Volume (vph)	0	500	86	423	752	0	0	0	0	372	2	128
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1775	1583
Flt Permitted				0.090							0.953	
Satd. Flow (perm)	0	1863	1583	168	1863	0	0	0	0	0	1775	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									142
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	556	96	470	836	0	0	0	0	413	2	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	556	96	470	836	0	0	0	0	0	415	142
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Maximum Green (s)		50.9	50.9	8.2	64.1					44.6	44.6	44.6
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		6.0	6.0	1.0	6.0					3.0	3.0	3.0
Minimum Gap (s)		3.2	3.2	1.0	3.2					1.0	1.0	1.0
Time Before Reduce (s)		15.0	15.0	0.0	15.0					0.0	0.0	0.0

Lanes, Volumes, Timings
 1: I-540 EB/SB Ramp & Buffalo Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)		30.0	30.0	0.0	30.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		39.5	39.5	75.3	75.3						34.7	34.7
Actuated g/C Ratio		0.33	0.33	0.63	0.63						0.29	0.29
v/c Ratio		0.91	0.17	0.91	0.72						0.81	0.25
Control Delay		57.6	8.6	58.3	17.1						51.8	5.4
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		57.6	8.6	58.3	17.1						51.8	5.4
LOS		E	A	E	B						D	A
Approach Delay		50.3			31.9						40.0	
Approach LOS		D			C						D	
Queue Length 50th (ft)		413	11	327	293						297	0
Queue Length 95th (ft)		481	42	m#527	m238						375	42
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	517	1169						665	682
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.70	0.13	0.91	0.72						0.62	0.21



















Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 38.5
 Intersection Capacity Utilization 104.4%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	801	109	258	567	0	0	0	0	979	1	246
Future Volume (vph)	0	801	109	258	567	0	0	0	0	979	1	246
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1773	1583
Flt Permitted				0.072							0.952	
Satd. Flow (perm)	0	1863	1583	134	1863	0	0	0	0	0	1773	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									108
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	890	121	287	630	0	0	0	0	1088	1	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	890	121	287	630	0	0	0	0	0	1089	273
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Maximum Green (s)		50.9	50.9	8.2	64.1					44.6	44.6	44.6
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		6.0	6.0	1.0	6.0					3.0	3.0	3.0
Minimum Gap (s)		3.2	3.2	1.0	3.2					1.0	1.0	1.0
Time Before Reduce (s)		15.0	15.0	0.0	15.0					0.0	0.0	0.0

Lanes, Volumes, Timings
 1: I-540 EB/SB Ramp & Buffalo Road

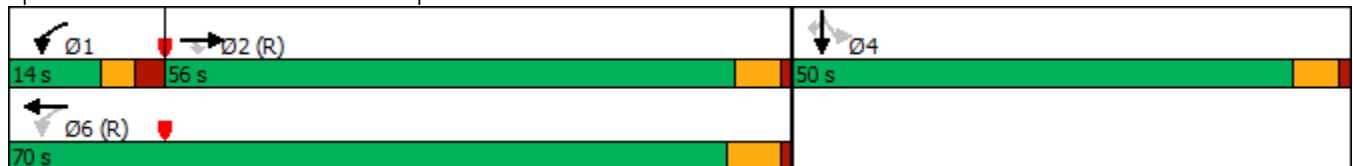
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)		30.0	30.0	0.0	30.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		51.0	51.0	65.0	65.0						45.0	45.0
Actuated g/C Ratio		0.42	0.42	0.54	0.54						0.38	0.38
v/c Ratio		1.13	0.17	1.47	0.62						1.64	0.41
Control Delay		105.5	9.6	267.2	9.4						323.0	18.4
Queue Delay		2.5	0.0	0.0	0.0						1.6	0.0
Total Delay		108.1	9.6	267.2	9.4						324.6	18.4
LOS		F	A	F	A						F	B
Approach Delay		96.3			90.1						263.3	
Approach LOS		F			F						F	
Queue Length 50th (ft)		~796	21	~248	92						~1219	90
Queue Length 95th (ft)		#1043	58	#428	120						#1474	166
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	195	1009						664	661
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		245	0	0	0						133	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.63	0.17	1.47	0.62						2.05	0.41

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.64
 Intersection Signal Delay: 163.7
 Intersection Capacity Utilization 160.2%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H



















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Brio, All Adj Dev, No River Towne
Build (2028) AM Brio Ph 1+2 - No River Towne

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	500	86	393	742	0	0	0	0	366	2	128
Future Volume (vph)	0	500	86	393	742	0	0	0	0	366	2	128
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1775	1583
Flt Permitted				0.201							0.953	
Satd. Flow (perm)	0	1863	1583	374	1863	0	0	0	0	0	1775	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			81									141
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	556	96	437	824	0	0	0	0	407	2	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	556	96	437	824	0	0	0	0	0	409	142
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		55.0	55.0	20.0	75.0					35.0	35.0	35.0
Total Split (%)		50.0%	50.0%	18.2%	68.2%					31.8%	31.8%	31.8%
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		46.0	46.0	69.9	69.9						30.1	30.1
Actuated g/C Ratio		0.42	0.42	0.64	0.64						0.27	0.27
v/c Ratio		0.71	0.14	0.92	0.70						0.84	0.26

Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

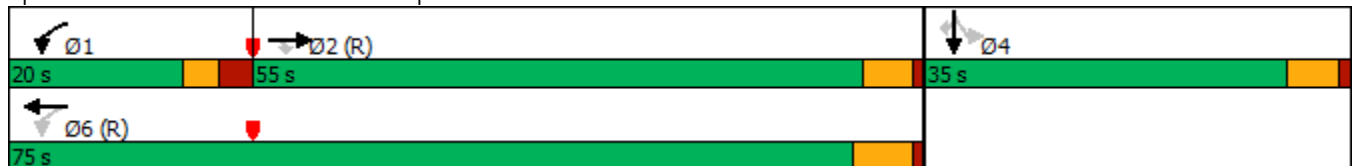
Brio, All Adj Dev, No River Towne
Build (2028) AM Brio Ph 1+2 - No River Towne

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		33.2	6.3	46.8	13.7						53.8	6.3
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		33.2	6.3	46.8	13.7						53.8	6.3
LOS		C	A	D	B						D	A
Approach Delay		29.3			25.2						41.5	
Approach LOS		C			C						D	
Queue Length 50th (ft)		350	7	225	272						265	1
Queue Length 95th (ft)		434	36	m#261	m217						#417	47
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		859	773	476	1215						514	559
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.65	0.12	0.92	0.68						0.80	0.25

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 29.9
 Intersection Capacity Utilization 102.1%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.



















Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1+2 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	789	109	237	561	0	0	0	0	936	1	246
Future Volume (vph)	0	789	109	237	561	0	0	0	0	936	1	246
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1773	1583
Flt Permitted				0.072							0.952	
Satd. Flow (perm)	0	1863	1583	134	1863	0	0	0	0	0	1773	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									113
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	877	121	263	623	0	0	0	0	1040	1	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	877	121	263	623	0	0	0	0	0	1041	273
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		51.0	51.0	65.0	65.0						45.0	45.0
Actuated g/C Ratio		0.42	0.42	0.54	0.54						0.38	0.38
v/c Ratio		1.11	0.17	1.35	0.62						1.57	0.41

Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1+2 - No River Towne
Brio Phasing Study

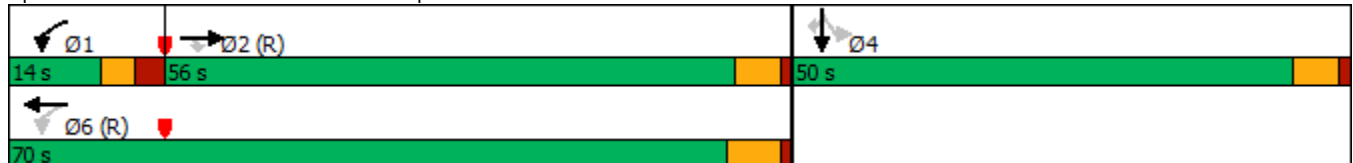
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		99.6	9.6	218.4	9.4						291.9	17.8
Queue Delay		2.5	0.0	0.0	0.0						1.2	0.0
Total Delay		102.1	9.6	218.4	9.4						293.1	17.8
LOS		F	A	F	A						F	B
Approach Delay		90.9			71.4						235.9	
Approach LOS		F			E						F	
Queue Length 50th (ft)		~775	21	~209	94						~1142	87
Queue Length 95th (ft)		#1022	58	#383	115						#1397	162
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	195	1009						664	664
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		245	0	0	0						105	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.61	0.17	1.35	0.62						1.86	0.41

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.57
 Intersection Signal Delay: 145.1
 Intersection Capacity Utilization 153.5%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H



















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) AM Brio Phase 1+2
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	508	86	426	767	0	0	0	0	383	2	128
Future Volume (vph)	0	508	86	426	767	0	0	0	0	383	2	128
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1775	1583
Flt Permitted				0.089							0.953	
Satd. Flow (perm)	0	1863	1583	166	1863	0	0	0	0	0	1775	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									137
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	564	96	473	852	0	0	0	0	426	2	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	564	96	473	852	0	0	0	0	0	428	142
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		40.1	40.1	74.6	74.6						35.4	35.4
Actuated g/C Ratio		0.33	0.33	0.62	0.62						0.30	0.30
v/c Ratio		0.91	0.17	0.95	0.74						0.82	0.25

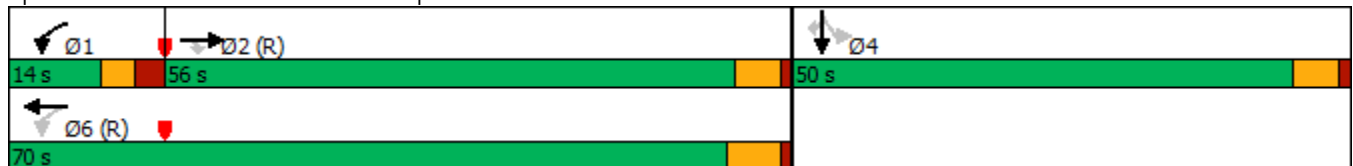
Lanes, Volumes, Timings
 1: I-540 EB/SB Ramp & Buffalo Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		56.7	8.3	63.0	17.6						51.7	5.9
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		56.7	8.3	63.0	17.6						51.7	5.9
LOS		E	A	E	B						D	A
Approach Delay		49.7			33.8						40.3	
Approach LOS		D			C						D	
Queue Length 50th (ft)		422	11	331	301						306	3
Queue Length 95th (ft)		491	42	m#531	m257						385	44
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	496	1157						665	679
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.71	0.13	0.95	0.74						0.64	0.21

Intersection Summary



















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 39.3
 Intersection Capacity Utilization 105.7%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1+2
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	817	109	260	577	0	0	0	0	1001	1	246
Future Volume (vph)	0	817	109	260	577	0	0	0	0	1001	1	246
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1773	1583
Flt Permitted				0.072							0.952	
Satd. Flow (perm)	0	1863	1583	134	1863	0	0	0	0	0	1773	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									106
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	908	121	289	641	0	0	0	0	1112	1	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	908	121	289	641	0	0	0	0	0	1113	273
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		51.0	51.0	65.0	65.0						45.0	45.0
Actuated g/C Ratio		0.42	0.42	0.54	0.54						0.38	0.38
v/c Ratio		1.15	0.17	1.48	0.64						1.68	0.41

Lanes, Volumes, Timings
 1: I-540 EB/SB Ramp & Buffalo Road

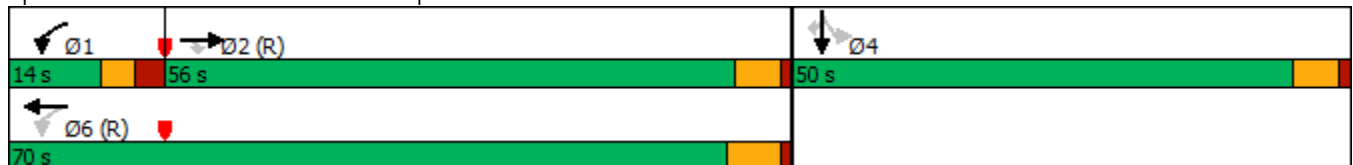
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		114.0	9.6	271.1	9.6						338.6	18.6
Queue Delay		2.5	0.0	0.0	0.0						1.9	0.0
Total Delay		116.5	9.6	271.1	9.6						340.5	18.6
LOS		F	A	F	A						F	B
Approach Delay		104.0			90.9						277.1	
Approach LOS		F			F						F	
Queue Length 50th (ft)		-825	21	-252	92						-1258	91
Queue Length 95th (ft)		#1072	58	#432	129						#1516	167
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	195	1009						664	659
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		245	0	0	0						148	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.66	0.17	1.48	0.64						2.16	0.41

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.68
 Intersection Signal Delay: 172.1
 Intersection Capacity Utilization 163.3%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H



















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	522	86	429	783	0	0	0	0	402	2	128
Future Volume (vph)	0	522	86	429	783	0	0	0	0	402	2	128
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1775	1583
Flt Permitted				0.086							0.953	
Satd. Flow (perm)	0	1863	1583	160	1863	0	0	0	0	0	1775	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									131
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	580	96	477	870	0	0	0	0	447	2	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	580	96	477	870	0	0	0	0	0	449	142
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		41.4	41.4	73.5	73.5						36.5	36.5
Actuated g/C Ratio		0.34	0.34	0.61	0.61						0.30	0.30
v/c Ratio		0.90	0.16	1.03	0.76						0.83	0.25

Lanes, Volumes, Timings
 1: I-540 EB/SB Ramp & Buffalo Road

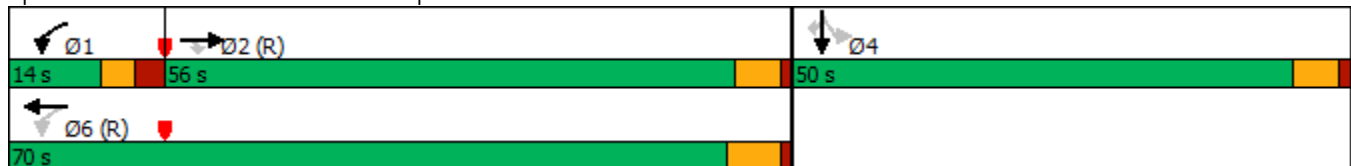
Build (2028) AM Phase 1+2+3 (Full Build)
 Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		55.0	8.0	79.9	17.8						52.3	6.5
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		55.0	8.0	79.9	17.8						52.3	6.5
LOS		D	A	E	B						D	A
Approach Delay		48.3			39.8						41.3	
Approach LOS		D			D						D	
Queue Length 50th (ft)		438	11	336	305						320	6
Queue Length 95th (ft)		510	42	m#532	m259						409	47
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	461	1141						665	675
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.73	0.13	1.03	0.76						0.68	0.21

Intersection Summary



















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 42.3
 Intersection Capacity Utilization 107.0%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	848	109	266	605	0	0	0	0	1045	1	246
Future Volume (vph)	0	848	109	266	605	0	0	0	0	1045	1	246
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	400		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	0	1773	1583
Flt Permitted				0.072							0.952	
Satd. Flow (perm)	0	1863	1583	134	1863	0	0	0	0	0	1773	1583
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)			75									101
Link Speed (mph)		45			45			25				25
Link Distance (ft)		1464			958			171			1013	
Travel Time (s)		22.2			14.5			4.7			27.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	942	121	296	672	0	0	0	0	1161	1	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	942	121	296	672	0	0	0	0	0	1162	273
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			0			0	
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
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Detector Phase		2	2	1	6					4	4	4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0	7.0	7.0
Minimum Split (s)		17.1	17.1	12.8	17.9					12.4	12.4	12.4
Total Split (s)		56.0	56.0	14.0	70.0					50.0	50.0	50.0
Total Split (%)		46.7%	46.7%	11.7%	58.3%					41.7%	41.7%	41.7%
Maximum Green (s)		50.9	50.9	8.2	64.1					44.6	44.6	44.6
Yellow Time (s)		4.1	4.1	3.0	4.9					4.2	4.2	4.2
All-Red Time (s)		1.0	1.0	2.8	1.0					1.2	1.2	1.2
Lost Time Adjust (s)		-0.1	-0.1	-0.8	-0.9						-0.4	-0.4
Total Lost Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		6.0	6.0	1.0	6.0					3.0	3.0	3.0
Minimum Gap (s)		3.2	3.2	1.0	3.2					1.0	1.0	1.0
Time Before Reduce (s)		15.0	15.0	0.0	15.0					0.0	0.0	0.0

Lanes, Volumes, Timings
1: I-540 EB/SB Ramp & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)		30.0	30.0	0.0	30.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Act Effect Green (s)		51.0	51.0	65.0	65.0						45.0	45.0
Actuated g/C Ratio		0.42	0.42	0.54	0.54						0.38	0.38
v/c Ratio		1.19	0.17	1.52	0.67						1.75	0.42
Control Delay		130.7	9.6	285.1	10.2						370.6	19.2
Queue Delay		2.5	0.0	0.0	0.0						2.3	0.0
Total Delay		133.2	9.6	285.1	10.2						373.0	19.2
LOS		F	A	F	B						F	B
Approach Delay		119.2			94.3						305.7	
Approach LOS		F			F						F	
Queue Length 50th (ft)		-880	21	-264	93						-1337	95
Queue Length 95th (ft)		#1130	58	#445	184						#1595	170
Internal Link Dist (ft)		1384			878			91			933	
Turn Bay Length (ft)			150	400								200
Base Capacity (vph)		791	715	195	1009						664	656
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		245	0	0	0						176	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.73	0.17	1.52	0.67						2.38	0.42

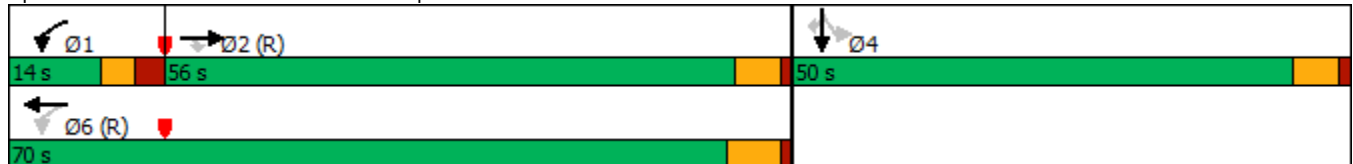
Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 23 (19%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.75
 Intersection Signal Delay: 189.4
 Intersection Capacity Utilization 170.1%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H



















- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: I-540 EB/SB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

No-Build (2028) AM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	620	0	0	1024	1134	69	0	208	0	0	0
Future Volume (vph)	235	620	0	0	1024	1134	69	0	208	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1743	1560	0	0	0
Flt Permitted	0.052							0.950				
Satd. Flow (perm)	97	1872	0	0	1853	1575	0	1743	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						435			231			
Link Speed (mph)		45			45			45				25
Link Distance (ft)		958			2221			1102				103
Travel Time (s)		14.5			33.7			16.7				2.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	261	689	0	0	1138	1260	77	0	231	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	689	0	0	1138	1260	0	77	231	0	0	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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	25.0	85.0			60.0	60.0	25.0	25.0	25.0			
Total Split (%)	22.7%	77.3%			54.5%	54.5%	22.7%	22.7%	22.7%			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.7	90.7			71.4	71.4		9.3	9.3			
Actuated g/C Ratio	0.82	0.82			0.65	0.65		0.08	0.08			

Lanes, Volumes, Timings
 2: I-540 WB/NB Ramp & Buffalo Road

No-Build (2028) AM
 Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.88	0.45			0.95	1.07		0.53	0.68			
Control Delay	48.0	4.3			22.5	50.0		60.8	16.5			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	48.0	4.3			22.5	50.0		60.8	16.5			
LOS	D	A			C	D		E	B			
Approach Delay		16.3			37.0			27.6				
Approach LOS		B			D			C				
Queue Length 50th (ft)	165	212			618	~597		53	0			
Queue Length 95th (ft)	m186	161			m557	m#449		99	73			
Internal Link Dist (ft)		878			2141			1022			23	
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	391	1544			1203	1175		316	472			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.67	0.45			0.95	1.07		0.24	0.49			

Intersection Summary



















Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 60 (55%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 30.8
 Intersection Capacity Utilization 101.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

No-Build (2028) PM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	1554	0	0	699	598	101	1	515	0	0	0
Future Volume (vph)	139	1554	0	0	699	598	101	1	515	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1749	1560	0	0	0
Flt Permitted	0.224							0.953				
Satd. Flow (perm)	419	1872	0	0	1853	1575	0	1749	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						410			78			
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		958			2221			1102			103	
Travel Time (s)		14.5			33.7			16.7			2.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	154	1727	0	0	777	664	112	1	572	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1727	0	0	777	664	0	113	572	0	0	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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Maximum Green (s)	9.2	89.2			74.6	74.6	19.7	19.7	19.7			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	1.0	6.0			6.0	6.0	1.0	1.0	1.0			
Minimum Gap (s)	0.2	3.0			3.0	3.0	0.2	0.2	0.2			

Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

No-Build (2028) PM
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0			15.0	15.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	30.0			30.0	30.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.0	90.0			77.1	77.1		20.0	20.0			
Actuated g/C Ratio	0.75	0.75			0.64	0.64		0.17	0.17			
v/c Ratio	0.38	1.23			0.65	0.57		0.39	1.76			
Control Delay	4.2	124.3			21.8	10.3		49.1	381.4			
Queue Delay	0.0	0.1			0.0	0.0		0.0	0.0			
Total Delay	4.2	124.4			21.8	10.3		49.1	381.4			
LOS	A	F			C	B		D	F			
Approach Delay		114.6			16.5			326.6				
Approach LOS		F			B			F				
Queue Length 50th (ft)	28	~1661			517	223		79	~613			
Queue Length 95th (ft)	m21	m734			m525	m248		138	#836			
Internal Link Dist (ft)		878			2141			1022				23
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	427	1404			1191	1158		291	325			
Starvation Cap Reductn	0	38			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.36	1.26			0.65	0.57		0.39	1.76			

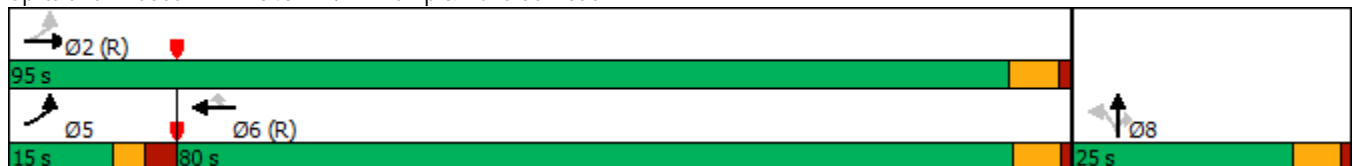
Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.76
 Intersection Signal Delay: 115.5
 Intersection Capacity Utilization 153.4%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



















Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) AM Brio Phase 1 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	621	0	0	1005	1121	69	0	199	0	0	0
Future Volume (vph)	235	621	0	0	1005	1121	69	0	199	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1743	1560	0	0	0
Flt Permitted	0.052							0.950				
Satd. Flow (perm)	97	1872	0	0	1853	1575	0	1743	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						438			221			
Link Speed (mph)		45			45			45				25
Link Distance (ft)		958			2221			1102				103
Travel Time (s)		14.5			33.7			16.7				2.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	261	690	0	0	1117	1246	77	0	221	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	690	0	0	1117	1246	0	77	221	0	0	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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	25.0	85.0			60.0	60.0	25.0	25.0	25.0			
Total Split (%)	22.7%	77.3%			54.5%	54.5%	22.7%	22.7%	22.7%			
Maximum Green (s)	19.2	79.2			54.6	54.6	19.7	19.7	19.7			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	1.0	6.0			6.0	6.0	1.0	1.0	1.0			
Minimum Gap (s)	0.2	3.0			3.0	3.0	0.2	0.2	0.2			

Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) AM Brio Phase 1 - No River Towne
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0			15.0	15.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	30.0			30.0	30.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.8	90.8			71.5	71.5		9.2	9.2			
Actuated g/C Ratio	0.83	0.83			0.65	0.65		0.08	0.08			
v/c Ratio	0.88	0.45			0.93	1.06		0.53	0.66			
Control Delay	48.9	4.4			21.5	44.3		61.0	16.6			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	48.9	4.4			21.5	44.3		61.0	16.6			
LOS	D	A			C	D		E	B			
Approach Delay		16.6			33.5			28.1				
Approach LOS		B			C			C				
Queue Length 50th (ft)	163	216			610	~536		53	0			
Queue Length 95th (ft)	m186	159			m560	m#491		100	72			
Internal Link Dist (ft)		878			2141			1022			23	
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	391	1544			1203	1176		316	464			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.67	0.45			0.93	1.06		0.24	0.48			

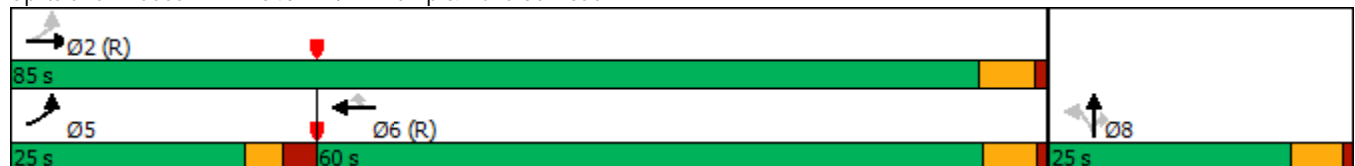
Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 60 (55%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 28.6
 Intersection Capacity Utilization 100.8%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service G

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



















Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	1543	0	0	686	589	101	1	485	0	0	0
Future Volume (vph)	139	1543	0	0	686	589	101	1	485	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1749	1560	0	0	0
Flt Permitted	0.232							0.953				
Satd. Flow (perm)	434	1872	0	0	1853	1575	0	1749	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						412			78			
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		958			2221			1102			103	
Travel Time (s)		14.5			33.7			16.7			2.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	154	1714	0	0	762	654	112	1	539	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1714	0	0	762	654	0	113	539	0	0	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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Maximum Green (s)	9.2	89.2			74.6	74.6	19.7	19.7	19.7			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	1.0	6.0			6.0	6.0	1.0	1.0	1.0			
Minimum Gap (s)	0.2	3.0			3.0	3.0	0.2	0.2	0.2			

Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1 - No River Towne
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0			15.0	15.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	30.0			30.0	30.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.0	90.0			77.1	77.1		20.0	20.0			
Actuated g/C Ratio	0.75	0.75			0.64	0.64		0.17	0.17			
v/c Ratio	0.37	1.22			0.64	0.56		0.39	1.66			
Control Delay	4.2	120.0			21.2	9.9		49.1	337.8			
Queue Delay	0.0	0.1			0.0	0.0		0.0	0.0			
Total Delay	4.2	120.1			21.2	9.9		49.1	337.8			
LOS	A	F			C	A		D	F			
Approach Delay		110.5			16.0			287.8				
Approach LOS		F			B			F				
Queue Length 50th (ft)	28	~1639			491	200		79	~559			
Queue Length 95th (ft)	m21	m727			m526	m244		138	#778			
Internal Link Dist (ft)		878			2141			1022				23
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	437	1404			1191	1159		291	325			
Starvation Cap Reductn	0	38			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.35	1.25			0.64	0.56		0.39	1.66			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.66
 Intersection Signal Delay: 105.9
 Intersection Capacity Utilization 150.4%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H



















- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) AM Brio Phase 1
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	646	0	0	1063	1179	69	0	210	0	0	0
Future Volume (vph)	235	646	0	0	1063	1179	69	0	210	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1743	1560	0	0	0
Flt Permitted	0.050							0.950				
Satd. Flow (perm)	94	1872	0	0	1853	1575	0	1743	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						532			233			
Link Speed (mph)		45			45			45				25
Link Distance (ft)		958			2221			1102				103
Travel Time (s)		14.5			33.7			16.7				2.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	261	718	0	0	1181	1310	77	0	233	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	718	0	0	1181	1310	0	77	233	0	0	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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Maximum Green (s)	9.2	89.2			74.6	74.6	19.7	19.7	19.7			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	1.0	6.0			6.0	6.0	1.0	1.0	1.0			
Minimum Gap (s)	0.2	3.0			3.0	3.0	0.2	0.2	0.2			

Lanes, Volumes, Timings
 2: I-540 WB/NB Ramp & Buffalo Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0			15.0	15.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	30.0			30.0	30.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	100.4	100.4			75.0	75.0		9.6	9.6			
Actuated g/C Ratio	0.84	0.84			0.62	0.62		0.08	0.08			
v/c Ratio	0.72	0.46			1.02	1.11		0.56	0.69			
Control Delay	36.8	5.2			44.4	72.6		67.9	17.6			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	36.8	5.2			44.4	72.6		67.9	17.6			
LOS	D	A			D	E		E	B			
Approach Delay		13.6			59.2			30.1				
Approach LOS		B			E			C				
Queue Length 50th (ft)	169	229			-992	-1023		59	0			
Queue Length 95th (ft)	#288	188			m657	m571		106	77			
Internal Link Dist (ft)		878			2141			1022			23	
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	365	1566			1158	1183		290	454			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.72	0.46			1.02	1.11		0.27	0.51			

Intersection Summary



















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 45.0
 Intersection Capacity Utilization 104.4%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	1636	0	0	725	628	101	1	522	0	0	0
Future Volume (vph)	139	1636	0	0	725	628	101	1	522	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1749	1560	0	0	0
Flt Permitted	0.208							0.953				
Satd. Flow (perm)	389	1872	0	0	1853	1575	0	1749	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						416			78			
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		958			2221			1102			103	
Travel Time (s)		14.5			33.7			16.7			2.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	154	1818	0	0	806	698	112	1	580	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1818	0	0	806	698	0	113	580	0	0	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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Maximum Green (s)	9.2	89.2			74.6	74.6	19.7	19.7	19.7			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	1.0	6.0			6.0	6.0	1.0	1.0	1.0			
Minimum Gap (s)	0.2	3.0			3.0	3.0	0.2	0.2	0.2			

Lanes, Volumes, Timings
 2: I-540 WB/NB Ramp & Buffalo Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0			15.0	15.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	30.0			30.0	30.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.0	90.0			77.1	77.1		20.0	20.0			
Actuated g/C Ratio	0.75	0.75			0.64	0.64		0.17	0.17			
v/c Ratio	0.40	1.29			0.68	0.60		0.39	1.78			
Control Delay	4.2	154.0			23.0	11.5		49.1	392.0			
Queue Delay	0.0	0.1			0.0	0.0		0.0	0.0			
Total Delay	4.2	154.0			23.0	11.5		49.1	392.0			
LOS	A	F			C	B		D	F			
Approach Delay		142.3			17.7			336.1				
Approach LOS		F			B			F				
Queue Length 50th (ft)	28	~1810			565	266		79	~626			
Queue Length 95th (ft)	m20	m738			m526	m259		138	#850			
Internal Link Dist (ft)		878			2141			1022				23
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	407	1404			1191	1160		291	325			
Starvation Cap Reductn	0	37			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.38	1.33			0.68	0.60		0.39	1.78			

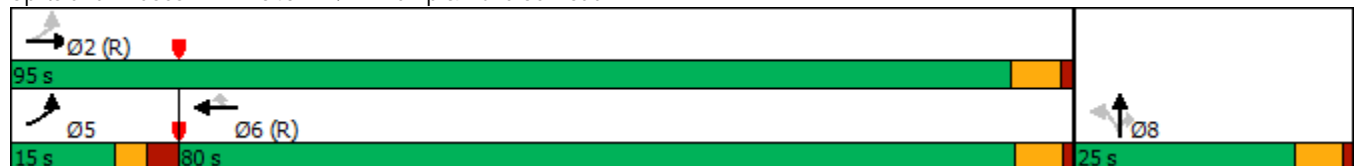
Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.78
 Intersection Signal Delay: 129.6
 Intersection Capacity Utilization 160.2%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H

- ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



















Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) AM Brio Ph 1+2 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	639	0	0	1023	1142	69	0	201	0	0	0
Future Volume (vph)	235	639	0	0	1023	1142	69	0	201	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1743	1560	0	0	0
Flt Permitted	0.052							0.950				
Satd. Flow (perm)	97	1872	0	0	1853	1575	0	1743	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						438			223			
Link Speed (mph)		45			45			45				25
Link Distance (ft)		958			2221			1102				103
Travel Time (s)		14.5			33.7			16.7				2.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	261	710	0	0	1137	1269	77	0	223	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	710	0	0	1137	1269	0	77	223	0	0	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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	25.0	85.0			60.0	60.0	25.0	25.0	25.0			
Total Split (%)	22.7%	77.3%			54.5%	54.5%	22.7%	22.7%	22.7%			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.8	90.8			71.4	71.4		9.2	9.2			
Actuated g/C Ratio	0.83	0.83			0.65	0.65		0.08	0.08			

Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

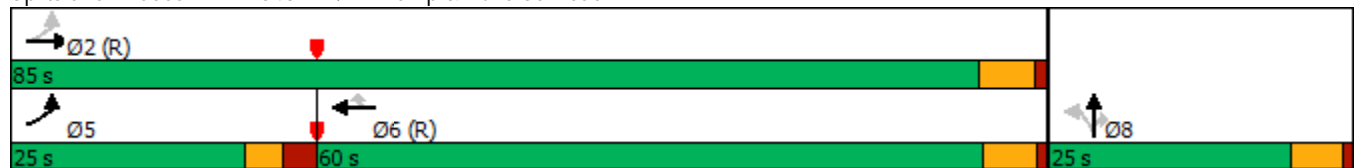
Build (2028) AM Brio Ph 1+2 - No River Towne
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.88	0.46			0.95	1.08		0.53	0.67			
Control Delay	47.3	4.4			22.4	53.0		60.9	16.6			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	47.3	4.4			22.4	53.0		60.9	16.6			
LOS	D	A			C	D		E	B			
Approach Delay		15.9			38.5			28.0				
Approach LOS		B			D			C				
Queue Length 50th (ft)	163	217			618	~649		53	0			
Queue Length 95th (ft)	m181	182			m553	m#491		100	72			
Internal Link Dist (ft)		878			2141			1022			23	
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	391	1544			1203	1176		316	466			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.67	0.46			0.95	1.08		0.24	0.48			

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 60 (55%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 31.7
 Intersection Capacity Utilization 102.1%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.



















Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1+2 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	1581	0	0	698	603	101	1	488	0	0	0
Future Volume (vph)	139	1581	0	0	698	603	101	1	488	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1749	1560	0	0	0
Flt Permitted	0.224							0.953				
Satd. Flow (perm)	419	1872	0	0	1853	1575	0	1749	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						414			78			
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		958			2221			1102			103	
Travel Time (s)		14.5			33.7			16.7			2.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	154	1757	0	0	776	670	112	1	542	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1757	0	0	776	670	0	113	542	0	0	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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.0	90.0			77.1	77.1		20.0	20.0			
Actuated g/C Ratio	0.75	0.75			0.64	0.64		0.17	0.17			

Lanes, Volumes, Timings
 2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1+2 - No River Towne

Brio Phasing Study

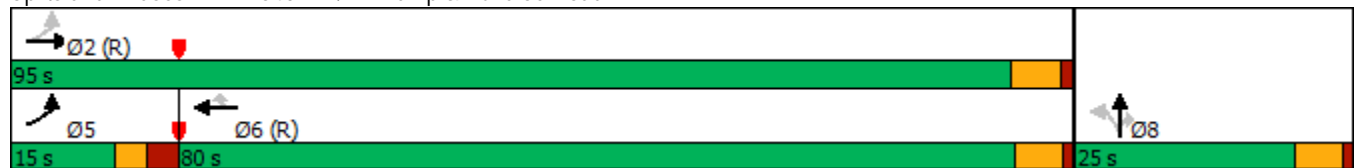
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.38	1.25			0.65	0.58		0.39	1.67			
Control Delay	4.2	134.0			21.7	10.4		49.1	341.8			
Queue Delay	0.0	0.1			0.0	0.0		0.0	0.0			
Total Delay	4.2	134.1			21.7	10.4		49.1	341.8			
LOS	A	F			C	B		D	F			
Approach Delay		123.6			16.5			291.3				
Approach LOS		F			B			F				
Queue Length 50th (ft)	28	~1710			514	228		79	~563			
Queue Length 95th (ft)	m21	m729			m524	m251		138	#785			
Internal Link Dist (ft)		878			2141			1022				23
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	427	1404			1191	1159		291	325			
Starvation Cap Reductn	0	37			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.36	1.29			0.65	0.58		0.39	1.67			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.67
 Intersection Signal Delay: 112.4
 Intersection Capacity Utilization 153.5%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: F
 ICU Level of Service H



















Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) AM Brio Phase 1+2

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	664	0	0	1081	1200	69	0	212	0	0	0
Future Volume (vph)	235	664	0	0	1081	1200	69	0	212	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1743	1560	0	0	0
Flt Permitted	0.050							0.950				
Satd. Flow (perm)	94	1872	0	0	1853	1575	0	1743	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						533			236			
Link Speed (mph)		45			45			45				25
Link Distance (ft)		958			2221			1102				103
Travel Time (s)		14.5			33.7			16.7				2.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	261	738	0	0	1201	1333	77	0	236	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	738	0	0	1201	1333	0	77	236	0	0	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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	100.4	100.4			75.0	75.0		9.6	9.6			
Actuated g/C Ratio	0.84	0.84			0.62	0.62		0.08	0.08			

Lanes, Volumes, Timings
 2: I-540 WB/NB Ramp & Buffalo Road

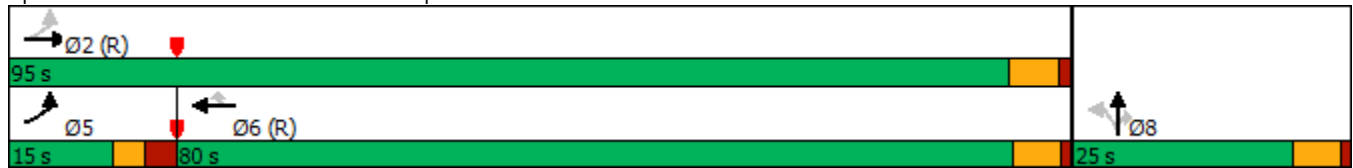
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.72	0.47			1.04	1.13		0.55	0.69			
Control Delay	36.2	5.2			51.1	81.3		67.7	17.6			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	36.2	5.2			51.1	81.3		67.7	17.6			
LOS	D	A			D	F		E	B			
Approach Delay		13.3			67.0			29.9				
Approach LOS		B			E			C				
Queue Length 50th (ft)	167	241			~1026	~1134		59	0			
Queue Length 95th (ft)	#288	208			m659	m577		106	77			
Internal Link Dist (ft)		878			2141			1022			23	
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	365	1566			1158	1184		290	456			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.72	0.47			1.04	1.13		0.27	0.52			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 50.0
 Intersection Capacity Utilization 105.7%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service G



















- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) PM Brio Phase 1+2
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	1674	0	0	737	642	101	1	525	0	0	0
Future Volume (vph)	139	1674	0	0	737	642	101	1	525	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1749	1560	0	0	0
Flt Permitted	0.201							0.953				
Satd. Flow (perm)	376	1872	0	0	1853	1575	0	1749	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						418			78			
Link Speed (mph)		45			45			45				25
Link Distance (ft)		958			2221			1102				103
Travel Time (s)		14.5			33.7			16.7				2.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	154	1860	0	0	819	713	112	1	583	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1860	0	0	819	713	0	113	583	0	0	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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.0	90.0			77.1	77.1		20.0	20.0			
Actuated g/C Ratio	0.75	0.75			0.64	0.64		0.17	0.17			

Lanes, Volumes, Timings
 2: I-540 WB/NB Ramp & Buffalo Road

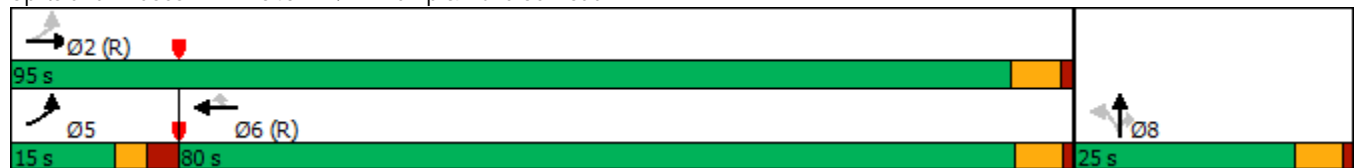
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.41	1.32			0.69	0.61		0.39	1.79			
Control Delay	4.3	167.6			23.6	12.2		49.1	395.9			
Queue Delay	0.0	0.1			0.0	0.0		0.0	0.0			
Total Delay	4.3	167.7			23.6	12.2		49.1	395.9			
LOS	A	F			C	B		D	F			
Approach Delay		155.2			18.3			339.6				
Approach LOS		F			B			F				
Queue Length 50th (ft)	28	~1879			589	280		79	~631			
Queue Length 95th (ft)	m19	m739			m529	m265		138	#857			
Internal Link Dist (ft)		878			2141			1022				23
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	398	1404			1191	1161		291	325			
Starvation Cap Reductn	0	36			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.39	1.36			0.69	0.61		0.39	1.79			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.79
 Intersection Signal Delay: 136.0
 Intersection Capacity Utilization 163.3%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.



















Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	698	0	0	1100	1222	69	0	214	0	0	0
Future Volume (vph)	235	698	0	0	1100	1222	69	0	214	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1743	1560	0	0	0
Flt Permitted	0.050							0.950				
Satd. Flow (perm)	94	1872	0	0	1853	1575	0	1743	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						533			238			
Link Speed (mph)		45			45			45				25
Link Distance (ft)		958			2221			1102				103
Travel Time (s)		14.5			33.7			16.7				2.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	261	776	0	0	1222	1358	77	0	238	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	776	0	0	1222	1358	0	77	238	0	0	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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	100.4	100.4			75.0	75.0		9.6	9.6			
Actuated g/C Ratio	0.84	0.84			0.62	0.62		0.08	0.08			

Lanes, Volumes, Timings
 2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)

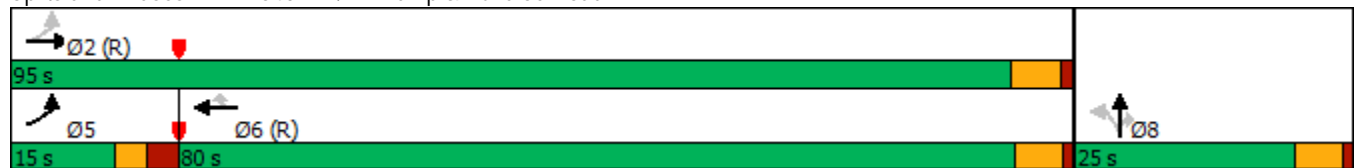
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.72	0.50			1.06	1.15		0.55	0.69			
Control Delay	35.8	5.1			58.7	91.1		67.7	17.6			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	35.8	5.1			58.7	91.1		67.7	17.6			
LOS	D	A			E	F		E	B			
Approach Delay		12.8			75.8			29.8				
Approach LOS		B			E			C				
Queue Length 50th (ft)	161	247			~1061	~1229		59	0			
Queue Length 95th (ft)	m#281	242			m661	m581		106	78			
Internal Link Dist (ft)		878			2141			1022			23	
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	365	1566			1158	1184		290	458			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.72	0.50			1.06	1.15		0.27	0.52			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 55.5
 Intersection Capacity Utilization 107.0%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.



















Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	1749	0	0	770	681	101	1	531	0	0	0
Future Volume (vph)	139	1749	0	0	770	681	101	1	531	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			3%			0%	
Storage Length (ft)	300		0	0		125	0		100	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1778	1872	0	0	1853	1575	0	1749	1560	0	0	0
Flt Permitted	0.181							0.953				
Satd. Flow (perm)	339	1872	0	0	1853	1575	0	1749	1560	0	0	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						424			78			
Link Speed (mph)		45			45			45				25
Link Distance (ft)		958			2221			1102				103
Travel Time (s)		14.5			33.7			16.7				2.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	154	1943	0	0	856	757	112	1	590	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1943	0	0	856	757	0	113	590	0	0	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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	12.8	17.8			17.4	17.4	12.3	12.3	12.3			
Total Split (s)	15.0	95.0			80.0	80.0	25.0	25.0	25.0			
Total Split (%)	12.5%	79.2%			66.7%	66.7%	20.8%	20.8%	20.8%			
Maximum Green (s)	9.2	89.2			74.6	74.6	19.7	19.7	19.7			
Yellow Time (s)	3.0	4.6			4.4	4.4	4.3	4.3	4.3			
All-Red Time (s)	2.8	1.2			1.0	1.0	1.0	1.0	1.0			
Lost Time Adjust (s)	-0.8	-0.8			-0.4	-0.4		-0.3	-0.3			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	1.0	6.0			6.0	6.0	1.0	1.0	1.0			
Minimum Gap (s)	0.2	3.0			3.0	3.0	0.2	0.2	0.2			

Lanes, Volumes, Timings
2: I-540 WB/NB Ramp & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0			15.0	15.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	30.0			30.0	30.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Act Effct Green (s)	90.0	90.0			77.1	77.1		20.0	20.0			
Actuated g/C Ratio	0.75	0.75			0.64	0.64		0.17	0.17			
v/c Ratio	0.44	1.38			0.72	0.65		0.39	1.82			
Control Delay	4.4	194.4			25.3	14.1		49.1	405.2			
Queue Delay	0.0	0.1			0.0	0.0		0.0	0.0			
Total Delay	4.4	194.5			25.3	14.1		49.1	405.2			
LOS	A	F			C	B		D	F			
Approach Delay		180.6			20.0			348.0				
Approach LOS		F			C			F				
Queue Length 50th (ft)	28	~2016			631	343		79	~642			
Queue Length 95th (ft)	m19	m743			m533	m280		138	#868			
Internal Link Dist (ft)		878			2141			1022				23
Turn Bay Length (ft)	300					125			100			
Base Capacity (vph)	374	1404			1191	1163		291	325			
Starvation Cap Reductn	0	35			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.41	1.42			0.72	0.65		0.39	1.82			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.82
 Intersection Signal Delay: 148.5
 Intersection Capacity Utilization 170.1%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H






















- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 WB/NB Ramp & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

No-Build (2028) AM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	352	128	107	913	17	300	91	39	25	148	626
Future Volume (vph)	296	352	128	107	913	17	300	91	39	25	148	626
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.960			0.997			0.955				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1788	0	1770	1857	0	1770	1779	0	1770	1863	1583
Flt Permitted	0.078			0.398			0.290			0.611		
Satd. Flow (perm)	145	1788	0	741	1857	0	540	1779	0	1138	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35			1			18				85
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	329	391	142	119	1014	19	333	101	43	28	164	696
Shared Lane Traffic (%)												
Lane Group Flow (vph)	329	533	0	119	1033	0	333	144	0	28	164	696
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	26.0	78.0		78.0	52.0		18.0	32.0		32.0	14.0	26.0
Total Split (%)	23.6%	70.9%		70.9%	47.3%		16.4%	29.1%		29.1%	12.7%	23.6%
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.5		-1.5	-1.5		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	73.0	73.0		73.0	47.0		27.0	27.0		27.0	9.0	35.0
Actuated g/C Ratio	0.66	0.66		0.66	0.43		0.25	0.25		0.25	0.08	0.32
v/c Ratio	0.81	0.44		0.24	1.30		1.20	0.32		0.10	1.08	1.24

Lanes, Volumes, Timings
 3: Forestville Road & Buffalo Road

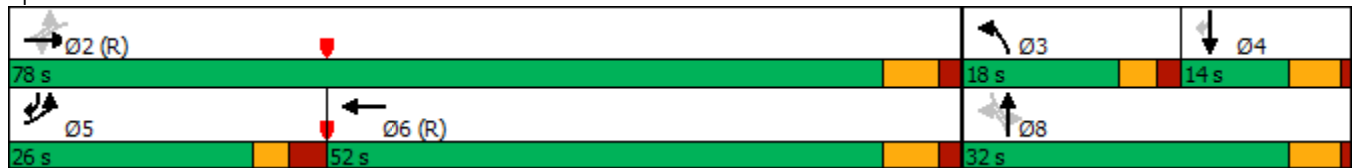
No-Build (2028) AM
 Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	45.8	10.3		8.9	173.9		155.4	31.9		33.4	143.9	153.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	45.8	10.3		8.9	173.9		155.4	31.9		33.4	143.9	153.0
LOS	D	B		A	F		F	C		C	F	F
Approach Delay		23.9			156.8			118.1			147.6	
Approach LOS		C			F			F			F	
Queue Length 50th (ft)	196	212		31	-943		-234	73		15	-129	-571
Queue Length 95th (ft)	#311	218		59	#1196		#413	130		40	#266	#802
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	406	1198		491	794		277	450		279	152	561
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.44		0.24	1.30		1.20	0.32		0.10	1.08	1.24

Intersection Summary






















Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 55 (50%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 115.0
 Intersection Capacity Utilization 117.0%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

No-Build (2028) PM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	652	928	222	96	549	28	162	169	52	49	160	388
Future Volume (vph)	652	928	222	96	549	28	162	169	52	49	160	388
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.971			0.993			0.965				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1809	0	1770	1850	0	1770	1798	0	1770	1863	1583
Flt Permitted	0.096			0.050			0.267			0.409		
Satd. Flow (perm)	179	1809	0	93	1850	0	497	1798	0	762	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			2			12				94
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	724	1031	247	107	610	31	180	188	58	54	178	431
Shared Lane Traffic (%)												
Lane Group Flow (vph)	724	1278	0	107	641	0	180	246	0	54	178	431
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Maximum Green (s)	35.9	77.5		77.5	35.5		8.9	30.7		30.7	16.7	35.9
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Vehicle Extension (s)	2.0	6.0		6.0	6.0		2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0		15.0	15.0		0.0	0.0		0.0	0.0	0.0

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

No-Build (2028) PM
Brio Phasing Study

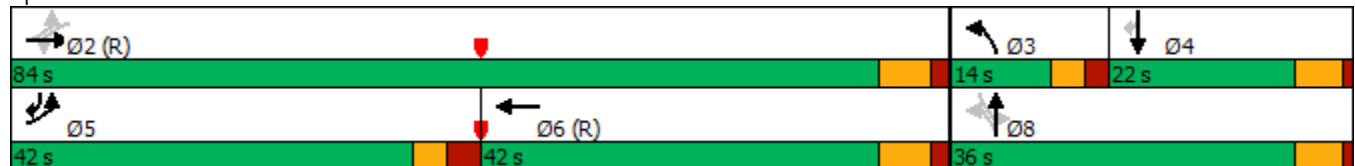
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0		30.0	30.0		0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.1	80.7		80.7	36.6		28.9	28.9		28.9	14.9	59.0
Actuated g/C Ratio	0.68	0.67		0.67	0.30		0.24	0.24		0.24	0.12	0.49
v/c Ratio	1.13	1.04		1.73	1.13		0.84	0.56		0.30	0.77	0.52
Control Delay	94.8	42.8		407.4	119.3		70.8	42.8		41.3	72.6	18.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	94.8	42.8		407.4	119.3		70.8	42.8		41.3	72.6	18.5
LOS	F	D		F	F		E	D		D	E	B
Approach Delay		61.6			160.5			54.7			34.9	
Approach LOS		E			F			D			C	
Queue Length 50th (ft)	~618	~1085		~76	~578		117	157		34	134	172
Queue Length 95th (ft)	m339	m449		#196	#809		#182	240		72	#215	266
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	639	1223		62	565		215	473		196	263	826
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.13	1.04		1.73	1.13		0.84	0.52		0.28	0.68	0.52

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.73
 Intersection Signal Delay: 75.5
 Intersection Capacity Utilization 107.6%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.






















Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) AM Brio Phase 1 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	344	128	99	881	9	300	91	36	22	148	626
Future Volume (vph)	296	344	128	99	881	9	300	91	36	22	148	626
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.959			0.998			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1786	0	1770	1859	0	1770	1783	0	1770	1863	1583
Flt Permitted	0.078			0.404			0.290			0.616		
Satd. Flow (perm)	145	1786	0	753	1859	0	540	1783	0	1147	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			1			17				85
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	329	382	142	110	979	10	333	101	40	24	164	696
Shared Lane Traffic (%)												
Lane Group Flow (vph)	329	524	0	110	989	0	333	141	0	24	164	696
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	26.0	78.0		78.0	52.0		18.0	32.0		32.0	14.0	26.0
Total Split (%)	23.6%	70.9%		70.9%	47.3%		16.4%	29.1%		29.1%	12.7%	23.6%
Maximum Green (s)	19.9	71.5		71.5	45.5		12.9	26.7		26.7	8.7	19.9
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.5		-1.5	-1.5		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Vehicle Extension (s)	2.0	6.0		6.0	6.0		2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0		15.0	15.0		0.0	0.0		0.0	0.0	0.0

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) AM Brio Phase 1 - No River Towne
Brio Phasing Study

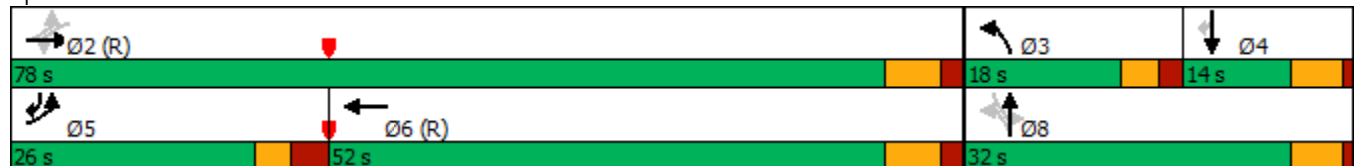
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0		30.0	30.0		0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	73.0	73.0		73.0	47.0		27.0	27.0		27.0	9.0	35.0
Actuated g/C Ratio	0.66	0.66		0.66	0.43		0.25	0.25		0.25	0.08	0.32
v/c Ratio	0.81	0.44		0.22	1.25		1.20	0.31		0.09	1.08	1.24
Control Delay	46.2	10.2		8.6	150.8		155.4	32.0		33.1	143.9	153.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	46.2	10.2		8.6	150.8		155.4	32.0		33.1	143.9	153.0
LOS	D	B		A	F		F	C		C	F	F
Approach Delay		24.1			136.6			118.7			148.1	
Approach LOS		C			F			F			F	
Queue Length 50th (ft)	196	208		28	-876		-234	71		13	-129	-571
Queue Length 95th (ft)	#311	214		54	#1128		#413	129		36	#266	#802
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	406	1197		499	794		277	450		281	152	561
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.44		0.22	1.25		1.20	0.31		0.09	1.08	1.24

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 55 (50%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25
 Intersection Signal Delay: 108.1
 Intersection Capacity Utilization 114.8%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H






















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) PM Brio Phase 1 - No River Towne
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	652	886	222	91	526	23	162	169	43	40	160	388
Future Volume (vph)	652	886	222	91	526	23	162	169	43	40	160	388
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.970			0.994			0.969				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1807	0	1770	1852	0	1770	1805	0	1770	1863	1583
Flt Permitted	0.096			0.050			0.267			0.427		
Satd. Flow (perm)	179	1807	0	93	1852	0	497	1805	0	795	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			2			10				102
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	724	984	247	101	584	26	180	188	48	44	178	431
Shared Lane Traffic (%)												
Lane Group Flow (vph)	724	1231	0	101	610	0	180	236	0	44	178	431
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Maximum Green (s)	35.9	77.5		77.5	35.5		8.9	30.7		30.7	16.7	35.9
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Vehicle Extension (s)	2.0	6.0		6.0	6.0		2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0		15.0	15.0		0.0	0.0		0.0	0.0	0.0

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) PM Brio Phase 1 - No River Towne
Brio Phasing Study

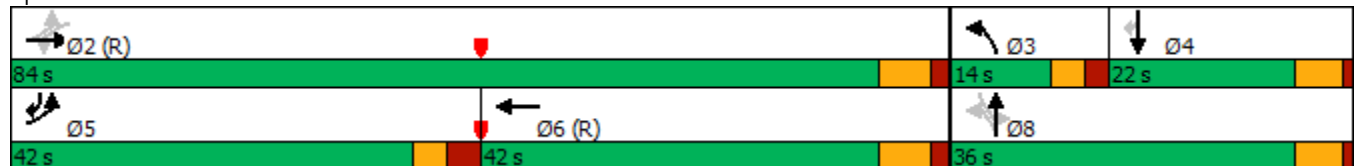
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0		30.0	30.0		0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.1	80.7		80.7	36.6		28.9	28.9		28.9	14.9	59.0
Actuated g/C Ratio	0.68	0.67		0.67	0.30		0.24	0.24		0.24	0.12	0.49
v/c Ratio	1.13	1.01		1.63	1.08		0.84	0.53		0.23	0.77	0.52
Control Delay	94.9	28.9		367.8	100.5		70.8	42.4		39.2	72.6	18.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	94.9	28.9		367.8	100.5		70.8	42.4		39.2	72.6	18.1
LOS	F	C		F	F		E	D		D	E	B
Approach Delay		53.3			138.4			54.7			34.3	
Approach LOS		D			F			D			C	
Queue Length 50th (ft)	~619	~1010		-66	-527		117	151		27	134	167
Queue Length 95th (ft)	m351	m424		#185	#756		#182	231		61	#215	261
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	639	1222		62	566		215	473		205	263	830
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.13	1.01		1.63	1.08		0.84	0.50		0.21	0.68	0.52

Intersection Summary






















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.63
 Intersection Signal Delay: 66.4
 Intersection Capacity Utilization 104.9%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	380	128	107	997	17	300	91	39	25	148	626
Future Volume (vph)	296	380	128	107	997	17	300	91	39	25	148	626
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.962			0.997			0.955				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1792	0	1770	1857	0	1770	1779	0	1770	1863	1583
Flt Permitted	0.092			0.384			0.291			0.595		
Satd. Flow (perm)	171	1792	0	715	1857	0	542	1779	0	1108	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			1			17				78
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	329	422	142	119	1108	19	333	101	43	28	164	696
Shared Lane Traffic (%)												
Lane Group Flow (vph)	329	564	0	119	1127	0	333	144	0	28	164	696
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Maximum Green (s)	35.9	77.5		77.5	35.5		8.9	30.7		30.7	16.7	35.9
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Vehicle Extension (s)	2.0	6.0		6.0	6.0		2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0		15.0	15.0		0.0	0.0		0.0	0.0	0.0

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0		30.0	30.0		0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.7	81.3		81.3	38.7		28.3	28.3		28.3	14.3	56.9
Actuated g/C Ratio	0.68	0.68		0.68	0.32		0.24	0.24		0.24	0.12	0.47
v/c Ratio	0.53	0.46		0.25	1.88		1.51	0.33		0.11	0.74	0.88
Control Delay	22.2	13.2		9.6	428.8		286.0	35.0		35.8	70.5	38.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.2	13.2		9.6	428.8		286.0	35.0		35.8	70.5	38.9
LOS	C	B		A	F		F	C		D	E	D
Approach Delay		16.5			388.7			210.2			44.6	
Approach LOS		B			F			F			D	
Queue Length 50th (ft)	157	250		33	~1374		~281	81		17	123	416
Queue Length 95th (ft)	210	338		66	#1635		#533	138		42	196	#664
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	622	1223		484	599		220	472		286	263	796
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.53	0.46		0.25	1.88		1.51	0.31		0.10	0.62	0.87

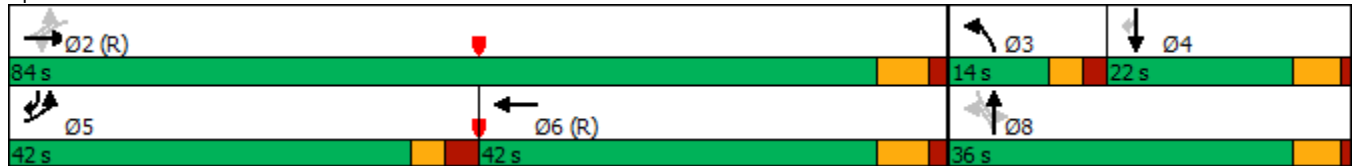
Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.88
 Intersection Signal Delay: 182.4
 Intersection Capacity Utilization 121.7%
 Analysis Period (min) 15






















Intersection LOS: F
 ICU Level of Service H

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	652	1016	222	96	604	28	162	169	52	49	160	388
Future Volume (vph)	652	1016	222	96	604	28	162	169	52	49	160	388
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.973			0.993			0.965				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1812	0	1770	1850	0	1770	1798	0	1770	1863	1583
Flt Permitted	0.096			0.050			0.267			0.409		
Satd. Flow (perm)	179	1812	0	93	1850	0	497	1798	0	762	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			2			12				79
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	724	1129	247	107	671	31	180	188	58	54	178	431
Shared Lane Traffic (%)												
Lane Group Flow (vph)	724	1376	0	107	702	0	180	246	0	54	178	431
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Maximum Green (s)	35.9	77.5		77.5	35.5		8.9	30.7		30.7	16.7	35.9
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Vehicle Extension (s)	2.0	6.0		6.0	6.0		2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0		15.0	15.0		0.0	0.0		0.0	0.0	0.0

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

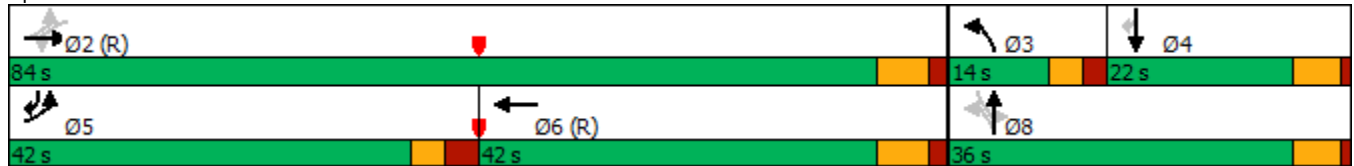
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0		30.0	30.0		0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.1	80.7		80.7	36.6		28.9	28.9		28.9	14.9	59.0
Actuated g/C Ratio	0.68	0.67		0.67	0.30		0.24	0.24		0.24	0.12	0.49
v/c Ratio	1.13	1.12		1.73	1.24		0.84	0.56		0.30	0.77	0.53
Control Delay	94.9	77.3		407.4	159.9		70.8	42.8		41.3	72.6	19.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	94.9	77.3		407.4	159.9		70.8	42.8		41.3	72.6	19.5
LOS	F	E		F	F		E	D		D	E	B
Approach Delay		83.4			192.6			54.7			35.5	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	~618	~1245		~76	~678		117	157		34	134	180
Queue Length 95th (ft)	m316	m479		#196	#916		#182	240		72	#215	276
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	639	1224		62	565		215	473		196	263	818
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.13	1.12		1.73	1.24		0.84	0.52		0.28	0.68	0.53

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.73
 Intersection Signal Delay: 94.5
 Intersection Capacity Utilization 112.2%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H






















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) AM Brio Ph 1+2 - No River Towne
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	364	128	99	920	9	300	91	36	22	148	626
Future Volume (vph)	296	364	128	99	920	9	300	91	36	22	148	626
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.961			0.999			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1790	0	1770	1861	0	1770	1783	0	1770	1863	1583
Flt Permitted	0.078			0.390			0.290			0.616		
Satd. Flow (perm)	145	1790	0	726	1861	0	540	1783	0	1147	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			1			17				85
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	329	404	142	110	1022	10	333	101	40	24	164	696
Shared Lane Traffic (%)												
Lane Group Flow (vph)	329	546	0	110	1032	0	333	141	0	24	164	696
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	26.0	78.0		78.0	52.0		18.0	32.0		32.0	14.0	26.0
Total Split (%)	23.6%	70.9%		70.9%	47.3%		16.4%	29.1%		29.1%	12.7%	23.6%
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.5		-1.5	-1.5		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	73.0	73.0		73.0	47.0		27.0	27.0		27.0	9.0	35.0
Actuated g/C Ratio	0.66	0.66		0.66	0.43		0.25	0.25		0.25	0.08	0.32
v/c Ratio	0.81	0.46		0.23	1.30		1.20	0.31		0.09	1.08	1.24

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

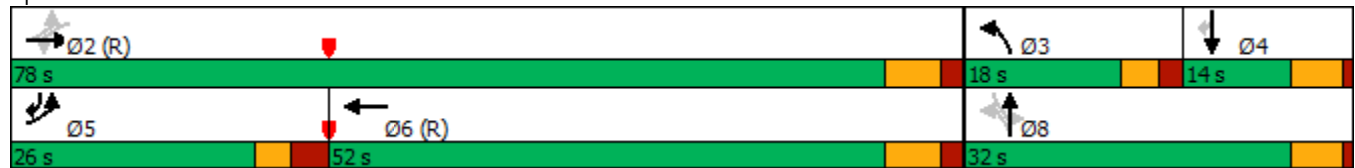
Build (2028) AM Brio Ph 1+2 - No River Towne
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	46.1	10.3		8.8	172.6		155.4	32.0		33.1	143.9	153.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	46.1	10.3		8.8	172.6		155.4	32.0		33.1	143.9	153.0
LOS	D	B		A	F		F	C		C	F	F
Approach Delay		23.8			156.9			118.7			148.1	
Approach LOS		C			F			F			F	
Queue Length 50th (ft)	197	218		28	-940		-234	71		13	-129	-571
Queue Length 95th (ft)	#311	220		55	#1194		#413	129		36	#266	#802
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	406	1199		481	795		277	450		281	152	561
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.46		0.23	1.30		1.20	0.31		0.09	1.08	1.24

Intersection Summary






















Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 55 (50%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 114.7
 Intersection Capacity Utilization 116.8%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) PM Brio Phase 1+2 - No River Towne
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	652	928	222	91	552	23	162	169	43	40	160	388
Future Volume (vph)	652	928	222	91	552	23	162	169	43	40	160	388
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.971			0.994			0.969				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1809	0	1770	1852	0	1770	1805	0	1770	1863	1583
Flt Permitted	0.096			0.050			0.267			0.427		
Satd. Flow (perm)	179	1809	0	93	1852	0	497	1805	0	795	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			2			10				93
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	724	1031	247	101	613	26	180	188	48	44	178	431
Shared Lane Traffic (%)												
Lane Group Flow (vph)	724	1278	0	101	639	0	180	236	0	44	178	431
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.1	80.7		80.7	36.6		28.9	28.9		28.9	14.9	59.0
Actuated g/C Ratio	0.68	0.67		0.67	0.30		0.24	0.24		0.24	0.12	0.49
v/c Ratio	1.13	1.04		1.63	1.13		0.84	0.53		0.23	0.77	0.52

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) PM Brio Phase 1+2 - No River Towne

Brio Phasing Study

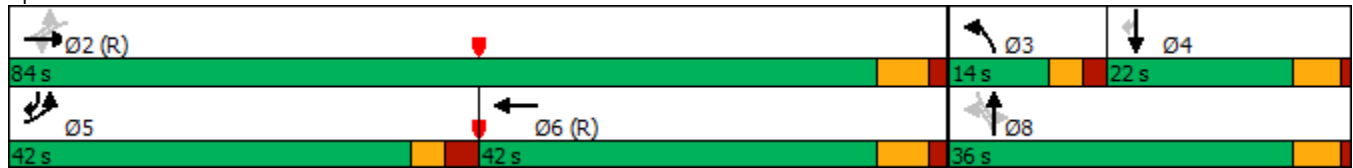
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	95.0	42.5		367.8	117.4		70.8	42.4		39.2	72.6	18.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	95.0	42.5		367.8	117.4		70.8	42.4		39.2	72.6	18.6
LOS	F	D		F	F		E	D		D	E	B
Approach Delay		61.5			151.6			54.7			34.7	
Approach LOS		E			F			D			C	
Queue Length 50th (ft)	~618	~1084		-66	-574		117	151		27	134	172
Queue Length 95th (ft)	m339	m438		#185	#806		#182	231		61	#215	267
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	639	1223		62	566		215	473		205	263	825
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.13	1.04		1.63	1.13		0.84	0.50		0.21	0.68	0.52

Intersection Summary






















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.63
 Intersection Signal Delay: 73.6
 Intersection Capacity Utilization 107.1%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	400	128	107	1036	17	300	91	39	25	148	626
Future Volume (vph)	296	400	128	107	1036	17	300	91	39	25	148	626
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.964			0.998			0.955				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1796	0	1770	1859	0	1770	1779	0	1770	1863	1583
Flt Permitted	0.092			0.371			0.291			0.595		
Satd. Flow (perm)	171	1796	0	691	1859	0	542	1779	0	1108	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			1			17				78
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	329	444	142	119	1151	19	333	101	43	28	164	696
Shared Lane Traffic (%)												
Lane Group Flow (vph)	329	586	0	119	1170	0	333	144	0	28	164	696
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.7	81.3		81.3	38.7		28.3	28.3		28.3	14.3	56.9
Actuated g/C Ratio	0.68	0.68		0.68	0.32		0.24	0.24		0.24	0.12	0.47
v/c Ratio	0.53	0.48		0.25	1.95		1.51	0.33		0.11	0.74	0.88

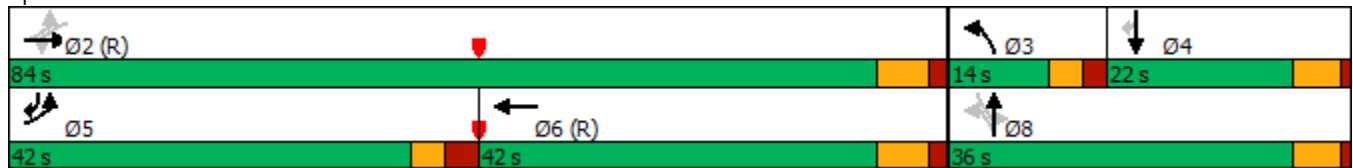
Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	21.7	13.4		9.8	459.7		286.0	35.0		35.8	70.5	38.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.7	13.4		9.8	459.7		286.0	35.0		35.8	70.5	38.9
LOS	C	B		A	F		F	C		D	E	D
Approach Delay		16.4			418.2			210.2			44.6	
Approach LOS		B			F			F			D	
Queue Length 50th (ft)	155	277		34	~1444		~281	81		17	123	416
Queue Length 95th (ft)	204	350		67	#1707		#533	138		42	196	#664
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	622	1225		467	600		220	472		286	263	796
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.53	0.48		0.25	1.95		1.51	0.31		0.10	0.62	0.87






















Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.95
 Intersection Signal Delay: 194.4
 Intersection Capacity Utilization 123.8%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	652	1058	222	96	630	28	162	169	52	49	160	388
Future Volume (vph)	652	1058	222	96	630	28	162	169	52	49	160	388
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.974			0.994			0.965				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1814	0	1770	1852	0	1770	1798	0	1770	1863	1583
Flt Permitted	0.096			0.050			0.267			0.409		
Satd. Flow (perm)	179	1814	0	93	1852	0	497	1798	0	762	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			2			12				78
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	724	1176	247	107	700	31	180	188	58	54	178	431
Shared Lane Traffic (%)												
Lane Group Flow (vph)	724	1423	0	107	731	0	180	246	0	54	178	431
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.1	80.7		80.7	36.6		28.9	28.9		28.9	14.9	59.0
Actuated g/C Ratio	0.68	0.67		0.67	0.30		0.24	0.24		0.24	0.12	0.49
v/c Ratio	1.13	1.16		1.73	1.29		0.84	0.56		0.30	0.77	0.53

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

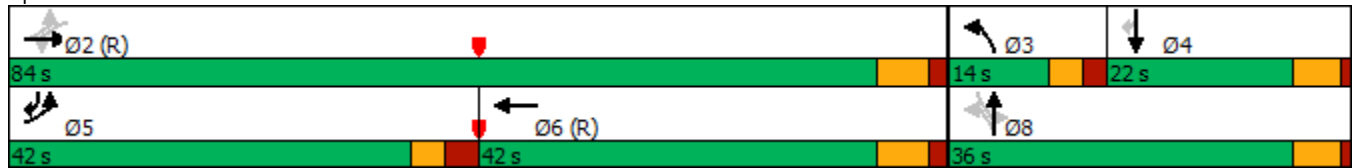
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	94.9	94.1		407.4	179.4		70.8	42.8		41.3	72.6	19.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	94.9	94.1		407.4	179.4		70.8	42.8		41.3	72.6	19.5
LOS	F	F		F	F		E	D		D	E	B
Approach Delay		94.4			208.5			54.7			35.6	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	~617	~1321		~76	~725		117	157		34	134	181
Queue Length 95th (ft)	m305	m494		#196	#966		#182	240		72	#215	276
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	639	1225		62	566		215	473		196	263	817
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.13	1.16		1.73	1.29		0.84	0.52		0.28	0.68	0.53

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.73
 Intersection Signal Delay: 104.1
 Intersection Capacity Utilization 114.4%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H






















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	436	128	107	1078	17	300	91	39	25	148	626
Future Volume (vph)	296	436	128	107	1078	17	300	91	39	25	148	626
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.966			0.998			0.955				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1799	0	1770	1859	0	1770	1779	0	1770	1863	1583
Flt Permitted	0.092			0.347			0.291			0.595		
Satd. Flow (perm)	171	1799	0	646	1859	0	542	1779	0	1108	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			1			17				78
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	329	484	142	119	1198	19	333	101	43	28	164	696
Shared Lane Traffic (%)												
Lane Group Flow (vph)	329	626	0	119	1217	0	333	144	0	28	164	696
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.7	81.3		81.3	38.7		28.3	28.3		28.3	14.3	56.9
Actuated g/C Ratio	0.68	0.68		0.68	0.32		0.24	0.24		0.24	0.12	0.47
v/c Ratio	0.53	0.51		0.27	2.03		1.51	0.33		0.11	0.74	0.88

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)

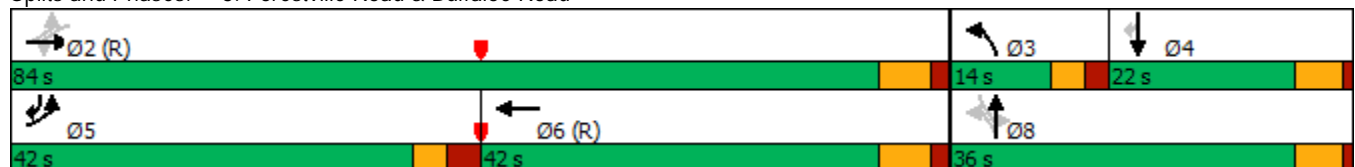
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	21.0	13.8		10.2	494.0		286.0	35.0		35.8	70.5	38.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.0	13.8		10.2	494.0		286.0	35.0		35.8	70.5	38.9
LOS	C	B		B	F		F	C		D	E	D
Approach Delay		16.3			450.9			210.2			44.6	
Approach LOS		B			F			F			D	
Queue Length 50th (ft)	151	334		34	~1521		~281	81		17	123	416
Queue Length 95th (ft)	193	383		69	#1785		#533	138		42	196	#664
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	622	1226		437	600		220	472		286	263	796
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.53	0.51		0.27	2.03		1.51	0.31		0.10	0.62	0.87

Intersection Summary






















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.03
 Intersection Signal Delay: 207.3
 Intersection Capacity Utilization 126.0%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	652	1138	222	96	702	28	162	169	52	49	160	388
Future Volume (vph)	652	1138	222	96	702	28	162	169	52	49	160	388
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	200		0	225		0	225		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.975			0.994			0.965				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1816	0	1770	1852	0	1770	1798	0	1770	1863	1583
Flt Permitted	0.096			0.050			0.267			0.409		
Satd. Flow (perm)	179	1816	0	93	1852	0	497	1798	0	762	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			2			12				78
Link Speed (mph)		45			45			45				45
Link Distance (ft)		2221			2261			1163			1283	
Travel Time (s)		33.7			34.3			17.6			19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	724	1264	247	107	780	31	180	188	58	54	178	431
Shared Lane Traffic (%)												
Lane Group Flow (vph)	724	1511	0	107	811	0	180	246	0	54	178	431
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			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
Turn Type	pm+pt	NA		D.Pm	NA		pm+pt	NA		D.Pm	NA	pm+ov
Protected Phases	5	2			6		3	8			4	5
Permitted Phases	2			2			8			8		4
Detector Phase	5	2		2	6		3	8		8	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.1	18.5		18.5	18.5		12.1	12.3		12.3	12.3	13.1
Total Split (s)	42.0	84.0		84.0	42.0		14.0	36.0		36.0	22.0	42.0
Total Split (%)	35.0%	70.0%		70.0%	35.0%		11.7%	30.0%		30.0%	18.3%	35.0%
Maximum Green (s)	35.9	77.5		77.5	35.5		8.9	30.7		30.7	16.7	35.9
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.3		4.3	4.3	3.0
All-Red Time (s)	3.1	1.9		1.9	1.9		2.1	1.0		1.0	1.0	3.1
Lost Time Adjust (s)	-1.1	-1.1		-1.1	-1.1		-0.1	-0.3		-0.3	-0.3	-1.1
Total Lost Time (s)	5.0	5.4		5.4	5.4		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead				Lag		Lead				Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes				Yes	Yes
Vehicle Extension (s)	2.0	6.0		6.0	6.0		2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0		15.0	15.0		0.0	0.0		0.0	0.0	0.0

Lanes, Volumes, Timings
3: Forestville Road & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)

Brio Phasing Study

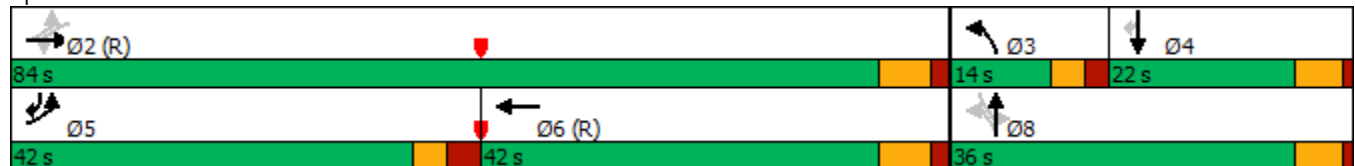
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0		30.0	30.0		0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	None
Act Effect Green (s)	81.1	80.7		80.7	36.6		28.9	28.9		28.9	14.9	59.0
Actuated g/C Ratio	0.68	0.67		0.67	0.30		0.24	0.24		0.24	0.12	0.49
v/c Ratio	1.13	1.23		1.73	1.43		0.84	0.56		0.30	0.77	0.53
Control Delay	95.0	126.0		407.4	237.7		70.8	42.8		41.3	72.6	19.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	95.0	126.0		407.4	237.7		70.8	42.8		41.3	72.6	19.5
LOS	F	F		F	F		E	D		D	E	B
Approach Delay		116.0			257.5			54.7			35.6	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	~617	~1463		~76	~856		117	157		34	134	181
Queue Length 95th (ft)	m287	m520		#196	#1102		#182	240		72	#215	276
Internal Link Dist (ft)		2141			2181			1083			1203	
Turn Bay Length (ft)	225			200			225			225		200
Base Capacity (vph)	639	1226		62	566		215	473		196	263	817
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.13	1.23		1.73	1.43		0.84	0.52		0.28	0.68	0.53

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 51 (43%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.73
 Intersection Signal Delay: 127.9
 Intersection Capacity Utilization 118.6%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H





















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Forestville Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

No-Build (2028) AM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	280	62	54	546	24	74	34	20	33	244	212
Future Volume (vph)	68	280	62	54	546	24	74	34	20	33	244	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.994			0.979				0.850
Flt Protected	0.950			0.950				0.972			0.994	
Satd. Flow (prot)	1761	1853	1575	1761	1842	0	0	1755	0	0	1870	1599
Flt Permitted	0.190			0.506				0.522			0.949	
Satd. Flow (perm)	352	1853	1575	938	1842	0	0	942	0	0	1785	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			69		2			7				215
Link Speed (mph)		45			45			45				45
Link Distance (ft)		1921			3001			1291			1308	
Travel Time (s)		29.1			45.5			19.6			19.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	311	69	60	607	27	82	38	22	37	271	236
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	311	69	60	634	0	0	142	0	0	308	236
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	17.0	74.0	74.0	14.0	71.0		47.0	47.0		47.0	47.0	17.0
Total Split (%)	12.6%	54.8%	54.8%	10.4%	52.6%		34.8%	34.8%		34.8%	34.8%	12.6%
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	45.7	41.3	41.3	47.2	37.8			25.5			25.5	38.7
Actuated g/C Ratio	0.52	0.47	0.47	0.54	0.43			0.29			0.29	0.44

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

No-Build (2028) AM
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.24	0.35	0.09	0.10	0.79			0.51			0.59	0.28
Control Delay	10.7	17.5	4.2	9.1	29.6			34.6			33.8	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	10.7	17.5	4.2	9.1	29.6			34.6			33.8	4.7
LOS	B	B	A	A	C			C			C	A
Approach Delay		14.4			27.9			34.6			21.2	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	16	105	0	12	270			58			136	6
Queue Length 95th (ft)	44	213	25	37	524			156			302	59
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	410	1503	1290	610	1445			487			917	907
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.19	0.21	0.05	0.10	0.44			0.29			0.34	0.26

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 87.2
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 23.0
 Intersection Capacity Utilization 74.5%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

No-Build (2028) PM
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	596	101	15	418	17	76	126	22	31	31	102
Future Volume (vph)	198	596	101	15	418	17	76	126	22	31	31	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.994			0.987				0.850
Flt Protected	0.950			0.950				0.983			0.976	
Satd. Flow (prot)	1761	1853	1575	1761	1842	0	0	1789	0	0	1836	1599
Flt Permitted	0.307			0.244				0.866			0.796	
Satd. Flow (perm)	569	1853	1575	452	1842	0	0	1576	0	0	1498	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			110		2			4				113
Link Speed (mph)		45			45			45				45
Link Distance (ft)		1921			3001			1291				1308
Travel Time (s)		29.1			45.5			19.6				19.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	662	112	17	464	19	84	140	24	34	34	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	662	112	17	483	0	0	248	0	0	68	113
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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Maximum Green (s)	14.2	73.6	73.6	8.9	68.6		36.6	36.6		36.0	36.0	14.2
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Vehicle Extension (s)	3.0	1.0	1.0	3.0	1.0		6.0	6.0		6.0	6.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

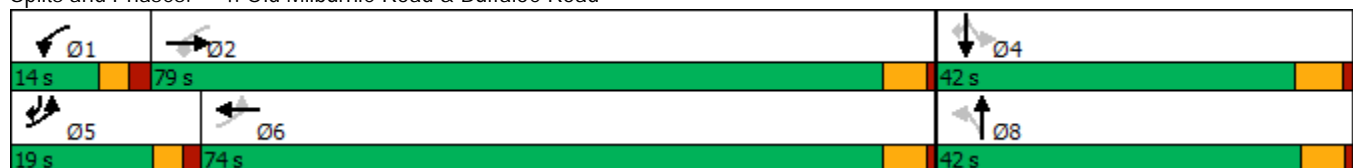
No-Build (2028) PM
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		15.0	15.0		15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		30.0	30.0		30.0	30.0	0.0
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	41.9	43.8	43.8	46.0	30.9			22.1			22.1	38.7
Actuated g/C Ratio	0.52	0.54	0.54	0.57	0.38			0.27			0.27	0.48
v/c Ratio	0.48	0.66	0.12	0.04	0.68			0.57			0.17	0.14
Control Delay	11.9	18.8	3.2	7.9	25.9			33.9			28.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	11.9	18.8	3.2	7.9	25.9			33.9			28.0	4.2
LOS	B	B	A	A	C			C			C	A
Approach Delay		15.5			25.3			33.9			13.2	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	42	171	0	3	179			92			23	0
Queue Length 95th (ft)	105	502	28	14	367			251			79	34
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	551	1618	1389	422	1561			800			759	907
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.40	0.41	0.08	0.04	0.31			0.31			0.09	0.12

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 80.6
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 20.2
 Intersection Capacity Utilization 68.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C





















Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) AM Brio Phase 1 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	266	62	54	498	16	74	34	20	30	244	212
Future Volume (vph)	68	266	62	54	498	16	74	34	20	30	244	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.995			0.979				0.850
Flt Protected	0.950			0.950				0.972			0.995	
Satd. Flow (prot)	1761	1853	1575	1761	1844	0	0	1755	0	0	1872	1599
Flt Permitted	0.223			0.517				0.550			0.955	
Satd. Flow (perm)	413	1853	1575	958	1844	0	0	993	0	0	1797	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			69		2			7				236
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1921			3001			1291			1308	
Travel Time (s)		29.1			45.5			19.6			19.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	296	69	60	553	18	82	38	22	33	271	236
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	296	69	60	571	0	0	142	0	0	304	236
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	17.0	74.0	74.0	14.0	71.0		47.0	47.0		47.0	47.0	17.0
Total Split (%)	12.6%	54.8%	54.8%	10.4%	52.6%		34.8%	34.8%		34.8%	34.8%	12.6%
Maximum Green (s)	12.2	68.6	68.6	8.9	65.6		41.6	41.6		41.0	41.0	12.2
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Vehicle Extension (s)	3.0	1.0	1.0	3.0	1.0		6.0	6.0		6.0	6.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		2.0	2.0		2.0	2.0	3.0

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) AM Brio Phase 1 - No River Towne

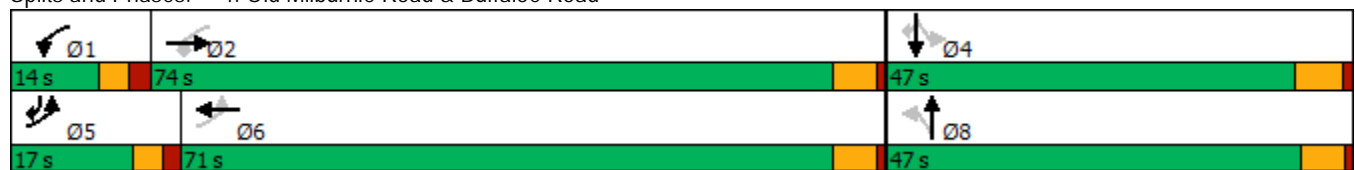
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		15.0	15.0		15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		30.0	30.0		30.0	30.0	0.0
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	39.9	35.5	35.5	41.3	32.1			23.7			23.7	36.8
Actuated g/C Ratio	0.50	0.45	0.45	0.52	0.40			0.30			0.30	0.46
v/c Ratio	0.22	0.36	0.09	0.10	0.77			0.47			0.57	0.27
Control Delay	10.2	17.7	4.4	9.0	28.2			30.4			30.3	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	10.2	17.7	4.4	9.0	28.2			30.4			30.3	3.3
LOS	B	B	A	A	C			C			C	A
Approach Delay		14.3			26.4			30.4			18.5	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	15	95	0	12	221			51			120	0
Queue Length 95th (ft)	42	195	24	35	433			140			269	44
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	448	1594	1365	608	1550			559			1007	951
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.17	0.19	0.05	0.10	0.37			0.25			0.30	0.25

Intersection Summary





















Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 79.5
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 21.2
 Intersection Capacity Utilization 71.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) PM Brio Phase 1 - No River Towne
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	536	101	15	385	12	76	126	22	22	31	102
Future Volume (vph)	198	536	101	15	385	12	76	126	22	22	31	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.996			0.987				0.850
Flt Protected	0.950			0.950				0.983			0.980	
Satd. Flow (prot)	1761	1853	1575	1761	1846	0	0	1789	0	0	1844	1599
Flt Permitted	0.334			0.282				0.870			0.853	
Satd. Flow (perm)	619	1853	1575	523	1846	0	0	1584	0	0	1605	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112		2			4				113
Link Speed (mph)		45			45			45				45
Link Distance (ft)		1921			3001			1291				1308
Travel Time (s)		29.1			45.5			19.6				19.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	596	112	17	428	13	84	140	24	24	34	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	596	112	17	441	0	0	248	0	0	58	113
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Maximum Green (s)	14.2	73.6	73.6	8.9	68.6		36.6	36.6		36.0	36.0	14.2
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Vehicle Extension (s)	3.0	1.0	1.0	3.0	1.0		6.0	6.0		6.0	6.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) PM Brio Phase 1 - No River Towne

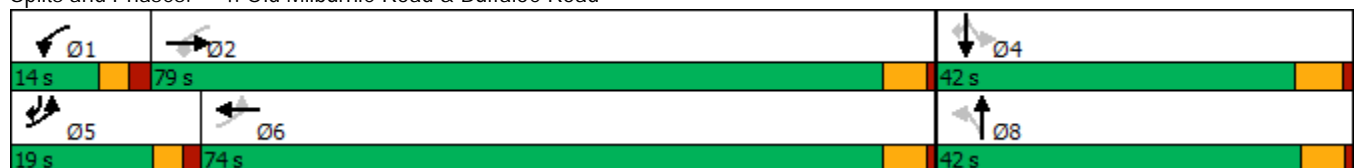
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		15.0	15.0		15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		30.0	30.0		30.0	30.0	0.0
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	37.4	39.2	39.2	41.3	26.5			20.9			20.9	37.3
Actuated g/C Ratio	0.50	0.52	0.52	0.55	0.35			0.28			0.28	0.50
v/c Ratio	0.46	0.61	0.13	0.04	0.67			0.55			0.13	0.13
Control Delay	11.5	17.8	3.3	7.7	25.9			30.8			24.9	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	11.5	17.8	3.3	7.7	25.9			30.8			24.9	3.6
LOS	B	B	A	A	C			C			C	A
Approach Delay		14.5			25.2			30.8			10.9	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	41	142	0	3	156			87			18	0
Queue Length 95th (ft)	100	415	28	13	318			227			63	31
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	574	1674	1433	455	1630			854			864	940
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.38	0.36	0.08	0.04	0.27			0.29			0.07	0.12

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 74.7
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 19.1
 Intersection Capacity Utilization 65.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C





















Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) AM Brio Phase 1

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	308	62	54	630	24	74	34	20	33	244	212
Future Volume (vph)	68	308	62	54	630	24	74	34	20	33	244	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.994			0.979				0.850
Flt Protected	0.950			0.950				0.972			0.994	
Satd. Flow (prot)	1761	1853	1575	1761	1842	0	0	1755	0	0	1870	1599
Flt Permitted	0.150			0.485				0.479			0.948	
Satd. Flow (perm)	278	1853	1575	899	1842	0	0	865	0	0	1784	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			69		2			7				184
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1921			3001			1291			1308	
Travel Time (s)		29.1			45.5			19.6			19.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	342	69	60	700	27	82	38	22	37	271	236
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	342	69	60	727	0	0	142	0	0	308	236
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Maximum Green (s)	14.2	73.6	73.6	8.9	68.6		36.6	36.6		36.0	36.0	14.2
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Vehicle Extension (s)	3.0	1.0	1.0	3.0	1.0		6.0	6.0		6.0	6.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0

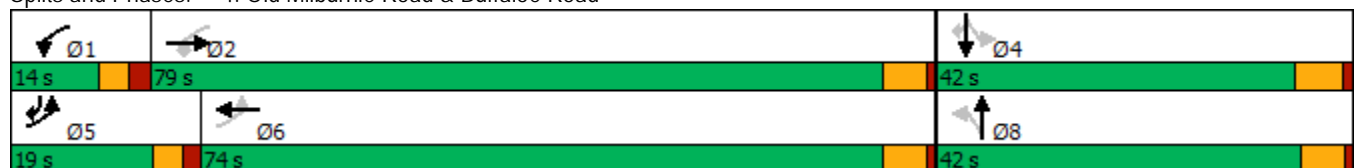
Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		15.0	15.0		15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		30.0	30.0		30.0	30.0	0.0
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	53.9	49.6	49.6	55.4	46.0			26.9			26.9	40.1
Actuated g/C Ratio	0.56	0.51	0.51	0.57	0.48			0.28			0.28	0.41
v/c Ratio	0.28	0.36	0.08	0.10	0.83			0.58			0.62	0.31
Control Delay	11.0	16.9	3.8	8.8	31.3			42.7			39.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	11.0	16.9	3.8	8.8	31.3			42.7			39.1	7.4
LOS	B	B	A	A	C			D			D	A
Approach Delay		14.1			29.6			42.7			25.3	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)	17	123	0	13	352			69			159	19
Queue Length 95th (ft)	42	227	23	35	622			174			326	85
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	398	1456	1253	610	1375			356			726	873
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.19	0.23	0.06	0.10	0.53			0.40			0.42	0.27

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 96.7
 Natural Cycle: 80
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 25.5
 Intersection Capacity Utilization 78.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D





















Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) PM Brio Phase 1

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	684	101	15	473	17	76	126	22	31	31	102
Future Volume (vph)	198	684	101	15	473	17	76	126	22	31	31	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.995			0.987				0.850
Flt Protected	0.950			0.950				0.983			0.976	
Satd. Flow (prot)	1761	1853	1575	1761	1844	0	0	1789	0	0	1836	1599
Flt Permitted	0.270			0.188				0.866			0.788	
Satd. Flow (perm)	500	1853	1575	348	1844	0	0	1576	0	0	1483	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			96		2			4				113
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1921			3001			1291			1308	
Travel Time (s)		29.1			45.5			19.6			19.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	760	112	17	526	19	84	140	24	34	34	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	760	112	17	545	0	0	248	0	0	68	113
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Maximum Green (s)	14.2	73.6	73.6	8.9	68.6		36.6	36.6		36.0	36.0	14.2
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Vehicle Extension (s)	3.0	1.0	1.0	3.0	1.0		6.0	6.0		6.0	6.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

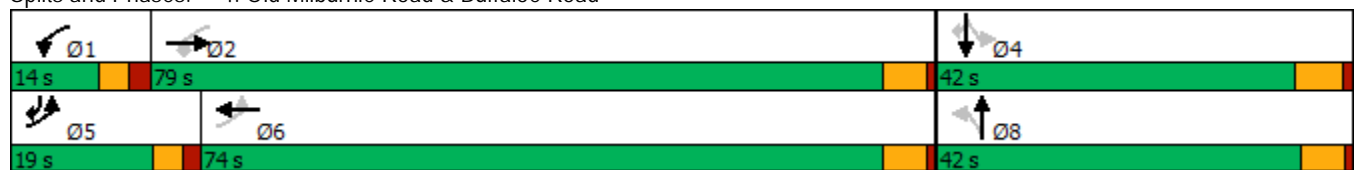
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		15.0	15.0		15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		30.0	30.0		30.0	30.0	0.0
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	47.8	49.9	49.9	51.9	36.7			23.7			23.7	40.5
Actuated g/C Ratio	0.54	0.57	0.57	0.59	0.42			0.27			0.27	0.46
v/c Ratio	0.51	0.73	0.12	0.05	0.71			0.58			0.17	0.14
Control Delay	12.7	21.0	4.0	8.0	26.6			37.6			31.4	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	12.7	21.0	4.0	8.0	26.6			37.6			31.4	4.8
LOS	B	C	A	A	C			D			C	A
Approach Delay		17.6			26.0			37.6			14.8	
Approach LOS		B			C			D			B	
Queue Length 50th (ft)	45	229	3	3	221			101			25	0
Queue Length 95th (ft)	108	640	34	14	438			273			86	37
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	516	1544	1329	367	1483			740			695	870
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.43	0.49	0.08	0.05	0.37			0.34			0.10	0.13

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 88.3
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 22.0
 Intersection Capacity Utilization 73.2%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D





















Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) AM Brio Ph 1+2 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	286	62	54	537	16	74	34	20	30	244	212
Future Volume (vph)	68	286	62	54	537	16	74	34	20	30	244	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.996			0.979				0.850
Flt Protected	0.950			0.950				0.972			0.995	
Satd. Flow (prot)	1761	1853	1575	1761	1846	0	0	1755	0	0	1872	1599
Flt Permitted	0.201			0.498				0.533			0.955	
Satd. Flow (perm)	373	1853	1575	923	1846	0	0	962	0	0	1797	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			69		2			7				221
Link Speed (mph)		45			45			45				45
Link Distance (ft)		1921			3001			1291				1308
Travel Time (s)		29.1			45.5			19.6				19.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	318	69	60	597	18	82	38	22	33	271	236
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	318	69	60	615	0	0	142	0	0	304	236
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	17.0	74.0	74.0	14.0	71.0		47.0	47.0		47.0	47.0	17.0
Total Split (%)	12.6%	54.8%	54.8%	10.4%	52.6%		34.8%	34.8%		34.8%	34.8%	12.6%
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effect Green (s)	43.5	39.1	39.1	45.0	35.7			24.6			24.6	37.8
Actuated g/C Ratio	0.52	0.46	0.46	0.54	0.42			0.29			0.29	0.45

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) AM Brio Ph 1+2 - No River Towne
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.24	0.37	0.09	0.11	0.78			0.50			0.58	0.28
Control Delay	10.5	17.7	4.2	9.0	29.0			33.0			32.3	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	10.5	17.7	4.2	9.0	29.0			33.0			32.3	4.2
LOS	B	B	A	A	C			C			C	A
Approach Delay		14.5			27.2			33.0			20.0	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	15	106	0	12	252			55			127	4
Queue Length 95th (ft)	44	215	24	36	491			150			288	54
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	425	1546	1325	601	1490			513			953	920
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.18	0.21	0.05	0.10	0.41			0.28			0.32	0.26

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 84.1
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 22.3
 Intersection Capacity Utilization 73.3%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D





















Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) PM Brio Phase 1+2 - No River Towne

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	578	101	15	411	12	76	126	22	22	31	102
Future Volume (vph)	198	578	101	15	411	12	76	126	22	22	31	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.996			0.987				0.850
Flt Protected	0.950			0.950				0.983			0.980	
Satd. Flow (prot)	1761	1853	1575	1761	1846	0	0	1789	0	0	1844	1599
Flt Permitted	0.315			0.255				0.870			0.852	
Satd. Flow (perm)	584	1853	1575	473	1846	0	0	1584	0	0	1603	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112		2			4				113
Link Speed (mph)		45			45			45				45
Link Distance (ft)		1921			3001			1291				1308
Travel Time (s)		29.1			45.5			19.6				19.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	642	112	17	457	13	84	140	24	24	34	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	642	112	17	470	0	0	248	0	0	58	113
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effect Green (s)	40.3	42.2	42.2	44.3	29.3			21.8			21.8	38.3
Actuated g/C Ratio	0.51	0.54	0.54	0.56	0.37			0.28			0.28	0.49

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) PM Brio Phase 1+2 - No River Towne

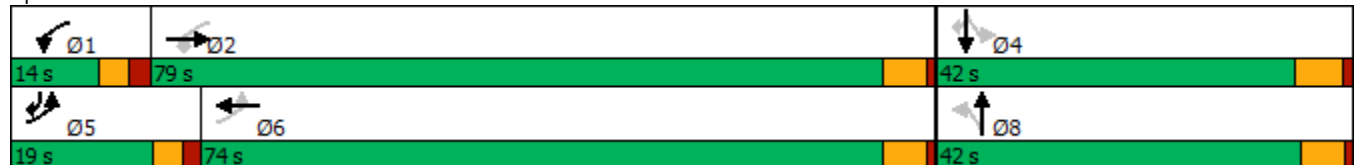
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.47	0.65	0.12	0.04	0.68			0.56			0.13	0.14
Control Delay	11.8	18.5	3.1	7.9	25.9			32.9			26.9	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	11.8	18.5	3.1	7.9	25.9			32.9			26.9	4.1
LOS	B	B	A	A	C			C			C	A
Approach Delay		15.2			25.3			32.9			11.8	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	42	162	0	3	172			90			19	0
Queue Length 95th (ft)	103	475	28	13	351			245			67	33
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	559	1634	1402	432	1585			824			831	920
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.39	0.39	0.08	0.04	0.30			0.30			0.07	0.12

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 78.6
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 19.8
 Intersection Capacity Utilization 67.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C





















Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) AM Brio Phase 1+2

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	328	62	54	669	24	74	34	20	33	244	212
Future Volume (vph)	68	328	62	54	669	24	74	34	20	33	244	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.995			0.979				0.850
Flt Protected	0.950			0.950				0.972			0.994	
Satd. Flow (prot)	1761	1853	1575	1761	1844	0	0	1755	0	0	1870	1599
Flt Permitted	0.131			0.469				0.463			0.947	
Satd. Flow (perm)	243	1853	1575	869	1844	0	0	836	0	0	1782	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			69		2			7				164
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1921			3001			1291			1308	
Travel Time (s)		29.1			45.5			19.6			19.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	364	69	60	743	27	82	38	22	37	271	236
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	364	69	60	770	0	0	142	0	0	308	236
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	57.5	53.2	53.2	59.0	49.7			27.7			27.7	40.8
Actuated g/C Ratio	0.57	0.53	0.53	0.58	0.49			0.27			0.27	0.40

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.30	0.37	0.08	0.10	0.85			0.61			0.63	0.32
Control Delay	11.5	16.9	3.7	8.8	32.9			46.0			41.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	11.5	16.9	3.7	8.8	32.9			46.0			41.0	9.4
LOS	B	B	A	A	C			D			D	A
Approach Delay		14.3			31.1			46.0			27.3	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)	17	137	0	14	398			75			172	29
Queue Length 95th (ft)	42	243	23	35	685			176			326	99
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	373	1403	1209	600	1327			328			691	842
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.20	0.26	0.06	0.10	0.58			0.43			0.45	0.28

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 101.1
 Natural Cycle: 80
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 26.9
 Intersection Capacity Utilization 80.9%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D





















Splits and Phases: 4: Old Milburnie Road & Buffalo Road















Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) PM Brio Phase 1+2

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	726	101	15	499	17	76	126	22	31	31	102
Future Volume (vph)	198	726	101	15	499	17	76	126	22	31	31	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.995			0.987				0.850
Flt Protected	0.950			0.950				0.983			0.976	
Satd. Flow (prot)	1761	1853	1575	1761	1844	0	0	1789	0	0	1836	1599
Flt Permitted	0.251			0.160				0.866			0.785	
Satd. Flow (perm)	465	1853	1575	297	1844	0	0	1576	0	0	1477	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			90		2			4				113
Link Speed (mph)		45			45			45				45
Link Distance (ft)		1921			3001			1291				1308
Travel Time (s)		29.1			45.5			19.6				19.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	807	112	17	554	19	84	140	24	34	34	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	807	112	17	573	0	0	248	0	0	68	113
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			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effect Green (s)	50.0	52.1	52.1	54.2	38.9			24.6			24.6	41.3
Actuated g/C Ratio	0.55	0.57	0.57	0.59	0.43			0.27			0.27	0.45

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.53	0.76	0.12	0.06	0.73			0.58			0.17	0.14
Control Delay	13.4	22.7	4.3	8.1	27.3			38.6			32.5	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	13.4	22.7	4.3	8.1	27.3			38.6			32.5	4.9
LOS	B	C	A	A	C			D			C	A
Approach Delay		19.1			26.8			38.6			15.3	
Approach LOS		B			C			D			B	
Queue Length 50th (ft)	47	265	4	3	244			105			26	0
Queue Length 95th (ft)	108	712	37	14	469			273			86	37
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	497	1514	1303	339	1455			716			669	858
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.44	0.53	0.09	0.05	0.39			0.35			0.10	0.13

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 91.4
 Natural Cycle: 80
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 23.1
 Intersection Capacity Utilization 75.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D





















Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	364	62	54	711	24	74	34	20	33	244	212
Future Volume (vph)	68	364	62	54	711	24	74	34	20	33	244	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		200
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.995			0.979				0.850
Flt Protected	0.950			0.950				0.972			0.994	
Satd. Flow (prot)	1761	1853	1575	1761	1844	0	0	1755	0	0	1870	1599
Flt Permitted	0.114			0.440				0.442			0.947	
Satd. Flow (perm)	211	1853	1575	816	1844	0	0	798	0	0	1782	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			69		2			7				145
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1921			3001			1291			1308	
Travel Time (s)		29.1			45.5			19.6			19.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	404	69	60	790	27	82	38	22	37	271	236
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	404	69	60	817	0	0	142	0	0	308	236
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	62.0	57.7	57.7	63.4	54.2			28.4			28.4	41.4
Actuated g/C Ratio	0.58	0.54	0.54	0.60	0.51			0.27			0.27	0.39

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.32	0.40	0.08	0.11	0.87			0.65			0.65	0.33
Control Delay	12.1	17.2	3.6	8.7	34.3			51.0			43.4	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	12.1	17.2	3.6	8.7	34.3			51.0			43.4	11.5
LOS	B	B	A	A	C			D			D	B
Approach Delay		14.8			32.6			51.0			29.6	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)	18	163	0	14	461			84			190	41
Queue Length 95th (ft)	42	275	23	35	762			179			326	112
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								200
Base Capacity (vph)	347	1350	1166	579	1257			295			651	806
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.22	0.30	0.06	0.10	0.65			0.48			0.47	0.29

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 106.1
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 28.4
 Intersection Capacity Utilization 83.1%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)

Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	806	101	15	571	17	76	126	22	31	31	102
Future Volume (vph)	198	806	101	15	571	17	76	126	22	31	31	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			2%			-2%	
Storage Length (ft)	150		0	50		0	0		0	0		300
Storage Lanes	1		1	1		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.996			0.987				0.850
Flt Protected	0.950			0.950				0.983			0.976	
Satd. Flow (prot)	1761	1853	1575	1761	1846	0	0	1789	0	0	1836	1599
Flt Permitted	0.203			0.113				0.865			0.776	
Satd. Flow (perm)	376	1853	1575	209	1846	0	0	1574	0	0	1460	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			81		2			4				113
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1921			3001			1291			1308	
Travel Time (s)		29.1			45.5			19.6			19.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	896	112	17	634	19	84	140	24	34	34	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	896	112	17	653	0	0	248	0	0	68	113
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	D.P+P	NA	Perm	D.P+P	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	6		2	2			8			4		4
Detector Phase	5	2	2	1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.4	17.4	14.0	17.4		14.0	14.0		14.0	14.0	14.0
Total Split (s)	19.0	79.0	79.0	14.0	74.0		42.0	42.0		42.0	42.0	19.0
Total Split (%)	14.1%	58.5%	58.5%	10.4%	54.8%		31.1%	31.1%		31.1%	31.1%	14.1%
Maximum Green (s)	14.2	73.6	73.6	8.9	68.6		36.6	36.6		36.0	36.0	14.2
Yellow Time (s)	3.0	4.4	4.4	3.0	4.4		4.3	4.3		4.7	4.7	3.0
All-Red Time (s)	1.8	1.0	1.0	2.1	1.0		1.1	1.1		1.3	1.3	1.8
Lost Time Adjust (s)	0.2	-0.4	-0.4	-0.1	-0.4			-0.4			-1.0	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							Yes
Vehicle Extension (s)	3.0	1.0	1.0	3.0	1.0		6.0	6.0		6.0	6.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0

Lanes, Volumes, Timings
4: Old Milburnie Road & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)

Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		15.0	15.0		15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		30.0	30.0		30.0	30.0	0.0
Recall Mode	None	Min	Min	None	Min		None	None		None	None	None
Act Effct Green (s)	54.9	56.8	56.8	58.9	44.0			25.6			25.6	42.1
Actuated g/C Ratio	0.57	0.59	0.59	0.61	0.45			0.26			0.26	0.43
v/c Ratio	0.60	0.83	0.12	0.07	0.78			0.59			0.18	0.15
Control Delay	15.5	26.0	4.8	8.2	29.5			41.0			34.3	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	0.0
Total Delay	15.5	26.0	4.8	8.2	29.5			41.0			34.3	5.0
LOS	B	C	A	A	C			D			C	A
Approach Delay		22.2			28.9			41.0			16.0	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	50	347	6	3	311			119			29	0
Queue Length 95th (ft)	108	#883	40	14	568			273			86	37
Internal Link Dist (ft)		1841			2921			1211			1228	
Turn Bay Length (ft)	150			50								300
Base Capacity (vph)	447	1461	1259	286	1382			662			611	824
Starvation Cap Reductn	0	0	0	0	0			0			0	0
Spillback Cap Reductn	0	0	0	0	0			0			0	0
Storage Cap Reductn	0	0	0	0	0			0			0	0
Reduced v/c Ratio	0.49	0.61	0.09	0.06	0.47			0.37			0.11	0.14

Intersection Summary























Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 97
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 25.7
 Intersection Capacity Utilization 79.6%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Old Milburnie Road & Buffalo Road



Lanes, Volumes, Timings
9: N Smithfield Road/Horton Road & Forestville Road

No-Build (2028) AM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	132	192	56	172	10	147	125	47	27	174	21
Future Volume (vph)	28	132	192	56	172	10	147	125	47	27	174	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.911				0.850		0.959			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1663	0	1761	1853	1575	1770	1786	0	1725	1787	0
Flt Permitted	0.393			0.365			0.610			0.630		
Satd. Flow (perm)	717	1663	0	677	1853	1575	1136	1786	0	1144	1787	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	147	213	62	191	11	163	139	52	30	193	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	360	0	62	191	11	163	191	0	30	216	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effect Green (s)	41.3	41.3		33.2	33.2	33.2	93.7	93.7		93.7	93.7	
Actuated g/C Ratio	0.28	0.28		0.23	0.23	0.23	0.65	0.65		0.65	0.65	

Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

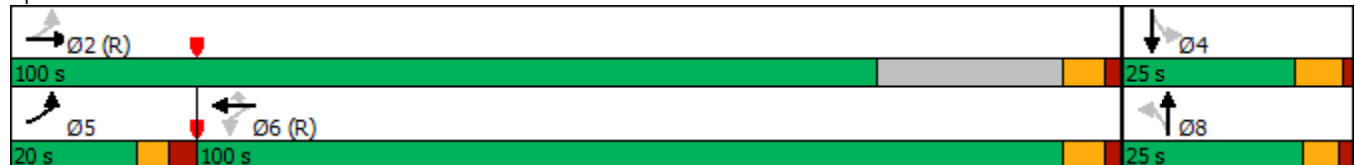
No-Build (2028) AM
 Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.12	0.76		0.40	0.45	0.03	0.22	0.17		0.04	0.19	
Control Delay	35.9	57.6		56.5	52.0	43.6	12.7	11.6		11.4	11.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.9	57.6		56.5	52.0	43.6	12.7	11.6		11.4	11.8	
LOS	D	E		E	D	D	B	B		B	B	
Approach Delay		55.9			52.7			12.1			11.8	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	21	312		53	165	9	60	67		10	77	
Queue Length 95th (ft)	44	393		97	227	25	117	124		28	139	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	309	1318		443	1214	1031	733	1153		738	1154	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.10	0.27		0.14	0.16	0.01	0.22	0.17		0.04	0.19	

Intersection Summary























Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 34.2
 Intersection Capacity Utilization 64.0%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road



Lanes, Volumes, Timings
9: N Smithfield Road/Horton Road & Forestville Road

No-Build (2028) PM
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	180	155	60	96	13	207	171	86	19	130	24
Future Volume (vph)	26	180	155	60	96	13	207	171	86	19	130	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.931				0.850		0.950			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1700	0	1761	1853	1575	1770	1770	0	1725	1773	0
Flt Permitted	0.543			0.329			0.647			0.557		
Satd. Flow (perm)	991	1700	0	610	1853	1575	1205	1770	0	1012	1773	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	200	172	67	107	14	230	190	96	21	144	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	372	0	67	107	14	230	286	0	21	171	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Maximum Green (s)	13.5	93.5		93.5	93.5	93.5	19.4	19.4		18.6	18.6	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	1.0	6.0		6.0	6.0	6.0	1.0	1.0		1.0	1.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

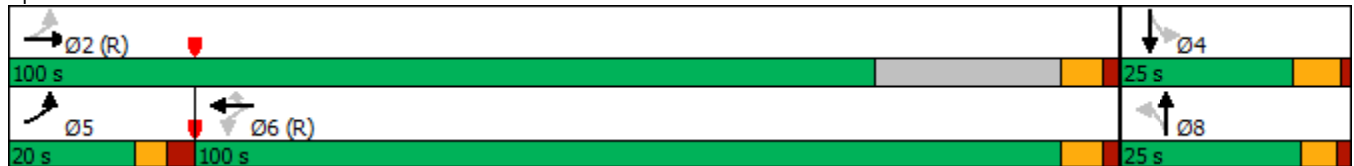
No-Build (2028) PM
 Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0		15.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	35.0		35.0	35.0	35.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effct Green (s)	40.3	40.3		32.2	32.2	32.2	94.7	94.7		94.7	94.7	
Actuated g/C Ratio	0.28	0.28		0.22	0.22	0.22	0.65	0.65		0.65	0.65	
v/c Ratio	0.09	0.79		0.50	0.26	0.04	0.29	0.25		0.03	0.15	
Control Delay	35.8	60.3		63.1	48.2	43.8	13.3	12.2		11.4	11.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.8	60.3		63.1	48.2	43.8	13.3	12.2		11.4	11.3	
LOS	D	E		E	D	D	B	B		B	B	
Approach Delay		58.5			53.2			12.7			11.3	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	21	335		60	90	11	82	99		6	55	
Queue Length 95th (ft)	41	397		104	132	29	172	193		22	115	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	351	1348		399	1214	1031	787	1156		661	1158	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.08	0.28		0.17	0.09	0.01	0.29	0.25		0.03	0.15	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 32.5
 Intersection Capacity Utilization 65.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road
























Lanes, Volumes, Timings

Build (2028) AM Brio Phase 1 - No River Towne

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	132	229	56	172	10	159	125	47	27	174	21
Future Volume (vph)	28	132	229	56	172	10	159	125	47	27	174	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.905				0.850		0.959			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1652	0	1761	1853	1575	1770	1786	0	1725	1787	0
Flt Permitted	0.417			0.317			0.607			0.628		
Satd. Flow (perm)	761	1652	0	588	1853	1575	1131	1786	0	1141	1787	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	147	254	62	191	11	177	139	52	30	193	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	401	0	62	191	11	177	191	0	30	216	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Maximum Green (s)	13.5	93.5		93.5	93.5	93.5	19.4	19.4		18.6	18.6	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	1.0	6.0		6.0	6.0	6.0	1.0	1.0		1.0	1.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lanes, Volumes, Timings

Build (2028) AM Brio Phase 1 - No River Towne

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0		15.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	35.0		35.0	35.0	35.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effct Green (s)	44.0	44.0		35.9	35.9	35.9	91.0	91.0		91.0	91.0	
Actuated g/C Ratio	0.30	0.30		0.25	0.25	0.25	0.63	0.63		0.63	0.63	
v/c Ratio	0.11	0.80		0.43	0.42	0.03	0.25	0.17		0.04	0.19	
Control Delay	32.6	58.0		55.1	48.2	39.5	14.9	13.4		13.5	13.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	32.6	58.0		55.1	48.2	39.5	14.9	13.4		13.5	13.6	
LOS	C	E		E	D	D	B	B		B	B	
Approach Delay		56.2			49.5			14.1			13.6	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	21	355		53	163	8	68	69		10	79	
Queue Length 95th (ft)	40	412		93	210	23	144	140		31	157	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	331	1310		385	1214	1031	709	1120		715	1121	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.09	0.31		0.16	0.16	0.01	0.25	0.17		0.04	0.19	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 35.0
 Intersection Capacity Utilization 66.9%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road
























Lanes, Volumes, Timings

Build (2028) PM Brio Phase 1 - No River Towne

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	180	181	60	96	13	246	171	86	19	130	24
Future Volume (vph)	26	180	181	60	96	13	246	171	86	19	130	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.925				0.850		0.950			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1689	0	1761	1853	1575	1770	1770	0	1725	1773	0
Flt Permitted	0.558			0.308			0.645			0.552		
Satd. Flow (perm)	1019	1689	0	571	1853	1575	1201	1770	0	1003	1773	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	200	201	67	107	14	273	190	96	21	144	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	401	0	67	107	14	273	286	0	21	171	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Maximum Green (s)	13.5	93.5		93.5	93.5	93.5	19.4	19.4		18.6	18.6	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	1.0	6.0		6.0	6.0	6.0	1.0	1.0		1.0	1.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lanes, Volumes, Timings

Build (2028) PM Brio Phase 1 - No River Towne

9: N Smithfield Road/Horton Road & Forestville Road

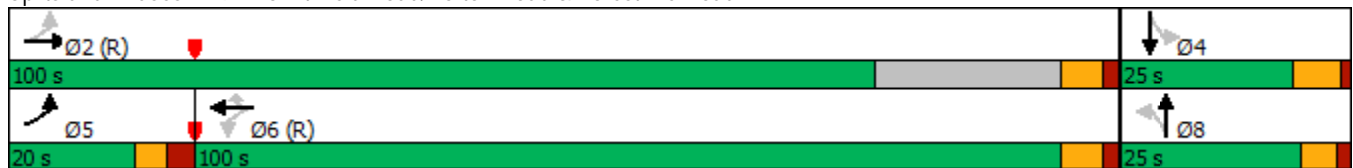
Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0		15.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	35.0		35.0	35.0	35.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effct Green (s)	43.2	43.2		35.1	35.1	35.1	91.8	91.8		91.8	91.8	
Actuated g/C Ratio	0.30	0.30		0.24	0.24	0.24	0.63	0.63		0.63	0.63	
v/c Ratio	0.08	0.80		0.49	0.24	0.04	0.36	0.26		0.03	0.15	
Control Delay	32.8	58.2		59.4	44.9	40.4	16.2	13.9		13.3	12.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	32.8	58.2		59.4	44.9	40.4	16.2	13.9		13.3	12.9	
LOS	C	E		E	D	D	B	B		B	B	
Approach Delay		56.5			49.7			15.0			13.0	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	20	357		59	88	11	112	108		7	60	
Queue Length 95th (ft)	39	410		101	125	28	228	211		24	125	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	377	1339		374	1214	1031	760	1120		634	1122	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.08	0.30		0.18	0.09	0.01	0.36	0.26		0.03	0.15	

Intersection Summary






















Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 32.5
 Intersection Capacity Utilization 69.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road



Lanes, Volumes, Timings
9: N Smithfield Road/Horton Road & Forestville Road

Build (2028) AM Brio Phase 1
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	132	237	56	172	10	162	125	47	27	174	21
Future Volume (vph)	28	132	237	56	172	10	162	125	47	27	174	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.904				0.850		0.959			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1650	0	1761	1853	1575	1770	1786	0	1725	1787	0
Flt Permitted	0.424			0.311			0.606			0.627		
Satd. Flow (perm)	774	1650	0	576	1853	1575	1129	1786	0	1139	1787	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	147	263	62	191	11	180	139	52	30	193	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	410	0	62	191	11	180	191	0	30	216	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Maximum Green (s)	13.5	93.5		93.5	93.5	93.5	19.4	19.4		18.6	18.6	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	1.0	6.0		6.0	6.0	6.0	1.0	1.0		1.0	1.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

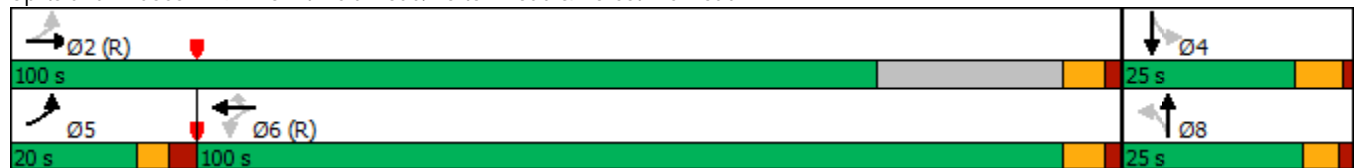
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0		15.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	35.0		35.0	35.0	35.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effect Green (s)	44.9	44.9		36.8	36.8	36.8	90.1	90.1		90.1	90.1	
Actuated g/C Ratio	0.31	0.31		0.25	0.25	0.25	0.62	0.62		0.62	0.62	
v/c Ratio	0.10	0.80		0.42	0.41	0.03	0.26	0.17		0.04	0.19	
Control Delay	31.7	57.4		54.0	47.2	38.5	15.6	13.9		14.1	14.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	31.7	57.4		54.0	47.2	38.5	15.6	13.9		14.1	14.1	
LOS	C	E		D	D	D	B	B		B	B	
Approach Delay		55.6			48.4			14.7			14.1	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	21	362		53	161	8	71	71		10	81	
Queue Length 95th (ft)	40	415		91	207	22	151	144		32	161	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	339	1308		377	1214	1031	701	1109		707	1109	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.09	0.31		0.16	0.16	0.01	0.26	0.17		0.04	0.19	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 35.0
 Intersection Capacity Utilization 67.6%
 Analysis Period (min) 15






















Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road



Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

Build (2028) PM Brio Phase 1
 Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	180	186	60	96	13	255	171	86	19	130	24
Future Volume (vph)	26	180	186	60	96	13	255	171	86	19	130	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.924				0.850		0.950			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1687	0	1761	1853	1575	1770	1770	0	1725	1773	0
Flt Permitted	0.561			0.305			0.644			0.551		
Satd. Flow (perm)	1024	1687	0	565	1853	1575	1200	1770	0	1001	1773	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	200	207	67	107	14	283	190	96	21	144	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	407	0	67	107	14	283	286	0	21	171	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Maximum Green (s)	13.5	93.5		93.5	93.5	93.5	19.4	19.4		18.6	18.6	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	1.0	6.0		6.0	6.0	6.0	1.0	1.0		1.0	1.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

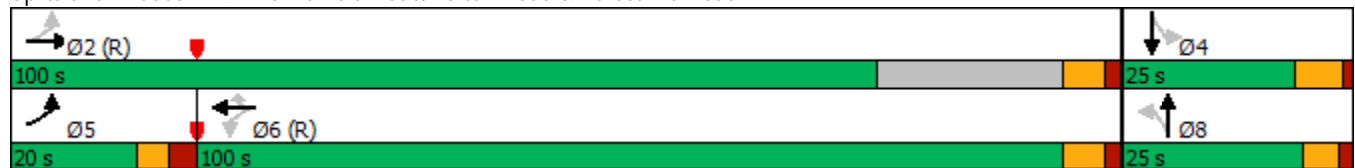
Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0		15.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	35.0		35.0	35.0	35.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effct Green (s)	43.9	43.9		35.8	35.8	35.8	91.1	91.1		91.1	91.1	
Actuated g/C Ratio	0.30	0.30		0.25	0.25	0.25	0.63	0.63		0.63	0.63	
v/c Ratio	0.08	0.80		0.48	0.23	0.04	0.38	0.26		0.03	0.15	
Control Delay	32.2	57.6		58.4	44.2	39.7	16.9	14.3		13.7	13.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	32.2	57.6		58.4	44.2	39.7	16.9	14.3		13.7	13.3	
LOS	C	E		E	D	D	B	B		B	B	
Approach Delay		55.9			48.9			15.6			13.3	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	20	361		58	87	11	119	110		7	61	
Queue Length 95th (ft)	38	411		100	124	27	243	214		25	128	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	383	1337		370	1214	1031	753	1111		628	1113	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.08	0.30		0.18	0.09	0.01	0.38	0.26		0.03	0.15	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 32.5
 Intersection Capacity Utilization 69.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road

























Lanes, Volumes, Timings

Build (2028) AM Brio Ph 1+2 - No River Towne

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	132	229	56	172	10	159	136	47	27	195	21
Future Volume (vph)	28	132	229	56	172	10	159	136	47	27	195	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.905				0.850		0.962			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1652	0	1761	1853	1575	1770	1792	0	1725	1791	0
Flt Permitted	0.417			0.317			0.587			0.618		
Satd. Flow (perm)	761	1652	0	588	1853	1575	1093	1792	0	1122	1791	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	147	254	62	191	11	177	151	52	30	217	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	401	0	62	191	11	177	203	0	30	240	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effect Green (s)	44.0	44.0		35.9	35.9	35.9	91.0	91.0		91.0	91.0	
Actuated g/C Ratio	0.30	0.30		0.25	0.25	0.25	0.63	0.63		0.63	0.63	

Lanes, Volumes, Timings

Build (2028) AM Brio Ph 1+2 - No River Towne

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.11	0.80		0.43	0.42	0.03	0.26	0.18		0.04	0.21	
Control Delay	32.6	58.0		55.1	48.2	39.5	15.1	13.5		13.5	13.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	32.6	58.0		55.1	48.2	39.5	15.1	13.5		13.5	13.8	
LOS	C	E		E	D	D	B	B		B	B	
Approach Delay		56.2			49.5			14.2			13.8	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	21	355		53	163	8	68	74		10	90	
Queue Length 95th (ft)	40	412		93	210	23	145	148		31	175	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	331	1310		385	1214	1031	686	1124		703	1123	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.09	0.31		0.16	0.16	0.01	0.26	0.18		0.04	0.21	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 34.5
 Intersection Capacity Utilization 68.0%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road


























Lanes, Volumes, Timings

Build (2028) PM Brio Phase 1+2 - No River Towne

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	180	181	60	96	13	246	193	86	19	144	24
Future Volume (vph)	26	180	181	60	96	13	246	193	86	19	144	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.925				0.850		0.954			0.978	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1689	0	1761	1853	1575	1770	1777	0	1725	1776	0
Flt Permitted	0.558			0.308			0.632			0.534		
Satd. Flow (perm)	1019	1689	0	571	1853	1575	1177	1777	0	970	1776	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	200	201	67	107	14	273	214	96	21	160	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	401	0	67	107	14	273	310	0	21	187	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effect Green (s)	43.2	43.2		35.1	35.1	35.1	91.8	91.8		91.8	91.8	
Actuated g/C Ratio	0.30	0.30		0.24	0.24	0.24	0.63	0.63		0.63	0.63	

Lanes, Volumes, Timings

Build (2028) PM Brio Phase 1+2 - No River Towne

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.08	0.80		0.49	0.24	0.04	0.37	0.28		0.03	0.17	
Control Delay	32.8	58.2		59.4	44.9	40.4	16.4	14.2		13.3	13.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	32.8	58.2		59.4	44.9	40.4	16.4	14.2		13.3	13.0	
LOS	C	E		E	D	D	B	B		B	B	
Approach Delay		56.5			49.7			15.2			13.0	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	20	357		59	88	11	112	119		7	66	
Queue Length 95th (ft)	39	410		101	125	28	230	229		24	136	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	377	1339		374	1214	1031	744	1124		614	1124	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.08	0.30		0.18	0.09	0.01	0.37	0.28		0.03	0.17	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 32.1
 Intersection Capacity Utilization 69.9%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C
























Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road



Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

Build (2028) AM Brio Phase 1+2

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	132	237	56	172	10	162	136	47	27	195	21
Future Volume (vph)	28	132	237	56	172	10	162	136	47	27	195	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.904				0.850		0.962			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1650	0	1761	1853	1575	1770	1792	0	1725	1791	0
Flt Permitted	0.424			0.311			0.586			0.617		
Satd. Flow (perm)	774	1650	0	576	1853	1575	1092	1792	0	1121	1791	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	147	263	62	191	11	180	151	52	30	217	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	410	0	62	191	11	180	203	0	30	240	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effect Green (s)	44.9	44.9		36.8	36.8	36.8	90.1	90.1		90.1	90.1	
Actuated g/C Ratio	0.31	0.31		0.25	0.25	0.25	0.62	0.62		0.62	0.62	

Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

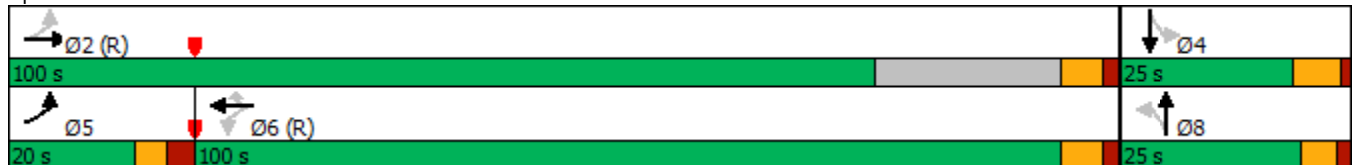
Build (2028) AM Brio Phase 1+2
 Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.10	0.80		0.42	0.41	0.03	0.27	0.18		0.04	0.22	
Control Delay	31.7	57.4		54.0	47.2	38.5	15.8	14.0		14.1	14.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	31.7	57.4		54.0	47.2	38.5	15.8	14.0		14.1	14.4	
LOS	C	E		D	D	D	B	B		B	B	
Approach Delay		55.6			48.4			14.9			14.3	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	21	362		53	161	8	71	76		10	92	
Queue Length 95th (ft)	40	415		91	207	22	152	152		32	180	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	339	1308		377	1214	1031	678	1113		696	1112	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.09	0.31		0.16	0.16	0.01	0.27	0.18		0.04	0.22	

Intersection Summary






















Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 34.5
 Intersection Capacity Utilization 68.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road



Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

Build (2028) PM Brio Phase 1+2
 Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	180	186	60	96	13	255	193	86	19	144	24
Future Volume (vph)	26	180	186	60	96	13	255	193	86	19	144	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.924				0.850		0.954			0.978	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1687	0	1761	1853	1575	1770	1777	0	1725	1776	0
Flt Permitted	0.561			0.305			0.631			0.533		
Satd. Flow (perm)	1024	1687	0	565	1853	1575	1175	1777	0	968	1776	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	200	207	67	107	14	283	214	96	21	160	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	407	0	67	107	14	283	310	0	21	187	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effect Green (s)	43.9	43.9		35.8	35.8	35.8	91.1	91.1		91.1	91.1	
Actuated g/C Ratio	0.30	0.30		0.25	0.25	0.25	0.63	0.63		0.63	0.63	

Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

Build (2028) PM Brio Phase 1+2

Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.08	0.80		0.48	0.23	0.04	0.38	0.28		0.03	0.17	
Control Delay	32.2	57.6		58.4	44.2	39.7	17.1	14.6		13.7	13.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	32.2	57.6		58.4	44.2	39.7	17.1	14.6		13.7	13.4	
LOS	C	E		E	D	D	B	B		B	B	
Approach Delay		55.9			48.9			15.8			13.4	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	20	361		58	87	11	120	121		7	67	
Queue Length 95th (ft)	38	411		100	124	27	245	233		25	139	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	383	1337		370	1214	1031	738	1116		607	1115	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.08	0.30		0.18	0.09	0.01	0.38	0.28		0.03	0.17	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 32.1
 Intersection Capacity Utilization 70.7%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road


























Lanes, Volumes, Timings

Build (2028) AM Phase 1+2+3 (Full Build)

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	132	237	56	172	10	162	155	47	27	217	21
Future Volume (vph)	28	132	237	56	172	10	162	155	47	27	217	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.904				0.850		0.965			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1650	0	1761	1853	1575	1770	1798	0	1725	1793	0
Flt Permitted	0.413			0.367			0.526			0.619		
Satd. Flow (perm)	754	1650	0	680	1853	1575	980	1798	0	1124	1793	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	147	263	62	191	11	180	172	52	30	241	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	410	0	62	191	11	180	224	0	30	264	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	D.P+P	NA		Perm	NA	
Protected Phases	5	2			6		3	8			4	
Permitted Phases	2			6		6	4			4		
Detector Phase	5	2		6	6	6	3	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	14.0	12.6		13.4	13.4	
Total Split (s)	15.0	73.0		58.0	58.0	58.0	25.0	72.0		47.0	47.0	
Total Split (%)	10.3%	50.3%		40.0%	40.0%	40.0%	17.2%	49.7%		32.4%	32.4%	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	5.0	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	2.0	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	6.4	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	Min		Min	Min	Min	None	Max		None	None	
Act Effect Green (s)	32.4	32.4		24.6	24.6	24.6	59.5	67.4		49.6	49.6	
Actuated g/C Ratio	0.30	0.30		0.22	0.22	0.22	0.54	0.61		0.45	0.45	

Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

Build (2028) AM Phase 1+2+3 (Full Build)
 Brio Phasing Study

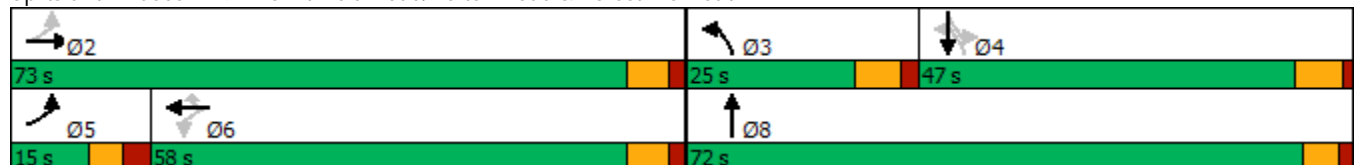
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.10	0.84		0.41	0.46	0.03	0.29	0.20		0.06	0.33	
Control Delay	27.2	52.3		47.4	42.0	35.6	12.8	11.3		21.7	23.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	27.2	52.3		47.4	42.0	35.6	12.8	11.3		21.7	23.2	
LOS	C	D		D	D	D	B	B		C	C	
Approach Delay		50.6			43.0			11.9			23.0	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	16	269		40	125	7	52	64		12	115	
Queue Length 95th (ft)	38	387		85	197	22	111	133		37	229	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	312	1027		330	899	764	716	1102		508	810	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.10	0.40		0.19	0.21	0.01	0.25	0.20		0.06	0.33	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 109.8
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 32.2
 Intersection Capacity Utilization 71.0%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road



Lanes, Volumes, Timings

Build (2028) PM Phase 1+2+3 (Full Build)

9: N Smithfield Road/Horton Road & Forestville Road

Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	180	186	60	96	13	255	237	86	19	183	24
Future Volume (vph)	26	180	186	60	96	13	255	237	86	19	183	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			1%			0%			5%	
Storage Length (ft)	100		0	300		200	225		0	125		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt		0.924				0.850		0.960			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1734	1687	0	1761	1853	1575	1770	1788	0	1725	1783	0
Flt Permitted	0.561			0.305			0.596			0.496		
Satd. Flow (perm)	1024	1687	0	565	1853	1575	1110	1788	0	901	1783	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			55	
Link Distance (ft)		1086			1158			1356			2068	
Travel Time (s)		16.5			17.5			26.4			25.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	200	207	67	107	14	283	263	96	21	203	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	407	0	67	107	14	283	359	0	21	230	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.03	1.03	1.03	1.01	1.01	1.01	1.00	1.00	1.00	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.5	18.5		18.5	18.5	18.5	12.6	12.6		13.4	13.4	
Total Split (s)	20.0	100.0		100.0	100.0	100.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.8%	69.0%		69.0%	69.0%	69.0%	17.2%	17.2%		17.2%	17.2%	
Maximum Green (s)	13.5	93.5		93.5	93.5	93.5	19.4	19.4		18.6	18.6	
Yellow Time (s)	3.5	4.5		4.5	4.5	4.5	3.8	3.8		5.2	5.2	
All-Red Time (s)	3.0	2.0		2.0	2.0	2.0	1.8	1.8		1.2	1.2	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-0.6	-0.6		-1.4	-1.4	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	1.0	6.0		6.0	6.0	6.0	1.0	1.0		1.0	1.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lanes, Volumes, Timings
 9: N Smithfield Road/Horton Road & Forestville Road

Build (2028) PM Phase 1+2+3 (Full Build)

Brio Phasing Study

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	15.0		15.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	35.0		35.0	35.0	35.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	Max	Max		None	None	
Act Effct Green (s)	43.9	43.9		35.8	35.8	35.8	91.1	91.1		91.1	91.1	
Actuated g/C Ratio	0.30	0.30		0.25	0.25	0.25	0.63	0.63		0.63	0.63	
v/c Ratio	0.08	0.80		0.48	0.23	0.04	0.41	0.32		0.04	0.21	
Control Delay	32.2	57.6		58.4	44.2	39.7	17.7	15.2		13.8	13.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	32.2	57.6		58.4	44.2	39.7	17.7	15.2		13.8	13.8	
LOS	C	E		E	D	D	B	B		B	B	
Approach Delay		55.9			48.9			16.3			13.8	
Approach LOS		E			D			B			B	
Queue Length 50th (ft)	20	361		58	87	11	122	144		7	85	
Queue Length 95th (ft)	38	411		100	124	27	252	274		25	170	
Internal Link Dist (ft)		1006			1078			1276			1988	
Turn Bay Length (ft)	100			300		200	225			125		
Base Capacity (vph)	383	1337		370	1214	1031	697	1122		565	1119	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.08	0.30		0.18	0.09	0.01	0.41	0.32		0.04	0.21	

Intersection Summary

Area Type: Other
 Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 34 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 31.3
 Intersection Capacity Utilization 72.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: N Smithfield Road/Horton Road & Forestville Road



Intersection

Intersection Delay, s/veh	26.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	233	52	16	558	11	47	21	3	7	61	33
Future Vol, veh/h	7	233	52	16	558	11	47	21	3	7	61	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	259	58	18	620	12	52	23	3	8	68	37
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	13.4			37.6			11			11		
HCM LOS	B			E			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	66%	2%	3%	7%
Vol Thru, %	30%	80%	95%	60%
Vol Right, %	4%	18%	2%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	71	292	585	101
LT Vol	47	7	16	7
Through Vol	21	233	558	61
RT Vol	3	52	11	33
Lane Flow Rate	79	324	650	112
Geometry Grp	1	1	1	1
Degree of Util (X)	0.148	0.483	0.909	0.199
Departure Headway (Hd)	6.762	5.359	5.037	6.376
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	528	672	722	560
Service Time	4.84	3.411	3.077	4.449
HCM Lane V/C Ratio	0.15	0.482	0.9	0.2
HCM Control Delay	11	13.4	37.6	11
HCM Lane LOS	B	B	E	B
HCM 95th-tile Q	0.5	2.6	12	0.7

Intersection

Intersection Delay, s/veh	50
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	507	91	7	385	13	56	56	14	14	49	13
Future Vol, veh/h	45	507	91	7	385	13	56	56	14	14	49	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	563	101	8	428	14	62	62	16	16	54	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	79.1			22.3			13.1			12		
HCM LOS	F			C			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	44%	7%	2%	18%
Vol Thru, %	44%	79%	95%	64%
Vol Right, %	11%	14%	3%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	126	643	405	76
LT Vol	56	45	7	14
Through Vol	56	507	385	49
RT Vol	14	91	13	13
Lane Flow Rate	140	714	450	84
Geometry Grp	1	1	1	1
Degree of Util (X)	0.274	1.074	0.715	0.168
Departure Headway (Hd)	7.329	5.411	5.902	7.487
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	493	672	617	482
Service Time	5.329	3.462	3.902	5.487
HCM Lane V/C Ratio	0.284	1.063	0.729	0.174
HCM Control Delay	13.1	79.1	22.3	12
HCM Lane LOS	B	F	C	B
HCM 95th-tile Q	1.1	19.6	5.9	0.6

Intersection

Intersection Delay, s/veh 15.7
Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	188	80	8	418	3	131	21	0	4	61	33
Future Vol, veh/h	7	188	80	8	418	3	131	21	0	4	61	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	209	89	9	464	3	146	23	0	4	68	37
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	13			19.9			12.2			10.7		
HCM LOS	B			C			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	86%	3%	2%	4%
Vol Thru, %	14%	68%	97%	62%
Vol Right, %	0%	29%	1%	34%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	152	275	429	98
LT Vol	131	7	8	4
Through Vol	21	188	418	61
RT Vol	0	80	3	33
Lane Flow Rate	169	306	477	109
Geometry Grp	1	1	1	1
Degree of Util (X)	0.3	0.457	0.701	0.187
Departure Headway (Hd)	6.392	5.385	5.298	6.193
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	559	666	682	575
Service Time	4.467	3.449	3.352	4.278
HCM Lane V/C Ratio	0.302	0.459	0.699	0.19
HCM Control Delay	12.2	13	19.9	10.7
HCM Lane LOS	B	B	C	B
HCM 95th-tile Q	1.3	2.4	5.7	0.7

Intersection

Intersection Delay, s/veh	28.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	350	179	2	292	8	111	56	5	5	49	13
Future Vol, veh/h	45	350	179	2	292	8	111	56	5	5	49	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	389	199	2	324	9	123	62	6	6	54	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	41.9			15.9			13.8			11.3		
HCM LOS	E			C			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	65%	8%	1%	7%
Vol Thru, %	33%	61%	97%	73%
Vol Right, %	3%	31%	3%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	172	574	302	67
LT Vol	111	45	2	5
Through Vol	56	350	292	49
RT Vol	5	179	8	13
Lane Flow Rate	191	638	336	74
Geometry Grp	1	1	1	1
Degree of Util (X)	0.364	0.927	0.551	0.146
Departure Headway (Hd)	6.859	5.333	5.908	7.059
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	526	682	614	508
Service Time	4.881	3.333	3.908	5.091
HCM Lane V/C Ratio	0.363	0.935	0.547	0.146
HCM Control Delay	13.8	41.9	15.9	11.3
HCM Lane LOS	B	E	C	B
HCM 95th-tile Q	1.7	12.5	3.4	0.5

Intersection

Intersection Delay, s/veh 40.7
Intersection LOS E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	7	233	80	16	558	11	131	21	3	7	61	33
Future Vol, veh/h	7	233	80	16	558	11	131	21	3	7	61	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	259	89	18	620	12	146	23	3	8	68	37
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	17.3			65.5			14.1			12.3		
HCM LOS	C			F			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	85%	2%	3%	7%
Vol Thru, %	14%	73%	95%	60%
Vol Right, %	2%	25%	2%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	155	320	585	101
LT Vol	131	7	16	7
Through Vol	21	233	558	61
RT Vol	3	80	11	33
Lane Flow Rate	172	356	650	112
Geometry Grp	1	1	1	1
Degree of Util (X)	0.346	0.59	1.024	0.223
Departure Headway (Hd)	7.242	5.972	5.672	7.143
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	494	601	644	501
Service Time	5.315	4.031	3.672	5.225
HCM Lane V/C Ratio	0.348	0.592	1.009	0.224
HCM Control Delay	14.1	17.3	65.5	12.3
HCM Lane LOS	B	C	F	B
HCM 95th-tile Q	1.5	3.8	16.6	0.8

Intersection

Intersection Delay, s/veh	93.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	45	507	179	7	385	13	111	56	14	14	49	13
Future Vol, veh/h	45	507	179	7	385	13	111	56	14	14	49	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	563	199	8	428	14	123	62	16	16	54	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	157.9			26.6			15.9			13		
HCM LOS	F			D			C			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	61%	6%	2%	18%
Vol Thru, %	31%	69%	95%	64%
Vol Right, %	8%	24%	3%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	181	731	405	76
LT Vol	111	45	7	14
Through Vol	56	507	385	49
RT Vol	14	179	13	13
Lane Flow Rate	201	812	450	84
Geometry Grp	1	1	1	1
Degree of Util (X)	0.4	1.282	0.753	0.176
Departure Headway (Hd)	7.802	5.682	6.475	8.247
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	465	642	563	437
Service Time	5.802	3.745	4.475	6.247
HCM Lane V/C Ratio	0.432	1.265	0.799	0.192
HCM Control Delay	15.9	157.9	26.6	13
HCM Lane LOS	C	F	D	B
HCM 95th-tile Q	1.9	31.6	6.6	0.6

Intersection

Intersection Delay, s/veh	18.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	208	80	8	457	3	131	21	0	4	61	33
Future Vol, veh/h	7	208	80	8	457	3	131	21	0	4	61	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	231	89	9	508	3	146	23	0	4	68	37
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	14.1			24.7			12.7			11.1		
HCM LOS	B			C			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	86%	2%	2%	4%
Vol Thru, %	14%	71%	98%	62%
Vol Right, %	0%	27%	1%	34%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	152	295	468	98
LT Vol	131	7	8	4
Through Vol	21	208	457	61
RT Vol	0	80	3	33
Lane Flow Rate	169	328	520	109
Geometry Grp	1	1	1	1
Degree of Util (X)	0.309	0.501	0.776	0.197
Departure Headway (Hd)	6.594	5.503	5.369	6.515
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	540	649	671	554
Service Time	4.693	3.586	3.441	4.515
HCM Lane V/C Ratio	0.313	0.505	0.775	0.197
HCM Control Delay	12.7	14.1	24.7	11.1
HCM Lane LOS	B	B	C	B
HCM 95th-tile Q	1.3	2.8	7.4	0.7

Intersection

Intersection Delay, s/veh	39.6
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	392	179	2	318	8	111	56	5	5	49	13
Future Vol, veh/h	45	392	179	2	318	8	111	56	5	5	49	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	436	199	2	353	9	123	62	6	6	54	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	61.4			17.6			14.2			11.6		
HCM LOS	F			C			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	65%	7%	1%	7%
Vol Thru, %	33%	64%	97%	73%
Vol Right, %	3%	29%	2%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	172	616	328	67
LT Vol	111	45	2	5
Through Vol	56	392	318	49
RT Vol	5	179	8	13
Lane Flow Rate	191	684	364	74
Geometry Grp	1	1	1	1
Degree of Util (X)	0.37	1.014	0.599	0.149
Departure Headway (Hd)	7.108	5.331	6.028	7.356
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	510	678	601	491
Service Time	5.108	3.418	4.028	5.356
HCM Lane V/C Ratio	0.375	1.009	0.606	0.151
HCM Control Delay	14.2	61.4	17.6	11.6
HCM Lane LOS	B	F	C	B
HCM 95th-tile Q	1.7	16.5	4	0.5

Intersection

Intersection Delay, s/veh	50.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	7	253	80	16	597	11	131	21	3	7	61	33
Future Vol, veh/h	7	253	80	16	597	11	131	21	3	7	61	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	281	89	18	663	12	146	23	3	8	68	37
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	18.3			82.6			14.3			12.4		
HCM LOS	C			F			B			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	85%	2%	3%	7%
Vol Thru, %	14%	74%	96%	60%
Vol Right, %	2%	24%	2%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	155	340	624	101
LT Vol	131	7	16	7
Through Vol	21	253	597	61
RT Vol	3	80	11	33
Lane Flow Rate	172	378	693	112
Geometry Grp	1	1	1	1
Degree of Util (X)	0.341	0.615	1.081	0.219
Departure Headway (Hd)	7.447	6.082	5.615	7.366
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	486	597	645	490
Service Time	5.447	4.082	3.682	5.366
HCM Lane V/C Ratio	0.354	0.633	1.074	0.229
HCM Control Delay	14.3	18.3	82.6	12.4
HCM Lane LOS	B	C	F	B
HCM 95th-tile Q	1.5	4.2	19.6	0.8

Intersection

Intersection Delay, s/veh 115.8
Intersection LOS F


















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	45	549	179	7	411	13	111	56	14	14	49	13
Future Vol, veh/h	45	549	179	7	411	13	111	56	14	14	49	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	610	199	8	457	14	123	62	16	16	54	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	196.3			31.2			16.4			13.4		
HCM LOS	F			D			C			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	61%	6%	2%	18%
Vol Thru, %	31%	71%	95%	64%
Vol Right, %	8%	23%	3%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	181	773	431	76
LT Vol	111	45	7	14
Through Vol	56	549	411	49
RT Vol	14	179	13	13
Lane Flow Rate	201	859	479	84
Geometry Grp	1	1	1	1
Degree of Util (X)	0.405	1.374	0.803	0.178
Departure Headway (Hd)	8.025	5.76	6.601	8.522
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	453	627	551	424
Service Time	6.025	3.826	4.601	6.522
HCM Lane V/C Ratio	0.444	1.37	0.869	0.198
HCM Control Delay	16.4	196.3	31.2	13.4
HCM Lane LOS	C	F	D	B
HCM 95th-tile Q	1.9	37.4	7.8	0.6

Lanes, Volumes, Timings
5: Old Crews Road & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)













Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	289	80	16	639	11	131	21	3	7	61	33
Future Volume (vph)	7	289	80	16	639	11	131	21	3	7	61	33
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. 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
Frt			0.850		0.998			0.998			0.956	
Flt Protected		0.999			0.999			0.959			0.996	
Satd. Flow (prot)	0	1861	1583	0	1857	0	0	1783	0	0	1774	0
Flt Permitted		0.982			0.989			0.753			0.971	
Satd. Flow (perm)	0	1829	1583	0	1839	0	0	1400	0	0	1729	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		3001			2518			2707			1919	
Travel Time (s)		45.5			38.2			41.0			29.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	321	89	18	710	12	146	23	3	8	68	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	329	89	0	740	0	0	172	0	0	113	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			0			0	
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
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase	2	2	2	6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		14.0	14.0		14.0	14.0	
Total Split (s)	54.0	54.0	54.0	54.0	54.0		26.0	26.0		26.0	26.0	
Total Split (%)	67.5%	67.5%	67.5%	67.5%	67.5%		32.5%	32.5%		32.5%	32.5%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0			-2.0			-2.0	
Total Lost Time (s)		5.0	5.0		5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effect Green (s)		34.3	34.3		34.3			14.9			14.9	
Actuated g/C Ratio		0.58	0.58		0.58			0.25			0.25	
v/c Ratio		0.31	0.10		0.70			0.49			0.26	

Lanes, Volumes, Timings
5: Old Crews Road & Buffalo Road

Build (2028) AM Phase 1+2+3 (Full Build)

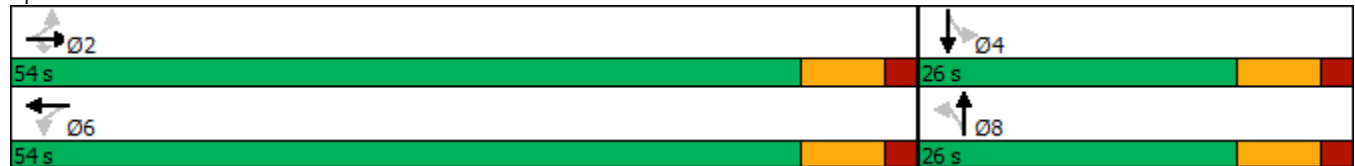
Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		7.8	6.5		13.7			25.9			21.2	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		7.8	6.5		13.7			25.9			21.2	
LOS		A	A		B			C			C	
Approach Delay		7.6			13.7			25.9			21.2	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)		52	12		159			46			28	
Queue Length 95th (ft)		112	34		332			132			87	
Internal Link Dist (ft)		2921			2438			2627			1839	
Turn Bay Length (ft)			150									
Base Capacity (vph)		1537	1330		1545			512			632	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.21	0.07		0.48			0.34			0.18	

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 59.6
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 14.0
 Intersection Capacity Utilization 70.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

















Splits and Phases: 5: Old Crews Road & Buffalo Road



Lanes, Volumes, Timings
5: Old Crews Road & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)













Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	629	179	7	483	13	111	56	14	14	49	13
Future Volume (vph)	45	629	179	7	483	13	111	56	14	14	49	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.972			0.997			0.989			0.977	
Flt Protected		0.997			0.999			0.970			0.991	
Satd. Flow (prot)	0	1805	0	0	1855	0	0	1787	0	0	1804	0
Flt Permitted		0.951			0.987			0.803			0.927	
Satd. Flow (perm)	0	1722	0	0	1833	0	0	1479	0	0	1687	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			3			5			12	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		3001			2518			2707			1919	
Travel Time (s)		45.5			38.2			41.0			29.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	699	199	8	537	14	123	62	16	16	54	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	948	0	0	559	0	0	201	0	0	84	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			0			0	
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
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	57.0	57.0		57.0	57.0		23.0	23.0		23.0	23.0	
Total Split (%)	71.3%	71.3%		71.3%	71.3%		28.8%	28.8%		28.8%	28.8%	
Maximum Green (s)	50.0	50.0		50.0	50.0		16.0	16.0		16.0	16.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		46.5			46.5			15.4			15.4	
Actuated g/C Ratio		0.64			0.64			0.21			0.21	
v/c Ratio		0.84			0.47			0.63			0.23	
Control Delay		19.1			8.3			35.8			23.6	

Lanes, Volumes, Timings
5: Old Crews Road & Buffalo Road

Build (2028) PM Phase 1+2+3 (Full Build)

Brio Phasing Study

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		19.1			8.3			35.8			23.6	
LOS		B			A			D			C	
Approach Delay		19.1			8.3			35.8			23.6	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)		303			120			86			29	
Queue Length 95th (ft)		#570			188			157			66	
Internal Link Dist (ft)		2921			2438			2627			1839	
Turn Bay Length (ft)												
Base Capacity (vph)		1271			1343			378			436	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.75			0.42			0.53			0.19	

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 72.1
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 17.8
 Intersection Capacity Utilization 96.1%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: B
 ICU Level of Service F

Splits and Phases: 5: Old Crews Road & Buffalo Road





STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

June 16, 2021

Buffaloe Road Assemblage

Traffic Impact Analysis Review Report Congestion Management Section

TIA Project: SC-2021-136
Division: 5
County: Wake



Doumit Y. Ishak, Regional Engineer
Clarence B. Bunting, IV, P.E. Project Engineer
Braden M. Walker, P.E. Project Design Engineer

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750 N. GREENFIELD PARKWAY
GARNER, NC 27529

Website: www.ncdot.gov

Buffaloe Road Assemblage

SC-2021-136

Knightdale

Wake County

Per your request, the Congestion Management Section (CMS) of the Transportation Mobility and Safety Division has completed a review of the subject site. The comments and recommendations contained in this review are based on data for background conditions presented in the Traffic Impact Analysis (TIA) and are subject to the approval of the local District Engineer's Office and appropriate local authorities.

Date Initially Received by CMS	05/18/21	Date of Site Plan	02/16/21
Date of Complete Information	05/18/21	Date of Sealed TIA	05/18/21

Proposed Development

The TIA assumes the development is to be completed by 2027 and consist of the following:

Land Use	Land Use Code	Size
Multifamily Housing (Low-Rise)	220	514 d.u.
Single-Family Detached Housing	210	799 d.u.

Trip Generation - Unadjusted Volumes During a Typical Weekday

	IN	OUT	TOTAL
AM Peak Hour	195	603	798
PM Peak Hour	631	370	1,001
Daily Trips			10,890

General Reference

For reference to various documents applicable to this review please reference the following link: <http://www.ncdot.org/doh/preconstruct/traffic/tepl/Topics/C-37/C-37.html>

Once the driveway permit has been approved and issued, a copy of the final driveway permit requirements should be forwarded to this office. If we can provide further assistance, please contact the Congestion Management Section.

Improvements By Others

The analysis includes background improvements by others. If these improvements are not in place at the time of construction, the site should provide these improvements or analysis demonstrating mitigation is not necessary.

Signalization









We defer to the District Engineer, the Division Traffic Engineer, and the Regional Traffic Engineer for final decisions regarding signalization.

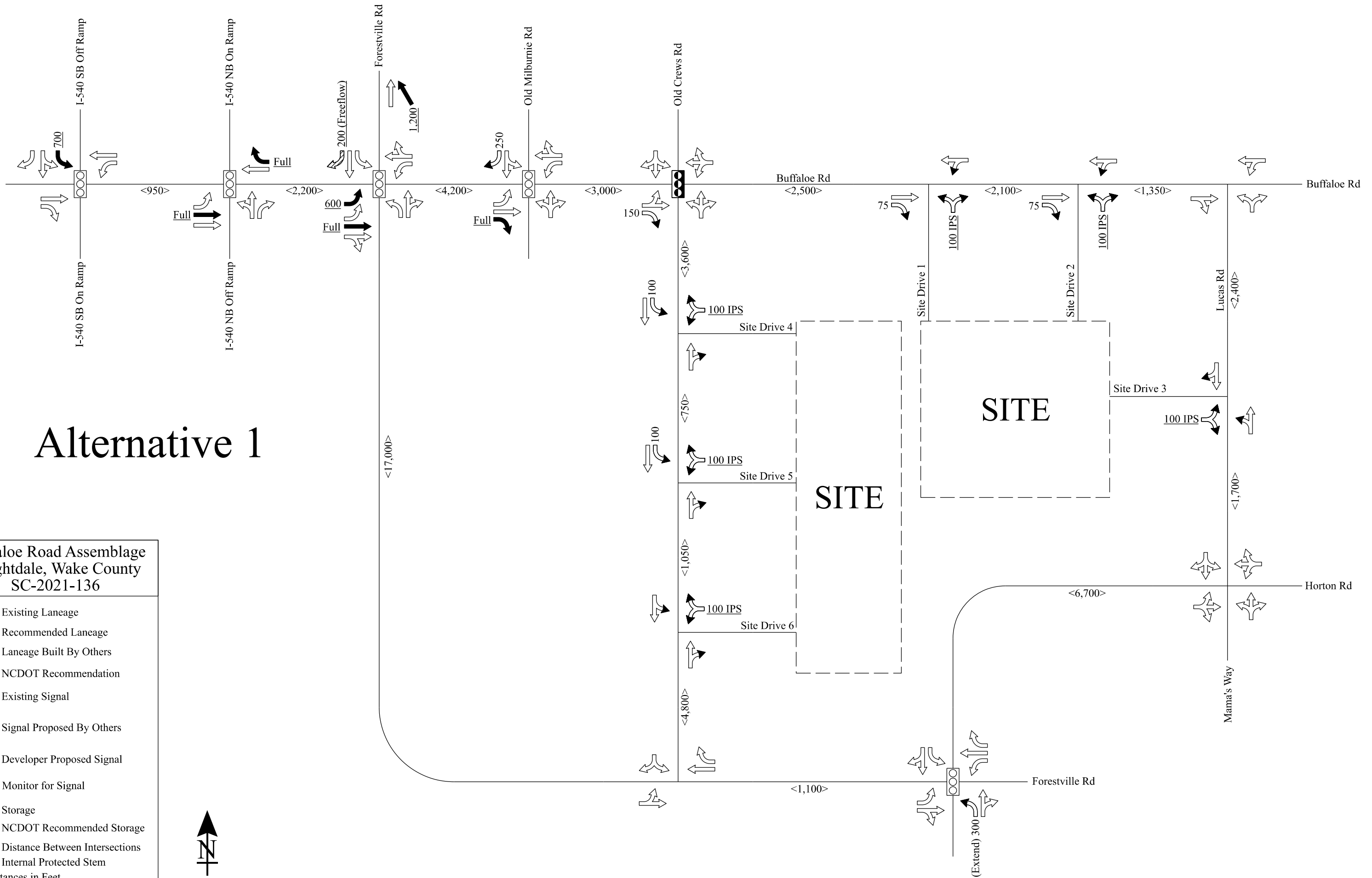
Developer Coordination

Multiple Developments are proposed in this area. To minimize construction impacts, it is preferable that the developments coordinate.

Alternative 1









Buffaloe Road Assemblage Knightdale, Wake County SC-2021-136

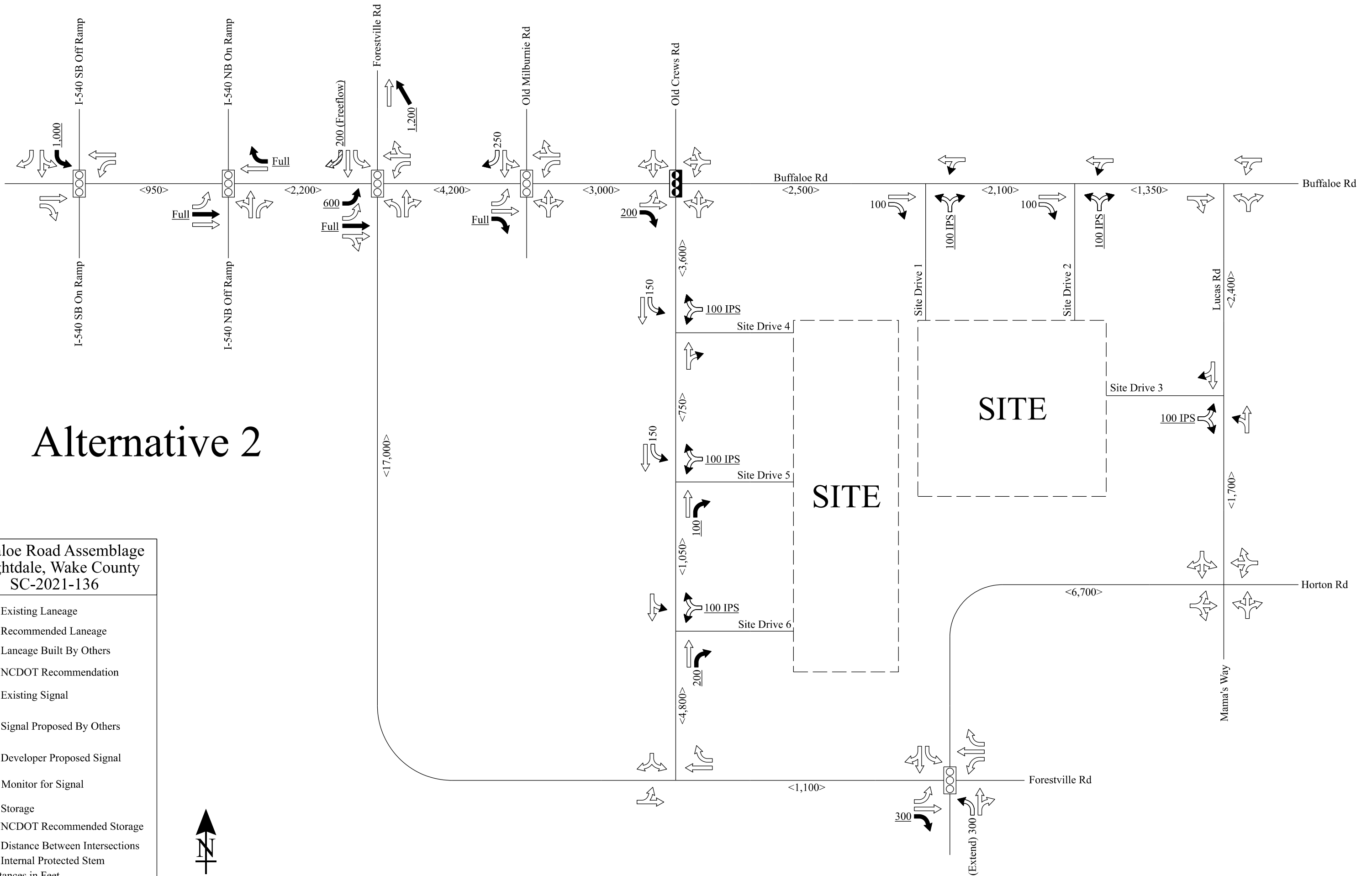
-  Existing Laneage
-  Recommended Laneage
-  Laneage Built By Others
-  NCDOT Recommendation
-  Existing Signal
-  Signal Proposed By Others
-  Developer Proposed Signal
-  Monitor for Signal
- XXX Storage
- XXX NCDOT Recommended Storage
- <XXX> Distance Between Intersections
- IPS Internal Protected Stem
- All Distances in Feet
- Drawing Not to Scale



Alternative 2

Buffaloe Road Assemblage
Knightdale, Wake County
SC-2021-136

-  Existing Laneage
-  Recommended Laneage
-  Laneage Built By Others
-  NCDOT Recommendation
-  Existing Signal
-  Signal Proposed By Others
-  Developer Proposed Signal
-  Monitor for Signal
- XXX Storage
- XXX NCDOT Recommended Storage
- <XXX> Distance Between Intersections
- IPS Internal Protected Stem
- All Distances in Feet
- Drawing Not to Scale





STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

December 30, 2021

River Towne Phasing

Traffic Impact Analysis Review Report Congestion Management Section

TIA Project: SC-2021-052R1
Division: 5
County: Wake



Doumit Y. Ishak, Regional Engineer
Clarence B. Bunting, IV, P.E. Project Engineer
Braden M. Walker, P.E. Project Design Engineer

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
TRANSPORTATION MOBILITY & SAFETY DIVISION
1561 MAIL SERVICE CENTER
RALEIGH, NC 27699-1561

Telephone: (919) 814-5000
Fax: (919) 771-2745
Customer Service: 1-877-368-4968

Location:
750 N. GREENFIELD PARKWAY
GARNER, NC 27529

Website: www.ncdot.gov

River Towne Phasing

SC-2021-052R1

Raleigh

Wake County

Per your request, the Congestion Management Section (CMS) of the Transportation Mobility and Safety Division has completed a review of the subject site. The comments and recommendations contained in this review are based on data for background conditions presented in the Traffic Impact Analysis (TIA) and are subject to the approval of the local District Engineer's Office and appropriate local authorities.

Date Initially Received by CMS	11/29/21	Date of Site Plan	N/A
Date of Complete Information	11/29/21	Date of Sealed TIA	11/24/21

Proposed Development

The TIA assumes the development is to be completed by 2027 and consist of the following:

Land Use	Land Use Code	Size
Single Family Detached Housing	210	900 d.u.

Trip Generation - Unadjusted Volumes During a Typical Weekday

	IN	OUT	TOTAL
AM Peak Hour	161	483	644
PM Peak Hour	527	310	837
Daily Trips			7,800

General Reference

For reference to various documents applicable to this review please reference the following link: <http://www.ncdot.org/doh/preconstruct/traffic/tepl/Topics/C-37/C-37.html>

Once the driveway permit has been approved and issued, a copy of the final driveway permit requirements should be forwarded to this office. If we can provide further assistance, please contact the Congestion Management Section.

Improvements By Others

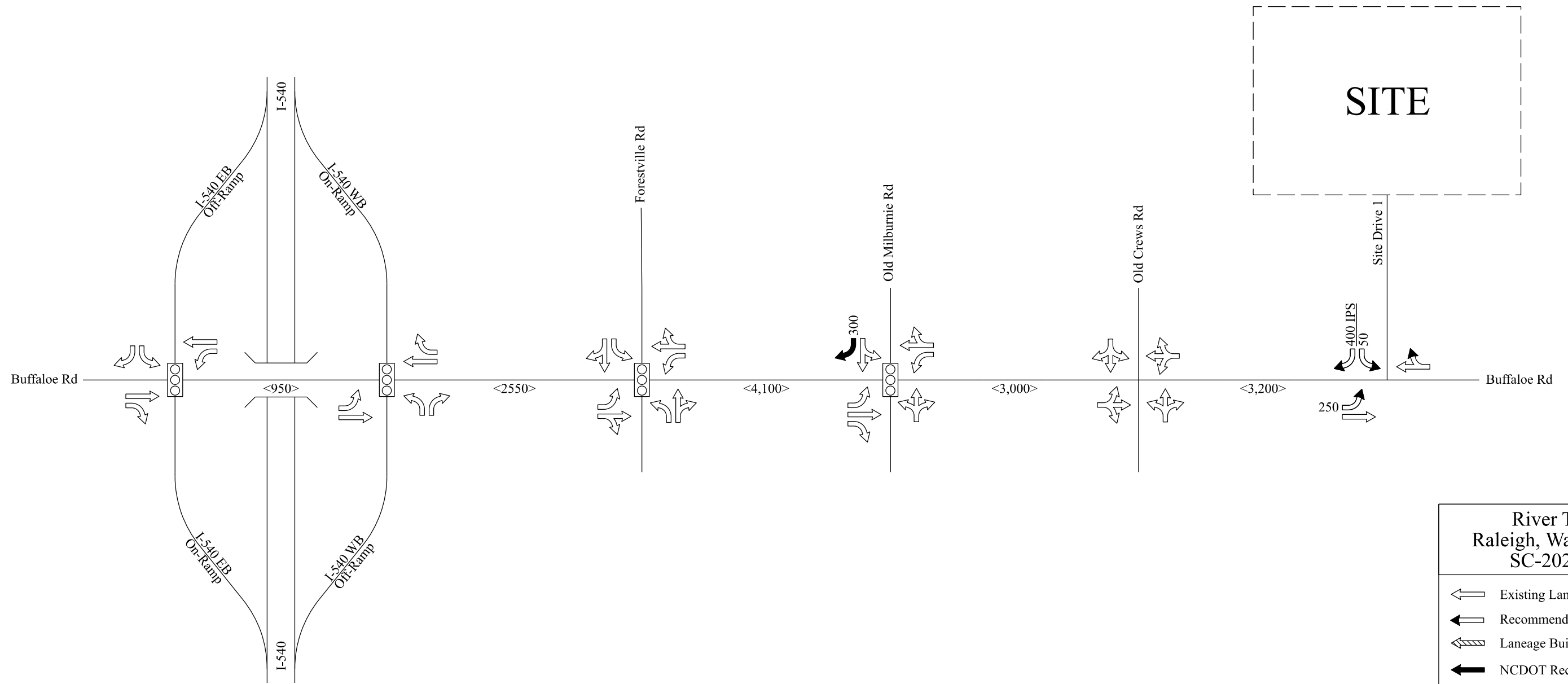
The analysis includes background improvements by others. If these improvements are not in place at the time of construction, the site should provide these improvements or analysis demonstrating mitigation is not necessary.

Signalization

We defer to the District Engineer, the Division Traffic Engineer, and the Regional Traffic Engineer for final decisions regarding signalization.

Developer Coordination

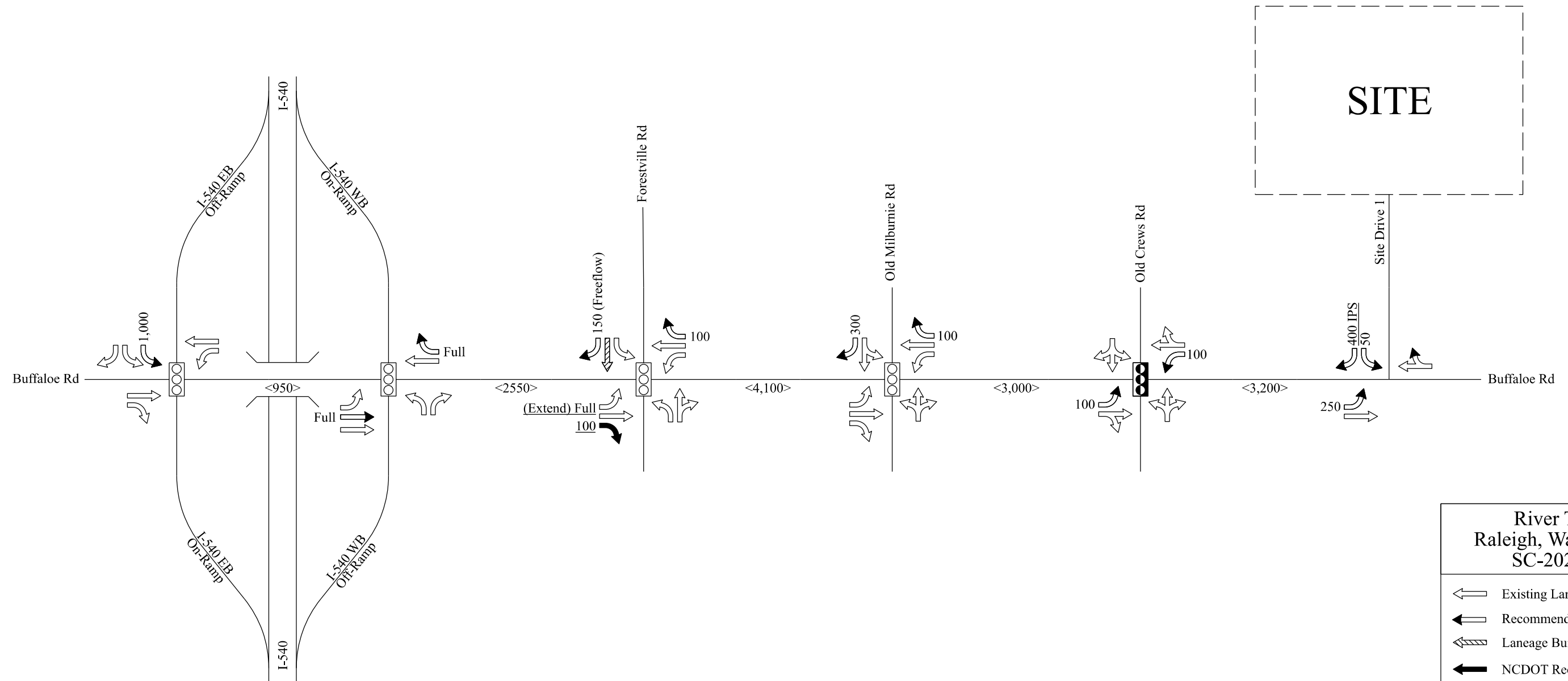
Multiple Developments are proposed in this area. To minimize construction impacts, it is preferable is the developments coordinate construction improvements.



Phase 1



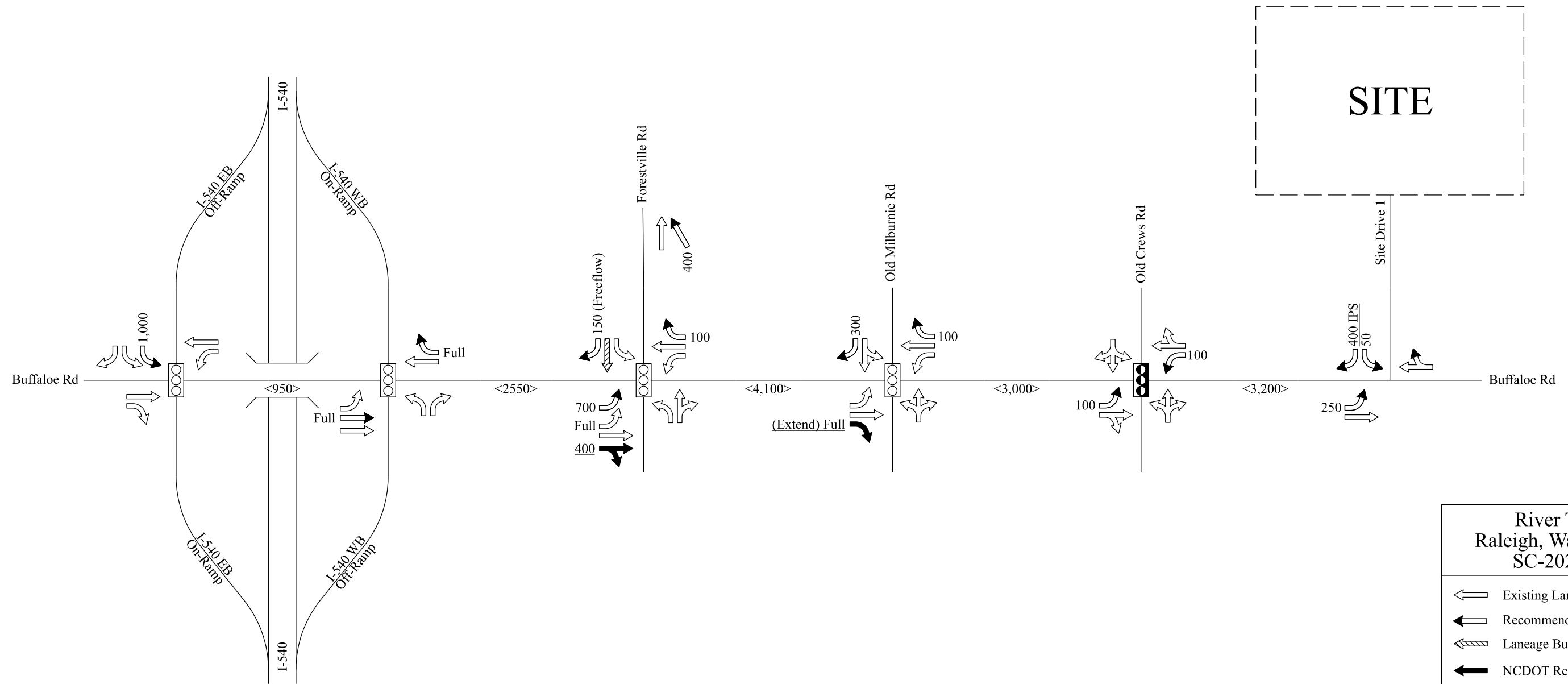
River Towne Raleigh, Wake County SC-2021-052	
	Existing Laneage
	Recommended Laneage
	Laneage Built By Others
	NCDOT Recommendation
	Existing Signal
	Signal Proposed By Others
	Developer Proposed Signal
	Monitor for Signal
XXX	Storage
<u>XXX</u>	NCDOT Recommended Storage
<XXX>	Distance Between Intersections
IPS	Internal Protected Stem
All Distances in Feet	
Drawing Not to Scale	



Phase 2



River Towne Raleigh, Wake County SC-2021-052	
	Existing Laneage
	Recommended Laneage
	Laneage Built By Others
	NCDOT Recommendation
	Existing Signal
	Signal Proposed By Others
	Developer Proposed Signal
	Monitor for Signal
XXX	Storage
<u>XXX</u>	NCDOT Recommended Storage
<XXX>	Distance Between Intersections
IPS	Internal Protected Stem
All Distances in Feet	
Drawing Not to Scale	



Phase 3

- River Towne
Raleigh, Wake County
SC-2021-052**
- Existing Laneage
 - Recommended Laneage
 - Laneage Built By Others
 - NCDOT Recommendation
 - Existing Signal
 - Signal Proposed By Others
 - Developer Proposed Signal
 - Monitor for Signal
 - XXX Storage
 - XXX NCDOT Recommended Storage
 - <XXX> Distance Between Intersections
 - IPS Internal Protected Stem
 - All Distances in Feet
 - Drawing Not to Scale



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

April 23, 2021

Old Milburnie Road Residential

Traffic Impact Analysis Review Report Congestion Management Section

TIA Project: SC-2018-124R1
Division: 5
County: Wake



Doumit Y. Ishak, Regional Engineer
Clarence B. Bunting, IV, P.E. Project Engineer
Braden M. Walker, P.E. Project Design Engineer

Mailing Address:
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750 N. GREENFIELD PARKWAY
GARNER, NC 27529

Website: www.ncdot.gov

Old Milburnie Road Residential

SC-2018-124R1

Knightdale

Wake County

Per your request, the Congestion Management Section (CMS) of the Transportation Mobility and Safety Division has completed a review of the subject site. The comments and recommendations contained in this review are based on data for background conditions presented in the Traffic Impact Analysis (TIA) and are subject to the approval of the local District Engineer's Office and appropriate local authorities.

Date Initially Received by CMS	03/25/21	Date of Site Plan	01/18/21
Date of Complete Information	03/25/21	Date of Sealed TIA	03/25/21

Proposed Development

The TIA assumes the development is to be completed by 2025 and consist of the following:

Land Use	Land Use Code	Size
Single-Family Detached Housing	210	177 d.u.
Multi-Family Housing (Low-Rise)	220	93 d.u.

Trip Generation - Unadjusted Volumes During a Typical Weekday

	IN	OUT	TOTAL
AM Peak Hour	42	133	175
PM Peak Hour	146	85	231
Daily Trips			2,430

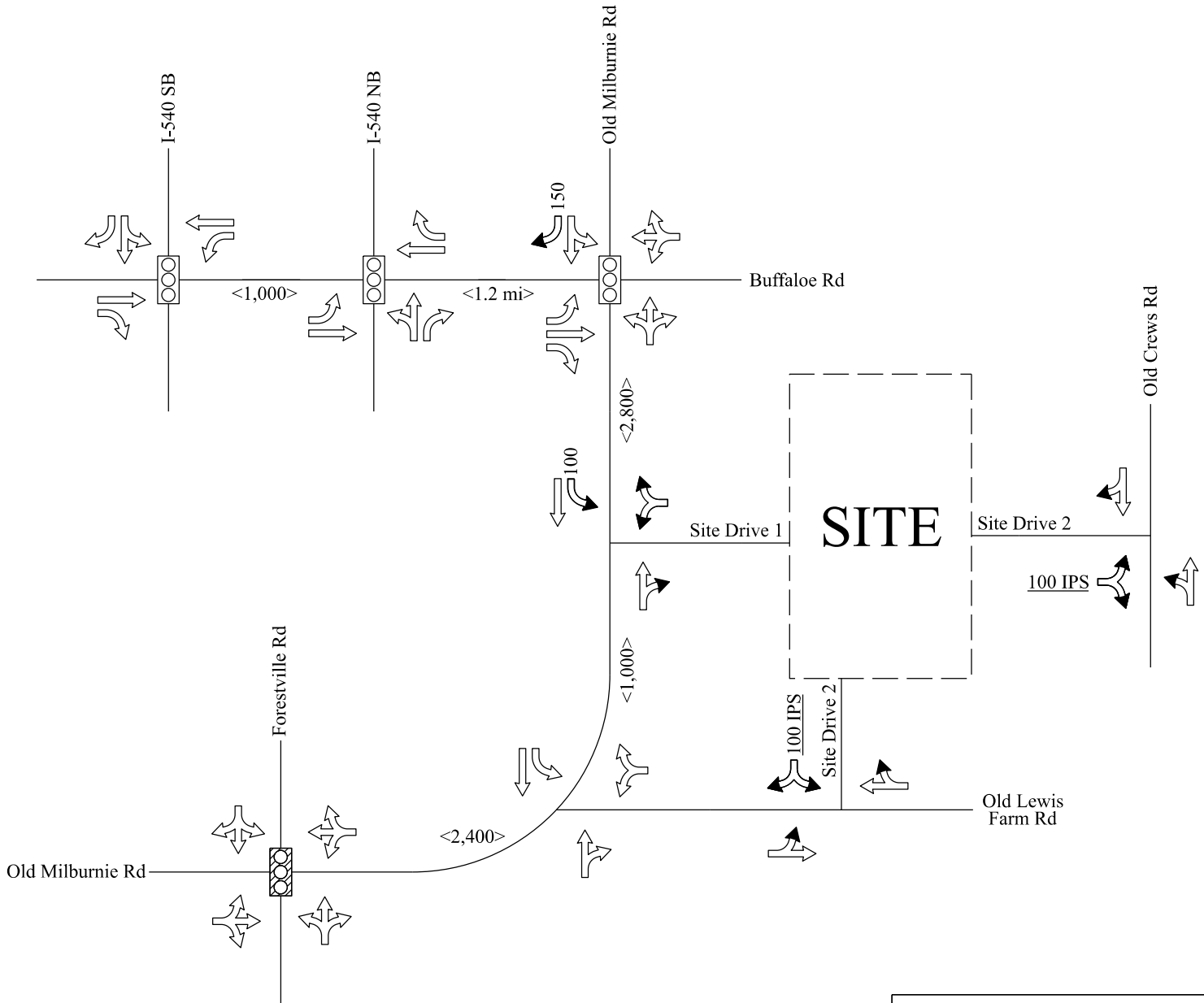
General Reference

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






Once the driveway permit has been approved and issued, a copy of the final driveway permit requirements should be forwarded to this office. If we can provide further assistance, please contact the Congestion Management Section.

Developer Coordination

Multiple Developments are proposed in this area. To minimize construction impacts, it is preferable is the developments coordinate construction improvements.



**Old Milburnie Rd Residential
Knightdale, Wake County
SC-2018-124R1**

-  Existing Laneage
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