

Addendum

Project:	East John Street/Old Monroe Road Improvement Project (STIP No. U-4714)
Subject:	Addendum to Traffic Operations Technical Memorandum
Date:	June 11, 2018



North Carolina Department of Transportation (NCDOT) proposes to widen the existing two-lane East John Street-Old Monroe Road to a multi-lane facility from Trade Street (SR 3448-SR 3474) in the Town of Matthews in Mecklenburg County to Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail in Union County. Atkins analyzed traffic operation of the study area roadway network for year 2035 traffic forecast within the project limits and summarized the analysis results in the *Build Traffic Operation Technical Memorandum* (July 2015). Since the completion of this technical memorandum, NCDOT Transportation Planning Branch has updated traffic forecast for the study area corridor for year 2040 (February 26, 2018). With the publication of the 2040 Forecast, NCDOT Division 10 has requested Atkins to update the traffic analysis results for 2040 traffic volume.

The following two alternatives were analyzed for 2040 traffic conditions:

- Alternative 1-Four-Lane Median Divided
- Alternative 2-Four-Lane Superstreet

This Addendum summarizes the traffic operation analysis results for these two alternatives for 2040 Traffic volumes, provides a comparison with 2035 analysis results and recommends a preferred alternative.

2040 Vs 2035 Volume Forecast Comparison

NCDOT Transportation Planning Branch (TPB) has provided an updated traffic forecast for the study area roadway network for Year 2040 Build Condition (February 26, 2018). This forecast provides annual average daily traffic (AADT) volumes, design hourly volume factors, directional split percentages, PM direction of flow and tractor/semi-trailer heavy vehicle percentages. The 2040 traffic forecast is presented in Attachment A of this addendum.

A comparison of traffic forecast between 2035 and 2040 build condition is presented in Figure 1. Year 2035 AADT and quadrant volumes are presented either in orange highlight or in green highlight. Orange highlights represent 2035 volumes that are higher than 2040 forecast and therefore identifies locations where volume will decrease in 2040. Green highlights represent 2035 volumes that are lower than 2040 forecast and therefore, identifies locations where volume will increase in 2040. As can be seen from Figure 1, volume is expected to decrease in year 2040 at most locations including quadrant turning movements.

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RS&H has provided AM and PM peak hour volume breakouts along the study area intersections for the 2040 traffic forecast. These peak hour volumes were balanced as needed along the study area and used in the analysis. The Intersection Analysis Utility (IAU) breakout reports are included in Attachment A.

Traffic Operation Analysis Methodology

The Synchro files used to analyze traffic operation for 2035 traffic conditions were modified to analyze traffic operation for 2040 forecasted volumes. The following modifications were made in the Synchro models:

- Charles Barkley Way is added in the network. Previously, a median U-turn location was proposed in the vicinity of Charles Barkley Way. Because of the proximity of the previously proposed U-turn location to the Charles Barkley Way and the magnitude of turn volumes at Charles Barkley Way, it is proposed that median U-turn location be discarded and Charles Barkley Way be converted into a full movement signalized intersection.
- McKee Road Extension is added in the model.
- Chestnut Connector is added in the network.
- Traffic volume estimation were available for the following driveways and side streets and therefore, they were included in the analysis (2035 Build Condition). However, the 2040 Traffic Forecast did not include these side streets/driveways and based on the direction received from NCDOT Congestion Management Unit, these side streets are eliminated from the network:
 - Alternative 1: Four-Lane Median Divided
 - Edgeland Drive
 - Greylock Ridge Road and Matthews Sportsplex
 - Council Place
 - Friendship Drive (both sideways omitted)
 - Campus Ridge Road
 - Kerry Greens Drive
 - Morningside Meadow Lane
 - Radiator Road
 - Alternative 2: Four-Lane Superstreet
 - U-Turn/ Post Office
 - Keith Drive
 - Clearbrook Road
 - Greylock Ridge Road and Mathews Sports Complex
 - Council Place
 - Campus Ridge Road (Ridge Road)
 - Kerry Greens Drive
 - Sweetbriar Drive
 - Morning Meadow Lane
 - Poplar glen Drive

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- Kennerly Drive
- Radiator Road

Operation Analysis Results

Traffic operation analysis results for Alternative 1 and Alternative 2 are presented below:

Alternative 1: Four-Lane Median Divided

Intersection Level of Service (LOS) at the study area roadway network during the AM and PM peak hours are presented in Figure 2. Figure 2 also shows the roadway geometry and the peak hour volumes used in the analysis. Detail analysis results for the study area intersections are presented in Table 1. Queue analysis results are presented in Table 2.

Table 1: Year 2040 Build Alternative 1 Capacity Analysis Results

Intersection	MOE	Over-all	Eastbound			Westbound			Northbound			Southbound		
			L/U	T	R	L/U	T	R	L/U	T	R	L/U	T	R
Trade Street (Signal)	LOS	E (E)	F (F)	D (F)	E (F)	E (D)	E (E)	F (E)	D (D)	F (F)	D (D)	C (C)		
	Delay	69.2 (73.8)	102.4 (101.1)	38.0 (85.3)	65.8 (151.5)	76.5 (41.0)	65.5 (62.2)	119.6 (79.4)	43.4 (48.4)	126.3 (114.8)	41.7 (35.5)	30.9 (25.0)		
	v/c	1.12 (1.16)	0.86 (0.85)	0.77 (1.07)	0.85 (1.16)	1.10 (0.97)	0.51 (0.39)	0.95 (0.69)	0.63 (0.65)	1.12 (1.11)	0.23 (0.24)	0.21 (0.18)		
Charles Buckley Way (Signal) ¹	LOS	A (A)	B (B)	A (A)	-	-	A (A)	-	-	-	-	C (C)	-	D (C)
	Delay	6.3 (7.7)	11.4 (12.4)	2.6 (5.0)	-	-	6.5 (8.3)	-	-	-	-	30.8 (29.4)	-	27.9 (25.8)
	v/c	0.78 (0.73)	0.48 (0.62)	0.59 (0.73)	-	-	0.78 (0.65)	-	-	-	-	0.50 (0.45)	-	0.36 (0.26)
EB U-Turn east of Charles Buckley Way (Unsignalized)	LOS	B (B)	-	-	-	-	-	-	-	-	-	B (B)	-	-
	Delay	10.7 (13.7)	-	-	-	-	-	-	-	-	-	10.7 (13.7)	-	-
	v/c	0.03 (0.03)	-	-	-	-	-	-	-	-	-	0.03 (0.03)	-	-
WB U-Turn east of Charles Buckley Way (Unsignalized)	LOS	C (C)	-	-	-	-	-	-	C (C)	-	-	-	-	-
	Delay	24.9 (18.0)	-	-	-	-	-	-	24.9 (18.0)	-	-	-	-	-
	v/c	0.22 (0.08)	-	-	-	-	-	-	0.22 (0.08)	-	-	-	-	-
I-485 Inner Ramps (Signal)	LOS	B (B)	-	B (B)	A (A)	-	B (B)	A (A)	-	-	-	D (D)	-	C (B)
	Delay	17.8 (16.3)	-	19.4 (16.1)	0.2 (0.2)	-	16.6 (13.3)	0.2 (0.2)	-	-	-	42.8 (45.4)	-	20.2 (18.6)
	v/c	0.89 (0.93)	-	0.72 (0.93)	0.20 (0.20)	-	0.88 (0.72)	0.25 (0.19)	-	-	-	0.89 (0.90)	-	0.52 (0.41)

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Table 1: Year 2040 Build Alternative 1 Capacity Analysis Results

Intersection	MOE	Over-all	Eastbound			Westbound			Northbound			Southbound		
			L/U	T	R	L/U	T	R	L/U	T	R	L/U	T	R
I-485 Outer Ramps (Signal)	LOS	B (A)	-	A (A)	A (A)	-	B (A)	A (A)	C (C)	-	C (C)	-	-	-
	Delay	10.1 (8.4)	-	7.9 (6.9)	0.2 (0.2)	-	10.3 (5.2)	0.1 (0.3)	25.9 (24.0)	-	28.9 (31.7)	-	-	-
	v/c	0.75 (0.81)	-	0.65 (0.81)	0.21 (0.27)	-	0.75 (0.60)	0.30 (0.29)	0.53 (0.48)	-	0.62 (0.72)	-	-	-
Proposed McKee Road Extension (Signal)	LOS	D (D)	F (E)	C (D)	B (B)	F (F)	D (C)	E (F)	D (D)	D (E)	D (E)	D (E)	E (E)	
	Delay	44.4 (41.1)	108.5 (59.3)	27.9 (39.6)	10.2 (10.3)	85.6 (108.1)	46.8 (20.4)	66.6 (91.3)	50.2 (54.9)	53.1 (55.1)	54.8 (76.8)	56.9 (71.6)		
	v/c	1.03 (0.95)	0.96 (0.53)	0.82 (0.96)	0.30 (0.34)	0.75 (0.91)	1.03 (0.76)	0.81 (0.94)	0.72 (0.68)	0.08 (0.16)	0.44 (0.82)	0.47 (0.74)		
Stallings Road/Potter Road (Signal)	LOS	C (C)	F (E)	A (B)	A (A)	E (E)	C (C)	A (B)	E (E)	E (D)	E (E)	E (D)	C (C)	
	Delay	30.3 (28.4)	82.7 (59.7)	5.9 (14.7)	2.3 (7.3)	75.9 (74.7)	21.7 (21.5)	6.9 (18.9)	60.0 (59.1)	58.3 (47.9)	57.3 (59.1)	57.8 (49.4)	30.2 (23.8)	
	v/c	0.81 (0.76)	0.81 (0.74)	0.51 (0.66)	0.23 (0.31)	0.49 (0.49)	0.80 (0.66)	0.05 (0.05)	0.70 (0.76)	0.78 (0.62)	0.24 (0.31)	0.65 (0.64)	0.37 (0.34)	
Pleasant Plains Rd (Signal)	LOS	B (B)	-	A (A)	D (E)	A (A)	D (D)	-	C (D)	-	-	-	-	
	Delay	12.4 (11.2)	-	7.0 (3.6)	44.6 (64.2)	5.8 (1.1)	54.4 (54.9)	-	34.1 (43.3)	-	-	-	-	
	v/c	0.71 (0.60)	-	0.46 (0.53)	0.71 (0.60)	0.37 (0.32)	0.22 (0.26)	-	0.38 (0.60)	-	-	-	-	
Proposed Chestnut Lane Connector/Chestnut Lane (Signal)	LOS	C (C)	F (E)	B (B)	E (D)	C (B)	A (A)	E (D)	E (E)	D (D)	E (E)	D (D)	C (B)	
	Delay	33.4 (27.9)	90.4 (65.8)	15.2 (18.8)	58.6 (38.0)	31.2 (13.0)	6.2 (5.6)	55.9 (51.5)	74.8 (69.0)	35.4 (37.8)	61.4 (56.5)	42.4 (39.6)	25.7 (16.6)	
	v/c	0.82 (0.79)	0.82 (0.74)	0.59 (0.79)	0.59 (0.64)	0.79 (0.70)	0.55 (0.42)	0.20 (0.12)	0.79 (0.68)	0.29 (0.31)	0.77 (0.79)	0.30 (0.35)	0.32 (0.30)	
Waxhaw-Indian Trail Road (Signal)	LOS	D (D)	E (D)	C (C)	B (A)	E (E)	D (D)	B (B)	E (F)	E (E)	C (C)	F (E)	E (E)	C (C)
	Delay	45.9 (41.2)	66.1 (45.9)	27.4 (31.2)	10.6 (5.9)	59.8 (72.9)	48.7 (36.1)	12.7 (11.8)	75.1 (81.1)	77.6 (60.7)	30.2 (23.6)	86.9 (65.8)	62.1 (77.6)	31.7 (26.7)
	v/c	0.97 (0.97)	0.63 (0.51)	0.79 (0.97)	0.10 (0.18)	0.52 (0.75)	0.97 (0.83)	0.14 (0.11)	0.76 (0.70)	0.95 (0.78)	0.34 (0.34)	0.75 (0.61)	0.78 (0.95)	0.19 (0.14)
U-turn west of Southfork Rd/Garmon Drive (Unsignalized)	LOS	D (E)¹	-	-	-	-	-	-	C (C)	-	-	D (E)	-	-
	Delay	27.3 (37.8)	-	-	-	-	-	-	20.6 (16.5)	-	-	27.3 (37.8)	-	-
	v/c	0.56 (0.62)	-	-	-	-	-	-	0.14 (0.11)	-	-	0.56 (0.62)	-	-
Southfork Road/Garmon Drive (Unsignalized)	LOS	F¹ (D)	-	-	-	-	-	-	-	-	C (C)	-	-	F (D)
	Delay	77.9 (32.0)	-	-	-	-	-	-	-	-	17.5 (22.0)	-	-	77.9 (32.0)
	v/c	0.90 (0.59)	-	-	-	-	-	-	-	-	0.08 (0.12)	-	-	0.90 (0.59)

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Table 1: Year 2040 Build Alternative 1 Capacity Analysis Results

Intersection	MOE	Overall	Eastbound			Westbound			Northbound			Southbound		
			L/U	T	R	L/U	T	R	L/U	T	R	L/U	T	R
U-turn west of Midway Drive/Brandon Oaks Parkway (Unsignalized)	LOS	C (C)	-	-	-	-	-	-	C (C)	-	-	C (C)	-	-
	Delay	22.4 (22.7)	-	-	-	-	-	-	22.4 (18.7)	-	-	18.8 (22.7)	-	-
	v/c	0.16 (0.18)	-	-	-	-	-	-	0.16 (0.17)	-	-	0.17 (0.18)	-	-
Midway Drive/Brandon Oaks Parkway (Signal)	LOS	C (B)	A (A)	B (B)	A (A)	B (A)	C (A)	D (D)	B (B)	B (B)				
	Delay	24.3 (11.8)	9.0 (6.0)	15.9 (12.4)	10.0 (8.7)	12.8 (8.5)	27.1 (7.9)	50.4 (36.1)	14.0 (17.6)	13.8 (17.7)				
	v/c	0.92 (0.77)	0.05 (0.03)	0.77 (0.77)	0.28 (0.43)	0.13 (0.20)	0.91 (0.65)	0.92 (0.72)	0.05 (0.04)	0.03 (0.06)				
WB U-turn east of Midway Drive (Unsignalized)	LOS	B (B)	-	-	-	-	-	-	-	-	-	B (B)	-	-
	Delay	10.6 (12.0)	-	-	-	-	-	-	-	-	-	10.6 (12.0)	-	-
	v/c	0.04 (0.17)	-	-	-	-	-	-	-	-	-	0.04 (0.17)	-	-
EB U-turn east of Midway Drive (Unsignalized)	LOS	C (B)	-	-	-	-	-	-	C (B)	-	-	-	-	-
	Delay	18.0 (14.8)	-	-	-	-	-	-	18.0 (14.8)	-	-	-	-	-
	v/c	0.13 (0.03)	-	-	-	-	-	-	0.13 (0.03)	-	-	-	-	-
Sun Valley Commons/Mustang Road (Signal)	LOS	C (C)	E (E)	C (C)	C (B)	E (D)	B (C)	A (C)	E (E)	B (C)	D (E)	C (C)		
	Delay	30.1 (32.3)	60.4 (58.4)	28.9 (25.9)	23.1 (19.2)	58.7 (53.2)	19.5 (27.8)	9.8 (22.5)	66.6 (71.5)	18.4 (22.1)	52.4 (61.1)	21.2 (22.0)		
	v/c	0.88 (0.85)	0.59 (0.59)	0.69 (0.77)	0.26 (0.31)	0.72 (0.74)	0.76 (0.58)	0.14 (0.14)	0.88 (0.85)	0.25 (0.27)	0.69 (0.72)	0.18 (0.15)		
Wesley Chapel-Stouts Road (Signal)	LOS	D (E)	E (F)	D (D)	D (C)	E (F)	E (D)	E (F)	D (C)	B (B)	D (D)	F (F)	C (B)	
	Delay	54.6 (55.3)	76.8 (114.0)	44.9 (48.8)	36.5 (23.0)	70.9 (109.2)	61.1 (54.4)	79.3 (80.3)	38.5 (29.7)	11.6 (12.7)	53.4 (54.2)	86.5 (80.0)	23.1 (18.4)	
	v/c	0.99 (1.03)	0.98 (1.03)	0.67 (0.87)	0.54 (0.76)	0.84 (1.00)	0.95 (0.88)	0.95 (0.93)	0.76 (0.54)	0.24 (0.25)	0.08 (0.12)	0.99 (1.01)	0.43 (0.40)	
Sun Valley High School (Signal)	LOS	B (B)	-	B (B)	A (A)	E (E)	A (A)	-	E (E)	-	C (D)	-	-	
	Delay	14.6 (17.8)	-	12.4 (17.8)	1.0 (0.5)	59.0 (62.0)	7.1 (5.9)	-	59.1 (60.8)	-	32.8 (37.9)	-	-	
	v/c	0.64 (0.77)	-	0.64 (0.77)	0.10 (0.07)	0.54 (0.45)	0.63 (0.52)	-	0.49 (0.58)	-	0.16 (0.28)	-	-	

Note: AM Peak Hour
(PM Peak Hour)

1. LOS E or F but considered acceptable because volume less than 100 vehicles per hour or queue less than 250'.

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Table 2: Year 2040 Build Alternative 1 Queue Analysis Results

Intersection	Movement	Number of Storage Bays	Synchro/HCS 95th Queue (ft) ¹		SimTraffic Max Queue (ft)		Proposed Storage Length (ft) ^{2,3}
			AM	PM	AM	PM	
Trade St (Signal)	Eastbound Left	1	#196	#193	208	600	500
	Westbound Left	1	m#296	#458	600	567	500
	Northbound Left	1	106	81	157	111	175
	Northbound Right	1	291	280	310	317	325
	Southbound Left	1	#565	#675	250	250	500
	Southbound Right	1	111	101	275	275	300
Charles Buckley Way (Signal)	Eastbound Left	1	m12	m9	115	126	150
	Southbound Left	1	92	84	132	126	150
Median Crossover location near Edgeland Dr	Eastbound U-turn	1	21	6	-	-	100
	Westbound U-turn	1	2	3	-	-	100
I-485 Inner Ramps (Signal)	Eastbound Right	1	0	0	0	0	Free Flow
	Westbound Right	1	0	0	0	0	Free Flow
	Southbound Left	1	#308	#319	391	402	425
	Southbound Right	1	112	89	280	223	300
I-485 Outer Ramps (Signal)	Eastbound Right	1	0	0	0	0	Free Flow
	Westbound Right	1	0	0	2	4	Free Flow
	Northbound Left	1	89	86	179	146	200
	Northbound Right	2	97	#134	162	185	200
Proposed McKee Rd Extension (Signal)	Eastbound Left	1	m#260	m90	327	154	350
	Eastbound Right	1	161	m131	183	265	275
	Westbound Left	1	m#168	m#223	410	342	425
	Southbound Left	1	25	42	40	70	100
	Southbound Right	1	123	#214	164	236	250
	Northbound Left	2	#207	#206	304	292	325
Potter Rd / Stallings Rd (Signal)	Eastbound Left	1	m161	m100	287	309	325
	Eastbound Right	1	m16	m81	131	216	225
	Westbound Left	1	108	109	125	127	150
	Westbound Right	1	13	24	70	73	100
	Northbound Left	2	161	#134	258	213	275
	Southbound Left	1	57	69	72	93	100
	Southbound Right	1	182	160	214	182	225
Pleasant Plains Rd (Signal)	Westbound Left	1	m226	m118	347	222	350
	Northbound Left	1	55	66	80	105	125

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Table 2: Year 2040 Build Alternative 1 Queue Analysis Results

Intersection	Movement	Number of Storage Bays	Synchro/HCS 95th Queue (ft) ¹		SimTraffic Max Queue (ft)		Proposed Storage Length (ft) ^{2,3}
			AM	PM	AM	PM	
Proposed Chestnut Ln Connector/ Chestnut Ln (Signal)	Eastbound Left	1	#280	222	332	291	350
	Westbound Left	1	m107	m121	154	174	200
	Westbound Right	1	m63	m127	294	190	300
	Northbound Left	1	49	38	75	57	100
	Northbound Right	1	131	138	161	155	175
	Southbound Left	2	#218	255	254	314	325
	Southbound Right	1	186	128	176	161	200
Waxhaw- Indian Trail Rd (Signal)	Eastbound Left	1	m#107	m91	166	141	175
	Eastbound Right	1	m47	m31	90	170	200
	Westbound Left	2	91	#129	141	135	150
	Westbound Right	1	72	58	144	82	150
	Northbound Left	1	#216	#151	457	178	475
	Northbound Right	1	171	108	441	153	450
	Southbound Left	1	#167	#188	185	356	375
U-turn west of Southfork Rd / Garmon Dr	Eastbound U-turn	1	12	9	-	-	100
	Westbound U-turn	1	81	94	-	-	100
U-turn west of Midway Dr/ Brandon Oaks Pkwy	Eastbound U-turn	1	14	15	-	-	100
	Westbound U-turn	1	15	16	-	-	100
Midway Dr / Brandon Oaks Pkwy (Signal)	Eastbound Left	1	6	4	34	23	100
	Eastbound Right	1	82	125	132	190	200
	Westbound Left	1	m8	m10	42	65	100
	Northbound Right	1	19	17	42	33	100
WB U-turn east of Midway Dr/Brandon Oaks Pkwy	Westbound U-turn	1	3	15	-	-	100
Median Crossover location near Radiator Rd	Eastbound U-turn	1	11	2	-	-	100
Sun Valley Commons/ Mustang Rd (Signal)	Eastbound Left	1	m87	m114	164	600	500
	Eastbound Right	1	m134	m183	144	600	500
	Westbound Left	1	m142	m190	247	260	275
	Westbound Right	1	m53	m69	78	133	150
	Northbound Right	1	123	132	190	172	200
	Southbound Right	1	95	75	145	122	175

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Table 2: Year 2040 Build Alternative 1 Queue Analysis Results

Intersection	Movement	Number of Storage Bays	Synchro/HCS 95th Queue (ft) ¹		SimTraffic Max Queue (ft)		Proposed Storage Length (ft) ^{2,3}
			AM	PM	AM	PM	
Wesley Chapel-Stouts Rd (Signal)	Eastbound Left	1	#451	m#435	522	600	500
	Eastbound Right	1	416	278	393	600	500
	Westbound Left	1	#318	#346	336	591	500
	Northbound Left	2	#310	#258	467	337	500
	Northbound Right	1	146	147	341	168	350
	Southbound Left	1	28	35	214	386	500
	Southbound Right	1	234	215	559	578	500
Sun Valley High School (Signal)	Westbound Left	1	140	102	189	148	200

1. The “#” indicates volume for the 95th percentile exceeds capacity. The “m” indicates the queue is metered by an upstream signal. If the reported v/c ratio is less than one, the queues are acceptable. (Synchro 9 User Guide, Trafficware).
2. The maximum proposed storage length is 500 feet and the minimum is 100 feet.
3. For free-flow right-turn movements, the design speed should be used to determine storage bay length to meet NCDOT standards.

A comparison of traffic operation analysis results for Alternative 1 between Year 2035 and Year 2040 is presented in Table 3.

Table 3: Alternative 1 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Build	
		2035	2040
Trade Street (Signal)	LOS	E (F)	E (E)
	Delay	61.2 (83.3)	69.4 (74.7)
	v/c	1.04 (1.22)	1.12 (1.16)
Charles Buckley Way (Signal) ¹	LOS	N/A	A (A)
	Delay		5.3 (9.1)
	v/c		0.78 (0.73)

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Table 3: Alternative 1 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Build	
		2035	2040
EB U-turn east of Charles Buckley Way	LOS	D (C)	B (B)
	Delay	26.0 (24.9)	10.4 (12.9)
	v/c	0.61 (0.61)	0.50 (0.60)
WB U-turn east of Charles Buckley Way ²	LOS	N/A	C (C)
	Delay		24.9 (18.0)
	v/c		0.60 (0.50)
I-485 Inner Ramps (Signal)	LOS	B (B)	C (C)
	Delay	15.7 (12.2)	17.2 (16.1)
	v/c	0.79 (0.69)	0.89 (0.93)
I-485 Outer Ramps (Signal)	LOS	B (B)	B (A)
	Delay	18.0 (18.6)	10.1 (8.3)
	v/c	0.78 (0.73)	0.75 (0.81)
Proposed McKee Road Extension (Signal)	LOS	B (B)	D (D)
	Delay	14.9 (16.3)	44.4 (41.1)
	v/c	0.81 (0.77)	1.03 (0.95)
Stallings Road/Potter Road (Signal)	LOS	D (D)	C (C)
	Delay	38.7 (38.8)	29.5 (28.2)
	v/c	0.80 (0.73)	0.81 (0.76)
Pleasant Plains Road/Kerry Greens Drive (Signal)	LOS	C (C)	B (B)
	Delay	23.8 (29.5)	11.9 (11.4)
	v/c	0.74 (0.76)	0.71 (0.60)

Addendum

Table 3: Alternative 1 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Build	
		2035	2040
Proposed Chestnut Lane Connector/ Chestnut Lane (Signal)	LOS	C (D)	B (C)
	Delay	34.9 (38.4)	11.9 (27.6)
	v/c	0.84 (0.81)	0.71 (0.79)
Waxhaw-Indian Trail Road (Signal)	LOS	D (D)	D (D)
	Delay	39.8 (50.6)	45.9 (41.2)
	v/c	0.89 (1.03)	0.97 (0.97)
U-turn west of Southfork Road/Garmon Drive	LOS	D (F) ³	D (E) ³
	Delay	34.9 (87.3)	27.3 (37.8)
	v/c	0.64 (0.90)	0.56 (0.62)
Southfork Rd/Garmon Drive	LOS	F ³ (F) ³	F ³ (D)
	Delay	93.3 (56.1)	77.9 (32.0)
	v/c	0.89 (0.93)	0.90 (0.77)
U-turn west of Midway Drive/Brandon Oaks Parkway	LOS	D (D)	C (C)
	Delay	28.3 (28.0)	22.4 (22.7)
	v/c	0.69 (0.69)	0.57 (0.57)
Midway Dr/Brandon Oaks Parkway (Signal)	LOS	C (C)	C (B)
	Delay	29.8 (22.8)	24.3 (11.8)
	v/c	1.07 (0.85)	0.92 (0.77)
WB U-turn east of Midway Drive	LOS	B (B)	B (B)
	Delay	10.6 (13.0)	10.6 (12.0)
	v/c	0.45 (0.53)	0.41 (0.48)

Addendum

Table 3: Alternative 1 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Build	
		2035	2040
EB U-turn East of Midway Drive. ²	LOS	NA	C (B)
	Delay		18.0 (14.8)
	v/c		0.48 (0.41)
Sun Valley Commons/ Mustang Road (Signal)	LOS	C (C)	C (C)
	Delay	32.3 (30.6)	30.1 (32.3)
	v/c	0.89 (0.81)	0.88 (0.85)
Wesley Chapel-Stouts Road (Signal)	LOS	D (D)	D (E)
	Delay	50.0 (46.3)	54.6 (55.3)
	v/c	0.93 (0.94)	0.99 (1.03)
Sun Valley High School (Signal)	LOS	B (B)	B (B)
	Delay	15.9 (19.6)	14.6 (17.8)
	v/c	0.61 (0.72)	0.64 (0.77)

Note: AM Peak Hour
(PM Peak Hour)

1. Intersection was not in 2035 scenario.
2. This intersection did not include U-turn in the 2035 scenarios.
3. LOS E or F but considered acceptable because volume less than 100 vehicles per hour or queue less than 250'.

As can be seen from Table 3, traffic operations at a majority of the study area intersections are expected to improve moderately under 2040 traffic conditions. This is due to the volume decrease highlighted in Figure 1.

Alternative 1 contains several median cross-over locations. It should be noted that the Synchro model shows the approximate location of these median cross-over intersections. The exact location of these median cross-over locations will be determined during the roadway design.

Synchro analysis results for Alternative 1 is presented in Attachment B.

Addendum

Alternative 2: Four-Lane Superstreet

Intersection Level of Service (LOS) at the study area roadway network during the AM and PM peak hours are presented in Figure 3. Figure 3 also shows the roadway geometry and the peak hour volumes used in the analysis. Detail analysis results for the study area intersections are presented in Table 4. Queue analysis results are presented in Table 5. Synchro and SimTraffic analysis results are presented in Attachment C.

Table 4: Year 2040 Build Alternative 2 Capacity Analysis Results

Intersection	MOE	Eastbound Old Monroe Road/ East John Street					Westbound Old Monroe Road/ East John Street						
		Overall	EB		WB		NB	Overall	EB		WB	SB	
			T	R	U	L	R		U	L	T	R	R
Trade St (Signal)		Traditional intersection – see Table 1 for analysis results											
Charles Buckley Way		Traditional intersection – see Table 1 for analysis results											
Median Crossover near Edgeland Dr	LOS	C (C)	-	-	C (C)	-	-	D (C)	D (C)	-	-	-	-
	Delay	17.3 (21.7)	-	-	17.3 (21.7)	-	-	25.7 (20.8)	25.7 (20.8)	-	-	-	-
	v/c	0.50 (0.60)	0.50 (0.60)	-	0.02 (0.07)	-	-	0.60 (0.50)	0.25 (0.24)	-	0.60 (0.50)	-	-
EB U-turn east of Clearbrook Rd	LOS	-	-	-	-	-	D (C)	D (C)	-	-	-	-	
	Delay	-	-	-	-	-	28.9 (19.5)	28.9 (19.5)	-	-	-	-	
	v/c	-	-	-	-	-	0.60 (0.50)	0.36 (0.17)	-	0.60 (0.50)	-	-	
EB U-turn west of I-485	LOS	-	-	-	-	-	D (C)	D (C)	-	-	-	-	
	Delay	-	-	-	-	-	27.5 (18.7)	27.5 (18.7)	-	-	-	-	
	v/c	-	-	-	-	-	0.60 (0.50)	0.31 (0.13)	-	0.60 (0.50)	-	-	
I-485 Inner Ramps		Traditional intersection – see Table 1 for analysis results											
I-485 Outer Ramps		Traditional intersection – see Table 1 for analysis results											
EB U-turn east of I-485	LOS	-	-	-	-	-	D (C)	D (C)	-	-	-	-	
	Delay	-	-	-	-	-	25.7 (19.8)	25.7 (19.8)	-	-	-	-	
	v/c	-	-	-	-	-	0.64 (0.53)	0.17 (0.13)	-	0.64 (0.53)	-	-	

Addendum

Table 4: Year 2040 Build Alternative 2 Capacity Analysis Results

Intersection	MOE	Eastbound Old Monroe Road/ East John Street						Westbound Old Monroe Road/ East John Street					
		Overall	EB		WB		NB	Overall	EB		WB		SB
			T	R	U	L	R		U	L	T	R	R
WB U-turn west of Proposed McKee Rd Extension (EB-Signal)	LOS	A (A)	A (A)	-	D (C)	-	-	-	-	-	-	-	-
	Delay	6.7 (11.8)	4.3 (10.0)	-	44.5 (30.2)	-	-	-	-	-	-	-	-
	v/c	0.64 (0.87)	0.64 (0.87)	-	0.46 (0.73)	-	-	-	-	-	-	-	-
Proposed McKee Rd Extension (WB-Signal, EB-Signal)	LOS	B (C)	B (C)	-	C (C)	D (E)	B (B)	-	D (C)	B (B)	D (D)	D (D)	
	Delay	22.0 (30.9)	14.2 (21.3)	-	25.9 (34.5)	41.2 (71.0)	17.3 (16.5)	-	45.4 (20.9)	12.8 (11.2)	46.2 (40.3)		
	v/c	0.86 (0.99)	0.86 (0.99)	-	0.28 (0.37)	0.85 (0.98)	0.87 (0.73)	-	0.69 (0.26)	0.87 (0.73)	0.62 (0.68)		
EB U-turn east of Proposed McKee Rd Extension(Signal)	LOS	-	-	-	-	-	B (B)	C (C)	-	B (A)	-	-	
	Delay	-	-	-	-	-	17.1 (13.7)	32.4 (30.7)	-	11.9 (8.7)	-	-	
	v/c	-	-	-	-	-	0.72 (0.57)	0.69 (0.56)	-	0.72 (0.57)	-	-	
WB U-turn west of Stallings Rd/ Potter Rd (EB-Signal)	LOS	A (B)	A (A)	-	C (D)	-	-	-	-	-	-	-	
	Delay	8.4 (10.2)	5.5 (5.4)	-	27.8 (40.9)	-	-	-	-	-	-	-	
	v/c	0.58 (0.74)	0.58 (0.74)	-	0.43 (0.59)	-	-	-	-	-	-	-	
Stallings Rd/Potter Rd (WB-Signal, EB-Signal)	LOS	B (B)	A (A)	B (B)	-	B (B)	C (D)	B (B)	-	D (C)	A (A)	A (A)	D (C)
	Delay	16.6 (15.7)	8.7 (9.2)	10.2 (10.5)	-	14.0 (19.1)	32.9 (36.1)	16.4 (15.6)	-	39.1 (23.0)	8.9 (7.2)	6.5 (6.1)	36.2 (34.7)
	v/c	0.73 (0.71)	0.45 (0.52)	0.47 (0.55)	-	0.12 (0.15)	0.73 (0.71)	0.67 (0.70)	-	0.51 (0.42)	0.61 (0.51)	0.29 (0.23)	0.67 (0.70)
U-turn east of Stallings Rd/Potter Rd (WB-Signal)	LOS	B (C)	-	-	B (C)	-	-	B (A)	B (B)	-	A (A)	-	-
	Delay	14.8 (16.8)	-	-	14.8 (16.8)	-	-	10.9 (9.6)	13.8 (15.6)	-	9.6 (7.1)	-	-
	v/c	0.29 (0.36)	0.29 (0.36)	-	0.27 (0.28)	-	-	0.67 (0.61)	0.67 (0.61)	-	0.53 (0.42)	-	-
Pleasant Plains Rd (EB-Signal)	LOS	B (B)	A (A)	A (A)	-	D (D)	C (D)	-	-	-	-	-	
	Delay	14.5 (13.4)	4.1 (3.5)	3.6 (2.4)	-	43.7 (42.4)	30.0 (37.3)	-	-	-	-	-	
	v/c	0.63 (0.57)	0.41 (0.47)	0.04 (0.03)	-	0.63 (0.49)	0.33 (0.57)	-	-	-	-	-	

Addendum



Table 4: Year 2040 Build Alternative 2 Capacity Analysis Results

Intersection	MOE	Eastbound Old Monroe Road/ East John Street						Westbound Old Monroe Road/ East John Street					
		Overall	EB		WB		NB	Overall	EB		WB		SB
			T	R	U	L	R		U	L	T	R	R
EB U-turn east of Pleasant Plains Dr	LOS	-	-	-	-	-	-	C (B)	C (B)	-	-	-	-
	Delay	-	-	-	-	-	-	15.5 (13.9)	15.5 (13.9)	-	-	-	-
	v/c	-	-	-	-	-	-	0.41 (0.34)	0.09 (0.09)	-	0.41 (0.34)	-	-
WB U-turn west of Morningside Meadow Ln	LOS	B (C)	-	-	B (C)	-	-	-	-	-	-	-	-
	Delay	13.7 (16.0)	-	-	13.7 (16.0)	-	-	-	-	-	-	-	-
	v/c	0.33 (0.42)	0.33 (0.42)	-	0.08 (0.11)	-	-	-	-	-	-	-	-
U-turn west of Proposed Chestnut Ln Connector/ Chestnut Ln (EB-Signal)	LOS	B (B)	B (B)	-	B (B)	-	-	C (B)	C (B)	-	-	-	-
	Delay	10.5 (13.2)	10.2 (10.8)	-	11.1 (18.2)	-	-	16.1 (13.5)	16.1 (13.5)	-	-	-	-
	v/c	0.65 (0.74)	0.49 (0.66)	-	0.65 (0.74)	-	-	0.41 (0.34)	0.13 (0.05)	-	0.41 (0.34)	-	-
Proposed Chestnut Ln Connector/ Chestnut Ln (WB-Signal, EB-Signal)	LOS	B (B)	A (B)		-	C (D)	D (D)	B (B)	-	C (B)	A (A)	A (B)	D (C)
	Delay	16.2 (17.9)	9.2 (11.9)		-	31.7 (39.6)	40.8 (48.0)	15.7 (17.8)	-	24.4 (14.7)	4.9 (8.5)	8.4 (11.3)	37.8 (31.6)
	v/c	0.76 (0.82)	0.68 (0.82)		-	0.23 (0.31)	0.76 (0.77)	0.78 (0.77)	-	0.47 (0.36)	0.53 (0.48)	0.71 (0.58)	0.78 (0.77)
U-turn west of Waxhaw-Indian Trail Rd (WB-Signal, EB-Signal)	LOS	A (B)	A (A)	-	C (D)	-	-	B (A)	E (C)	-	A (A)	-	-
	Delay	9.5 (11.5)	2.8 (4.1)	-	34.2 (36.7)	-	-	11.7 (12.0)	56.4 (34.1)	-	6.5 (3.8)	-	-
	v/c	0.58 (0.76)	0.58 (0.76)	-	0.58 (0.71)	-	-	0.71 (0.55)	0.65 (0.52)	-	0.71 (0.55)	-	-
Waxhaw Indian Trail Rd (WB-Signal, EB-Signal)	LOS	B (B)	B (B)	B (A)	-	A (B)	C (D)	B (B)	-	C (C)	A (A)	A (A)	D (C)
	Delay	18.4 (15.2)	13.2 (10.2)	10.7 (9.0)	-	6.6 (14.6)	33.5 (37.8)	12.3 (15.9)	-	24.7 (29.0)	6.4 (8.8)	5.3 (7.1)	38.8 (34.66)
	v/c	0.79 (0.74)	0.69 (0.74)	0.44 (0.56)	-	0.12 (0.22)	0.79 (0.74)	0.73 (0.75)	-	0.19 (0.17)	0.73 (0.63)	0.52 (0.41)	0.73 (0.75)
U-turn east of Waxhaw-Indian Trail Rd (WB-Signal)	LOS	C (C)	-	-	C (C)	-	-	C (B)	D (C)	-	C (A)	-	-
	Delay	15.8 (18.1)	-	-	15.8 (18.1)	-	-	25.4 (10.2)	41.4 (23.3)	-	20.4 (6.9)	-	-
	v/c	0.44 (0.53)	0.44 (0.53)	-	0.02 (0.01)	-	-	0.95 (0.75)	0.95 (0.75)	-	0.94 (0.69)	-	-

Addendum

Table 4: Year 2040 Build Alternative 2 Capacity Analysis Results

Intersection	MOE	Eastbound Old Monroe Road/ East John Street						Westbound Old Monroe Road/ East John Street					
		Overall	EB		WB		NB	Overall	EB		WB		SB
			T	R	U	L	R		U	L	T	R	R
WB U-turn west of Southfork Rd/Garmon Dr	LOS	D (E) ¹	-	-	D (E)	-	-	-	-	-	-	-	-
	Delay	28.4 (35.2)	-	-	28.4 (35.2)	-	-	-	-	-	-	-	-
	v/c	0.57 (0.60)	0.44 (0.53)	-	0.57 (0.60)	-	-	-	-	-	-	-	-
Southfork Rd/Garmon Dr (WB-Signal)	LOS	C (C)	-	-	-	-	C (C)	B (B)	-	-	B (A)	D (D)	
	Delay	17.5 (22.0)	-	-	-	-	17.5 (22.0)	17.0 (13.1)	-	-	13.5 (10.0)	49.4 (42.3)	
	v/c	0.64 (0.77)	0.64 (0.77)		-	-	0.08 (0.12)	0.82 (0.69)	-	-	0.82 (0.69)	0.73 (0.61)	
U-turn east of Southfork Rd/Garmon Dr	LOS	C (C)	-	-	C (C)	-	-	C (C)	C (C)	-	-	-	-
	Delay	16.6 (19.9)	-	-	16.6 (19.9)	-	-	23.1 (18.1)	23.1 (18.1)	-	-	-	-
	v/c	0.48 (0.57)	0.48 (0.57)	-	0.03 (0.03)	-	-	0.59 (0.46)	0.17 (0.16)	-	0.59 (0.46)	-	-
Median Crossover Location near Kennerly Dr	LOS	C (C)	-	-	C (C)	-	-	C (C)	C (C)	-	-	-	-
	Delay	16.7 (20.5)	-	-	16.7 (20.5)	-	-	21.3 (16.3)	21.3 (16.3)	-	-	-	-
	v/c	0.48 (0.57)	0.48 (0.57)	-	0.03 (0.07)	-	-	0.59 (0.46)	0.07 (0.02)	-	0.59 (0.46)	-	-
Midway Dr/Brandon Oaks Pkwy (EB-Signal)	LOS	B (B)	B (A)	A (A)	-	B (C)	D (D)	F (E) ¹	-	F (E)	-	-	C (C)
	Delay	15.9 (10.9)	10.7 (7.6)	7.7 (5.8)	-	15.6 (28.3)	36.2 (39.2)	75.4 (40.0)	-	75.4 (40.0)	-	-	21.0 (16.6)
	v/c	0.67 (0.63)	0.59 (0.63)	0.22 (0.36)	-	0.04 (0.08)	0.67 (0.54)	0.78 (0.62)	-	0.11 (0.04)	0.78 (0.62)	0.06 (0.07)	
U-turn east of Midway Dr/Brandon Oaks Pkwy (WB-Signal)	LOS	C (C)	-	-	C (C)	-	-	A (A)	A (B)	-	A (A)	-	-
	Delay	15.2 (18.2)	-	-	15.2 (18.2)	-	-	5.2 (5.3)	9.0 (18.8)	-	4.3 (3.0)	-	-
	v/c	0.41 (0.48)	0.41 (0.48)	-	0.06 (0.14)	-	-	0.69 (0.51)	0.63 (0.45)	-	0.69 (0.51)	-	-
U-turn west of Sun Valley Commons/ Mustang Rd (EB-Signal)	LOS	A (A)	A (A)	-	C (C)	-	-	C (B)	C (B)	-	-	-	-
	Delay	5.1 (6.2)	1.9 (3.6)	-	32.5 (34.2)	-	-	17.4 (14.5)	17.4 (14.5)	-	-	-	-
	v/c	0.55 (0.63)	0.55 (0.63)	-	0.53 (0.54)	-	-	0.49 (0.39)	0.04 (0.03)	-	0.49 (0.39)	-	-

Addendum

Table 4: Year 2040 Build Alternative 2 Capacity Analysis Results

Intersection	MOE	Eastbound Old Monroe Road/ East John Street						Westbound Old Monroe Road/ East John Street					
		Overall	EB		WB		NB	Overall	EB		WB		SB
			T	R	U	L	R		U	L	T	R	R
Sun Valley Commons/ Mustang Rd (WB-Signal, EB-Signal)	LOS	B (B)	A (A)	A (A)	-	B (C)	D (D)	B (B)	-	C (C)	A (A)	-	D (D)
	Delay	14.0 (12.8)	6.5 (5.8)	3.9 (5.0)	-	18.4 (25.4)	35.4 (36.9)	12.5 (11.0)	-	24.9 (30.7)	7.4 (4.6)	-	39.3 (37.9)
	v/c	0.68 (0.66)	0.52 (0.61)	0.22 (0.27)	-	0.39 (0.47)	0.68 (0.66)	0.69 (0.56)	-	0.29 (0.40)	0.69 (0.56)	-	0.59 (0.52)
U-turn west of Wesley Chapel-Stouts Rd (WB-Signal, EB-Signal)	LOS	A (B)	A (A)	-	C (D)	-	-	A (A)	B (B)	-	A (A)	-	-
	Delay	8.8 (10.2)	4.2 (5.9)	-	33.6 (37.6)	-	-	4.3 (3.8)	12.7 (12.6)	-	2.8 (2.4)	-	-
	v/c	0.65 (0.68)	0.58 (0.68)	-	0.65 (0.67)	-	-	0.63 (0.52)	0.51 (0.45)	-	0.63 (0.52)	-	-
Wesley Chapel-Stouts Rd (Signal) ²	LOS	C (B)	The reported MOE is for the overall intersection.										
	Delay	21.0 (19.7)											
	v/c	0.87 (0.80)											
EB U-turn/ Sun Valley High School (WB-Signal, EB-Signal)	LOS	B (B)	A (A)	A (A)	-	C (C)	D (D)	B (B)	C (C)	-	B (B)	-	-
	Delay	13.0 (16.7)	5.7 (9.5)	2.5 (2.8)	-	33.8 (30.1)	40.4 (46.7)	18.3 (16.5)	22.5 (22.5)	-	15.0 (11.6)	-	-
	v/c	0.58 (0.75)	0.58 (0.75)	0.11 (0.09)	-	0.34 (0.19)	0.56 (0.72)	0.74 (0.71)	0.74 (0.71)	-	0.54 (0.43)	-	-
U-turn east of Sun Valley High School	LOS	-	-	-	-	-	-	D (C)	D (C)	-	-	-	-
	Delay	-	-	-	-	-	-	27.5 (21.2)	27.5 (21.2)	-	-	-	-
	v/c	-	-	-	-	-	-	0.62 (0.48)	0.37 (0.36)	-	0.62 (0.48)	-	-

Note: AM Peak Hour
(PM Peak Hour)

1. LOS E or F but considered acceptable because volume less than 100 vehicles per hour or queue less than 250'.
2. Michigan Left intersection – See attachment C for the analysis report.

Addendum

Table 5: Year 2040 Build Alternative 2 Queue Analysis Results

Intersection	Movement	Number of Storage Bays	Synchro/HCS 95th Queue (ft) ¹		SimTraffic Max Queue (ft)		Proposed Storage Length (ft) ^{2,3}
			AM	PM	AM	PM	
Trade St (Signal)	Eastbound Left	1	#196	#193	228	600	500
	Westbound Left	1	m#297	#444	600	574	500
	Northbound Left	1	106	81	159	106	175
	Northbound Right	1	291	277	366	325	375
	Southbound Left	1	#565	#675	250	250	500
	Southbound Right	1	111	101	275	275	300
Charles Buckley way (Signal)	Eastbound Left	1	m10	m9	117	99	125
	Southbound Left	1	92	84	128	120	150
Median Crossover near Edgeland Dr.	Eastbound U-turn	1	24	23	-	-	100
	Westbound U-turn	1	2	6	-	-	100
U-turn east of Clearbrook Rd	Eastbound U-turn	1	38	15	-	-	100
U-turn west of I-485	Eastbound Left	1	0	0	0	0	Free Flow
I-485 Inner Ramps (Signal)	Eastbound Right	1	0	0	0	0	Free Flow
	Westbound Right	1	#384	#401	400	428	450
	Southbound Left	1	153	121	221	197	250
	Southbound Right	1	0	0	0	0	Free Flow
I-485 Outer Ramps (Signal)	Eastbound Right	1	0	0	8	4	Free Flow
	Westbound Right	1	122	119	202	203	225
	Northbound Left	2	133	168	190	222	250
	Northbound Right	1	15	11	-	-	100
EB U-turn east of I-485	Eastbound U-turn	1	m44	m#92	111	174	200
WB U-turn west of Proposed McKee Rd Extension (EB-Signal)	Westbound U-turn	1	m#146	m45	110	273	300
Proposed McKee Rd Extension (Signal)	Eastbound Left	1	112	122	123	114	150
	Westbound Left	1	#300	#293	368	327	375
	Northbound Right	1	104	163	189	274	300
	Southbound Right	2	175	126	140	134	200
EB U-turn east of Proposed McKee Rd Extension (Signal)	Eastbound U-turn	2	79	136	133	140	150

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Table 5: Year 2040 Build Alternative 2 Queue Analysis Results

Intersection	Movement	Number of Storage Bays	Synchro/HCS 95th Queue (ft) ¹		SimTraffic Max Queue (ft)		Proposed Storage Length (ft) ^{2,3}
			AM	PM	AM	PM	
WB U-turn west of Potter Rd/ Stallings Rd (EB-Signal)	Westbound U-turn	1	186	m138	161	148	200
Potter Rd / Stallings Rd (WB-Signal, EB-Signal)	Eastbound Left	1	206	199	142	152	225
	Eastbound Right	1	m44	60	86	80	100
	Westbound Left	1	98	64	184	146	200
	Westbound Right	1	217	193	248	248	275
	Northbound Right	1	169	192	274	307	325
	Southbound Right	2	47	38	137	132	Full
U-turn east of Stallings Rd/Potter Rd (WB-Signal)	Eastbound U-turn	1	27	28	-	-	100
	Westbound U-turn	1	m176	m142	157	138	200
Pleasant Plains Rd (Signal)	Westbound Left	1	81	125	174	208	225
	Northbound Right	1	7	8	-	-	100
U-turn east of Pleasant Plains Rd	Eastbound U-turn	1	7	9	-	-	100
U-turn west of Morningside Meadow Ln	Westbound U-turn	1	11	4	-	-	100
U-turn west of Chestnut Ln (EB-Signal)	Eastbound U-turn	2	17	37	171	256	Full
	Westbound U-turn	1	163	m118	198	171	225
Proposed Chestnut Ln Connector/ Chestnut Ln (WB-Signal, EB-Signal)	Eastbound Left	1	m99	125	137	153	175
	Westbound Left	1	80	211	160	155	225
	Westbound Right	2	220	245	211	267	275
	Southbound Right	1	m190	m118	141	120	200
U-turn west of Waxhaw-Indian Trail Rd (WB- Signal, EB-Signal)	Eastbound U-turn	2	m137	195	122	140	225
	Westbound U-turn	1	m50	m46	106	122	150
Waxhaw-Indian Trail Rd (WB-Signal, EB-Signal)	Eastbound Left	1	173	179	184	190	200
	Eastbound Right	2	m15	m40	58	95	125
	Westbound Left	1	m88	86	186	173	200
	Westbound Right	1	278	210	494	373	500
	Northbound Right	1	196	228	280	351	375
	Southbound Right	1	#507	m221	405	185	500

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Table 5: Year 2040 Build Alternative 2 Queue Analysis Results

Intersection	Movement	Number of Storage Bays	Synchro/HCS 95th Queue (ft) ¹		SimTraffic Max Queue (ft)		Proposed Storage Length (ft) ^{2,3}
			AM	PM	AM	PM	
U-turn east of Waxhaw-Indian Trail Rd (WB-Signal)	Eastbound U-turn	1	2	1	-	-	100
	Westbound U-turn	1	84	89	-	-	100
WB U-turn west of Southfork Rd / Garmon Dr	Westbound U-turn	1	15	14	-	-	100
U-turn east of Southfork Rd/Garmon Dr	Eastbound U-turn	1	2	2	-	-	100
	Westbound U-turn	1	6	1	-	-	100
Median Crossover location near Kennerly Dr	Eastbound U-turn	1	2	5	-	-	100
	Westbound U-turn	1	8	3	-	-	100
Midway Dr / Brandon Oaks Pkwy (EB-Signal)	Eastbound Left	1	92	113	115	148	175
	Eastbound Right	1	m9	m23	30	47	100
	Westbound Left	1	171	113	355	239	375
	Northbound Right	2	19	17	136	123	150
U-turn east of Midway Dr / Brandon Oaks Pkwy (WB-Signal)	Eastbound U-turn	1	5	12	-	-	100
	Westbound U-turn	1	3	3	-	-	100
U-turn west of Sun Valley Commons/ Mustang Rd (EB-Signal)	Eastbound U-turn	1	m144	142	127	125	150
	Westbound U-turn	1	m61	m71	97	107	125
Sun Valley Commons/ Mustang Rd (WB-Signal, EB-Signal)	Eastbound Left	1	44	62	134	138	150
	Eastbound Right	1	158	181	169	180	200
	Westbound Left	1	181	162	310	275	325
	Northbound Right	1	129	107	247	190	275
	Southbound Right	2	95	19	131	178	200
U-turn west of Wesley Chapel-Stouts Rd (WB-Signal, EB-Signal)	Eastbound U-turn	1	m149	m172	144	150	200
	Westbound U-turn	1	252	219	262	248	275
Wesley Chapel-Stouts Rd (WB-Signal, EB-Signal)	Westbound Right	2	268	208	311	264	325
	Northbound Right	1	225	224	230	246	275
	Southbound Right	2	93	190	199	179	Full

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Table 5: Year 2040 Build Alternative 2 Queue Analysis Results

Intersection	Movement	Number of Storage Bays	Synchro/HCS 95th Queue (ft) ¹		SimTraffic Max Queue (ft)		Proposed Storage Length (ft) ^{2,3}
			AM	PM	AM	PM	
EB U-turn west of Sun Valley High School (WB-Signal)	Eastbound U-turn	1	41	63	142	161	175
Sun Valley High School (EB-Signal)	Westbound Left	1	41	40	-	-	150
U-turn east of Sun Valley High School	Eastbound U-turn	1	0	0	0	0	Free Flow

1. The “#” indicates volume for the 95th percentile exceeds capacity. The “m” symbol indicates the queue is metered by an upstream signal. If the reported v/c ratio is less than one, the queues are acceptable. (Synchro 9 User Guide, Trafficware).
2. The maximum proposed storage length is 500 feet and the minimum is 100 feet.
3. For free-flow right-turn movements, the design speed should be used to determine storage bay length to meet NCDOT standards.

A comparison of traffic operation analysis results for Alternative 2 between Year 2035 and Year 2040 is presented in Table 6.

Table 6: Alternative 2 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Eastbound Old Monroe Road/ East John Street		Westbound Old Monroe Road/ East John Street	
		2035 Build	2040 Build	2035 Build	2040 Build
Trade St (Signal)	Traditional intersection – see Table 3 for analysis results				
Charles Buckley Way (Signal)	Traditional intersection – see Table 3 for analysis results				
U-turn east of Charles Buckley Way	LOS	E ¹ (F) ¹	C (C)	D (C)	D (C)
	Delay	44.9 (101.2)	17.3 (21.7)	26.5 (20.4)	25.7 (20.8)
	v/c	0.65 (0.81)	0.50 (0.60)	0.61 (0.49)	0.60 (0.50)
EB U-turn east of Clearbrook Rd	LOS	NA	NA	D (C)	D (C)
	Delay			33.3 (21.0)	28.9 (19.5)
	v/c			0.65 (0.53)	0.60 (0.50)

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Table 6: Alternative 2 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Eastbound Old Monroe Road/ East John Street		Westbound Old Monroe Road/ East John Street	
		2035 Build	2040 Build	2035 Build	2040 Build
EB U-turn west of I-485 Inner ramps	LOS	NA	NA	D (C)	D (C)
	Delay			33.8 (21.2)	27.5 (19.8)
	v/c			0.67 (0.56)	0.60 (0.53)
I-485 Inner Ramps	Traditional intersection – see Table 3 for analysis results				
I-485 Outer Ramps	Traditional intersection – see Table 3 for analysis results				
EB U-turn east of I-485	LOS	NA	NA	C (C)	D (C)
	Delay			20.5 (16.5)	25.7 (19.8)
	v/c			0.54 (0.44)	0.64 (0.53)
WB U-turn west of Proposed McKee Rd Extension (EB-Signal)	LOS	B (A)	A (A)	NA	NA
	Delay	10.6 (9.9)	6.7 (5.3)		
	v/c	0.61 (0.72)	0.64 (0.87)		
Proposed McKee Rd Extension (WB-Signal)	LOS	NA	C (B)	C (B)	B (A)
	Delay		22.0 (19.4)	20.6 (17.4)	17.3 (2.8)
	v/c		0.86 (0.99)	0.84 (0.69)	0.87 (0.73)
EB U-turn east of Proposed McKee Rd Extension	LOS	NA	NA	C (C)	B (A)
	Delay			19.6 (16.1)	17.1 (1.7)
	v/c			0.50 (0.44)	0.72 (0.63)

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Table 6: Alternative 2 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Eastbound Old Monroe Road/ East John Street		Westbound Old Monroe Road/ East John Street	
		2035 Build	2040 Build	2035 Build	2040 Build
WB U-turn west of Stallings Rd/ Potter Rd (EB-Signal)	LOS	B (B)	A (A)	NA	NA
	Delay	10.1 (12.8)	8.4 (2.3)		
	v/c	0.50 (0.63)	0.58 (0.74)		
Stallings Rd/Potter Rd (WB-Signal, EB-Signal)	LOS	B (C)	B (A)	B (B)	B (A)
	Delay	19.9 (21.7)	16.6 (2.3)	13.5 (13.9)	16.4 (2.2)
	v/c	0.87 (0.85)	0.73 (0.71)	0.61 (0.70)	0.67 (0.70)
U-turn east of Stallings Rd/Potter Rd (WB-Signal)	LOS	B (B)	B (C)	B (A)	B (A)
	Delay	13.3 (14.3)	14.8 (16.8)	11.9 (7.2)	10.9 (1.6)
	v/c	0.24 (0.29)	0.29 (0.36)	0.74 (0.66)	0.67 (0.61)
Pleasant Plains Rd ² (EB-Signal)	LOS	B (B)	B (A)	C (D)	NA
	Delay	15.9 (13.9)	14.5 (1.8)	21.2 (25.3)	
	v/c	0.63 (0.64)	0.63 (0.57)	0.37 (0.34)	
EB U-turn/ Sweetbriar Dr ² (WB-Signal)	LOS	C (C)	NA	A (B)	C (B)
	Delay	18.6 (22.4)		9.1 (11.8)	15.5 (13.9)
	v/c	0.36 (0.42)		0.53 (0.61)	0.41 (0.34)
WB U-turn west of Morningside Meadow Ln	LOS	B (B)	B (C)	NA	NA
	Delay	12.3 (13.5)	13.7 (16.0)		
	v/c	0.27 (0.32)	0.33 (0.42)		

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Table 6: Alternative 2 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Eastbound Old Monroe Road/ East John Street		Westbound Old Monroe Road/ East John Street	
		2035 Build	2040 Build	2035 Build	2040 Build
U-turn west of Proposed Chestnut Ln Connector/ Chestnut Ln (EB-Signal)	LOS	A (B)	B (A)	B (B)	C (B)
	Delay	9.4 (12.4)	10.5 (2.8)	13.7 (11.9)	16.1 (13.5)
	v/c	0.70 (0.75)	0.65 (0.74)	0.33 (0.26)	0.41 (0.34)
Proposed Chestnut Ln Connector/ Chestnut Ln (WB-Signal, EB-Signal)	LOS	B (B)	B (A)	C (C)	B (A)
	Delay	16.2 (19.2)	16.1 (4.7)	20.7 (21.6)	15.6 (2.7)
	v/c	0.77 (0.82)	0.76 (0.82)	0.85 (0.84)	0.78 (0.77)
U-turn west of Waxhaw-Indian Trail Rd (WB-Signal, EB-Signal)	LOS	A (A)	A (A)	B (A)	A (A)
	Delay	5.6 (8.8)	6.8 (3.1)	10.3 (6.8)	9.2 (1.4)
	v/c	0.55 (0.69)	0.58 (0.76)	0.70 (0.61)	0.71 (0.55)
Waxhaw Indian Trail Rd(WB-Signal, EB-Signal)	LOS	B (C)	B (A)	B (B)	B (A)
	Delay	19.0 (21.8)	18.3 (3.0)	10.7 (13.3)	12.3 (2.6)
	v/c	0.82 (0.86)	0.79 (0.74)	0.66 (0.71)	0.73 (0.75)
U-turn east of Waxhaw-Indian Trail Rd (WB-Signal)	LOS	C (C)	C (C)	B (B)	C (A)
	Delay	18.9 (22.5)	15.8 (18.1)	12.7 (10.5)	25.4 (3.6)
	v/c	0.54 (0.64)	0.44 (0.53)	0.92 (0.77)	0.95 (0.75)
WB U-turn west of Southfork Rd/Garmon Dr	LOS	D (F) ¹	D (E) ¹	NA	NA
	Delay	33.8 (83.8)	28.4 (35.2)		
	v/c	0.56 (0.89)	0.57 (0.60)		

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Table 6: Alternative 2 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Eastbound Old Monroe Road/ East John Street		Westbound Old Monroe Road/ East John Street	
		2035 Build	2040 Build	2035 Build	2040 Build
Southfork Rd/Garmon Dr (WB-Signal)	LOS	C (D)	C (C)	B (B)	B (A)
	Delay	20.4 (27.8)	17.5 (22.0)	18.5 (13.9)	17.0 (2.4)
	v/c	0.76 (0.93)	0.64 (0.77)	0.91 (0.79)	0.82 (0.69)
U-turn east of Southfork Rd/Garmon Dr	LOS	C (D)	C (C)	D (C)	C (C)
	Delay	19.2 (25.2)	16.6 (20.5)	28.4 (21.0)	23.1 (18.1)
	v/c	0.55 (0.69)	0.48 (0.57)	0.69 (0.56)	0.59 (0.46)
U-turn west of Midway Dr/Brandon Oaks Pkwy/ Kennerly Dr ²	LOS	E ¹ (F) ¹	C (C)	D (C)	C (C)
	Delay	35.4 (103.4)	16.7 (20.9)	26.4 (18.8)	21.3 (16.3)
	v/c	0.71 (0.90)	0.48 (0.58)	0.69 (0.54)	0.59 (0.46)
Midway Dr/Brandon Oaks Pkwy (EB-Signal)	LOS	B (B)	B (A)	F ¹ (F) ¹	F ¹ (E) ¹
	Delay	16.7 (14.4)	15.9 (1.5)	232.8 (75.0)	75.4 (40.0)
	v/c	0.70 (0.76)	0.67 (0.63)	0.91 (0.73)	0.78 (0.62)
U-turn east of Midway Dr/Brandon Oaks Pkwy (WB-Signal)	LOS	C (C)	C (C)	A (A)	A (A)
	Delay	16.5 (20.9)	15.2 (18.2)	7.3 (9.9)	5.2 (1.0)
	v/c	0.45 (0.54)	0.41 (0.48)	0.77 (0.62)	0.69 (0.51)
U-turn west of Sun Valley Commons/ Mustang Rd (EB-Signal)	LOS	A (A)	A (A)	C (C)	C (B)
	Delay	2.2 (5.8)	5.1 (1.7)	18.4 (15.8)	17.4 (14.5)
	v/c	0.52 (0.69)	0.55 (0.63)	0.52 (0.44)	0.49 (0.39)

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Table 6: Alternative 2 Traffic Operation Analysis Comparison-Year 2035 vs Year 2040

Intersection	MOE	Eastbound Old Monroe Road/ East John Street		Westbound Old Monroe Road/ East John Street	
		2035 Build	2040 Build	2035 Build	2040 Build
Sun Valley Commons/ Mustang Rd (WB-Signal, EB-Signal)	LOS	B (B)	B (A)	B (B)	B (A)
	Delay	12.6 (12.3)	14.0 (2.1)	14.2 (12.9)	12.5 (1.6)
	v/c	0.67 (0.62)	0.68 (0.66)	0.70 (0.60)	0.69 (0.56)
U-turn west of Wesley Chapel-Stouts Rd (WB-Signal, EB-Signal)	LOS	A (A)	A (A)	A (A)	A (A)
	Delay	7.0 (9.0)	8.8 (2.6)	4.4 (5.4)	4.3 (1.1)
	v/c	0.57 (0.64)	0.65 (0.68)	0.61 (0.50)	0.63 (0.52)
Wesley Chapel-Stouts Rd (Signal)	LOS	B (B)	B (B)	B (B)	C (B)
	Delay	17.6 (13.9)	17.5 (12.9)	17.2 (16.7)	21.0 (19.7)
	v/c	0.81 (0.76)	0.87 (0.80)	0.81 (0.76)	0.87 (0.80)
EB U-turn/ Sun Valley High School (WB-Signal, EB-Signal)	LOS	B (B)	B (A)	B (B)	B (A)
	Delay	13.2 (20.0)	13.0 (5.2)	14.6 (14.0)	18.3 (2.3)
	v/c	0.61 (0.83)	0.58 (0.75)	0.73 (0.70)	0.74 (0.71)
U-turn east of Sun Valley High School (WB-Signal)	LOS	NA	NA	B (B)	D (C)
	Delay			12.4 (10.8)	27.5 (21.2)
	v/c			0.71 (0.58)	0.62 (0.48)

Note: AM Peak Hour
(PM Peak Hour)

1. LOS E or F but considered acceptable because volume less than 100 vehicles per hour or queue less than 250'.

As can be seen from Table 6, in year 2040, most of the study area intersections, including proposed U-turn locations, are expected to operate at LOS that is comparable to year 2035 analysis results. Two intersections, westbound U-turn west of Southfork Road/Garmon Drive and

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U-turn west of Midway Drive/Brandon Oaks Parkway/Kennerly Drive is expected to see noticeable improvements in 2040 due to decrease in forecasted volumes.

Comparison of Network Level MOE

A comparison of network level MOE is presented in Table 7. As can be seen from Table 7, both the alternatives would operate at a comparable level during year 2040.

Table 7: Future Year Delay Analysis-Alternative 1 VS Alternative 2

Future Year (4-Lane) Delay Analysis (Superstreet vs. Median)						
Congestion Management Section (U-4714) - March 30, 2018						
MOE	AM			PM		
	Superstreet	Median	% Change	Superstreet	Median	% Change
Vehicles Exited (veh / hr)	12,482	12,054	-3.43%	12,622	12,092	-4.20%
Vehicles Entered (veh / hr)	12,690	12,372	-2.51%	12,707	12,479	-1.79%
Travel Distance (mi)	26,212	24,946	-4.83%	25,840	25,312	-2.04%
Travel Time (hr)	1,210	1,303	7.69%	1,211	1,353	11.73%
Total Delay (hr)	487	586	20.31%	503	634	26.07%
Total Stops	34,305	29,473	-14.09%	32,215	30,564	-5.12%
Fuel Useage (gal)	985	974	-1.14%	972	1,000	2.97%
Per Veh. Distance (mi)	2.10	2.07	-1.45%	2.05	2.09	2.25%
Per Veh. Time (hr)	0.10	0.11	11.52%	0.10	0.11	16.62%
Per Veh. Delay (hr)	0.04	0.05	24.58%	0.04	0.05	31.59%
Per Veh. Stops	2.75	2.45	-11.03%	2.55	2.53	-0.97%
Per Veh. Fuel (gal)	0.08	0.08	2.37%	0.08	0.08	7.49%
Synchro Old Monroe Eastbound Arterial Speed (mph)	25.8	27.9	8.14%	23.9	24.5	2.51%
Synchro Old Monroe Westbound Arterial Speed (mph)	27.4	24.6	-10.22%	29.6	27.7	-6.42%

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Conclusion

From a traffic operation standpoint, both the alternatives are expected to operate at comparable levels for the forecasted 2040 Traffic Volume. Most of the intersections are expected to operate at overall LOS D or better during the peak hours. The remaining unsignalized intersections that would operate at LOS E or F are not considered unacceptable because they are yield- or stop-controlled with critical movement volume less than 100 vehicles per hour or a queue length of less than 250 feet. The yield- or stop-controlled movements would experience substantial delay due to high opposing volumes, but the movement volume itself is not high enough to warrant further improvements (e.g. a signal).

However, the side streets and individual movements are expected to operate better under the superstreet alternative, especially at the five intersections that were identified as intersections of local significance during the project coordination meeting with NCDOT personnel.

Table 8 lists the five intersections of local significance and provides a comparison between the Median Divided and Superstreet alternatives.

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Table 8: Comparison of Alternative 1 to Alternative 2

Inter-section	Median Alternative	Superstreet Alternative
McKee Road	<p><u>Extent of Geometric Improvements</u></p> <ul style="list-style-type: none"> The extent of geometric improvements at this location will be higher on the Median Divided Alternative. The Median Divided Alternative will need the following improvements to operate at overall LOS D or better that will not be required in the Superstreet Alternative: <ul style="list-style-type: none"> A right turn lane on the eastbound Old Monroe Road. Both the northbound and southbound approaches will need to have three lanes in the Median Divided Alternative. In the Superstreet Alternative, these approaches will have two lanes. <p><u>Overall Intersection LOS</u></p> <ul style="list-style-type: none"> The overall intersection would operate at LOS D during both the AM and PM peak hours. <p><u>Individual Movement LOS</u></p> <ul style="list-style-type: none"> Six of the ten movements at this intersection is expected to operate at LOS E or worse during either of the peak hours. These include: <ul style="list-style-type: none"> Eastbound, Westbound and Northbound left turn movements. All movements on the southbound approach. While the westbound through movement is expected to operate at LOS D during the AM peak hour, it will be over capacity. This will result in queuing issues along the westbound Old Monroe Road approach at this intersection. 	<p><u>Extent of Geometric Improvements</u></p> <ul style="list-style-type: none"> The extent of geometric Improvements will be lower in the Superstreet Alternative. <p><u>Overall Intersection LOS</u></p> <ul style="list-style-type: none"> The intersection would operate at LOS C or better during the peak hours. <p><u>Individual Movement LOS</u></p> <ul style="list-style-type: none"> None of the movement is expected to operate at LOS E or worse during either of the peak hour. Additionally, all movements are expected to operate under capacity at this intersection.

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Table 8: Comparison of Alternative 1 to Alternative 2

Inter-section	Median Alternative	Superstreet Alternative
Stallings Road/ Potter Road	<p><u>Extent of Geometric Improvements</u></p> <ul style="list-style-type: none"> Both the northbound approach of Potter Road and southbound approach of Stallings Road will require three lanes at the intersection. <p><u>Overall Intersection LOS</u></p> <ul style="list-style-type: none"> The overall intersection would operate at LOS C or better during both the AM and PM peak hours. <p><u>Individual Movement LOS</u></p> <ul style="list-style-type: none"> Six of the 10 movements at this intersection is expected to operate at LOS E or worse during either of the peak hours. These includes: <ul style="list-style-type: none"> Left turn movements at all four approaches. Through movement on both the southbound and northbound approaches. 	<p><u>Extent of Geometric Improvements</u></p> <ul style="list-style-type: none"> Both the northbound approach of Stallings Road and southbound approach of Potter Road will require two lanes at the intersection. <p><u>Overall Intersection LOS</u></p> <ul style="list-style-type: none"> The overall intersection would operate at LOS C or better during both the AM and PM peak hours. <p><u>Individual Movement LOS</u></p> <ul style="list-style-type: none"> None of the movement is expected to operate at LOS E or worse during either of the peak hour. Additionally, all movements are expected to operate under capacity at this intersection.

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Table 8: Comparison of Alternative 1 to Alternative 2

Inter-section	Median Alternative	Superstreet Alternative
Indian Trail Road	<p><u>Extent of Geometric Improvements</u></p> <ul style="list-style-type: none"> The extent of geometric improvements at this location will be higher on the Median Divided Alternative: <ul style="list-style-type: none"> Both the northbound approach of Waxhaw Indian Trail Road and southbound approach of Indian Trail Road will require 3 lanes at the intersection. This will require widening of the existing road and may require additional right-of-way. <p><u>Overall Intersection LOS</u></p> <ul style="list-style-type: none"> The overall intersection would operate at LOS D during both the AM and PM peak hours. <p><u>Individual Movement LOS</u></p> <ul style="list-style-type: none"> Six of the 10 movements at this intersection is expected to operate at LOS E or worse during either of the peak hours. These includes: <ul style="list-style-type: none"> Left turn movements at all four approaches. Through movement on both the southbound and northbound approaches. 	<p><u>Extent of Geometric Improvements</u></p> <ul style="list-style-type: none"> The extent of geometric Improvements will be lower in the Superstreet Alternative. Both the northbound and southbound approach will require only 2 lanes at the intersection and thereby minimize potential right-of-way impacts in adjacent property. <p><u>Overall Intersection LOS</u></p> <ul style="list-style-type: none"> The intersection would operate at LOS B during both the peak hours. <p><u>Individual Movement LOS</u></p> <ul style="list-style-type: none"> None of the movement is expected to operate at LOS E or worse during either of the peak hour.
Brandon Oaks Parkway /Midway Drive	The extent of geometric improvements and the traffic operation at this intersection would be comparable under both alternatives	

Addendum

Table 8: Comparison of Alternative 1 to Alternative 2

Inter-section	Median Alternative	Superstreet Alternative
Wesley Chapel Stouts Road	<p><u>Extent of Geometric Improvements</u></p> <ul style="list-style-type: none"> • The extent of geometric improvements at this location will be higher on the Median Divided Alternative: <ul style="list-style-type: none"> ◦ Both the eastbound and the northbound approach is expected to require 4 lanes at the intersection. This will require widening of the existing road and may have higher right-of way impact on adjacent properties. <p><u>Overall Intersection LOS</u></p> <ul style="list-style-type: none"> • Even with major geometric improvements, this intersection is expected to operate at LOS E during the PM peak hour. <p><u>Individual Movement LOS</u></p> <ul style="list-style-type: none"> • Five of the individual movements would operate at LOS E or worse during either of the peak hour. 	<p><u>Extent of Geometric Improvements</u></p> <ul style="list-style-type: none"> • The extent of geometric improvements at this location will be lesser on the Superstreet Alternative: <ul style="list-style-type: none"> ◦ Both the eastbound and the northbound approach is expected to require 3 lanes at the intersection. Right-of way impact on adjacent properties is expected to be lower in this alternative. <p><u>Overall Intersection LOS</u></p> <ul style="list-style-type: none"> • The overall intersection is expected to operate at LOS C or better during both the peak hours. <p><u>Individual Movement LOS</u></p> <ul style="list-style-type: none"> • None of the movement is expected to operate at LOS E or worse during either of the peak hour.

The superstreet also has the following added benefits that are not typically accounted for in the traffic operation analysis:

Increased Safety

The superstreet intersection reduces the number of conflict points at an intersection, providing safety and operational benefits by reducing the number of signal phases and conflicting volumes at a single location. The conventional full movement intersection has **18 more total conflict points than a superstreet intersection**. A four-leg conventional intersection has a total of 32 conflict points, of which 16 are merging or diverging, 12 are crossing (left-turn) and four are crossing (angle). A four-leg superstreet intersection has a total of 14 conflict points of which 12 are merging or diverging, 2 are crossing (left-turn), and none are crossing (angle).

By reducing the number of conflict points, superstreet intersections provide a safer operating condition for the motorist and pedestrian alike.

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Better Pedestrian/Bike Accommodation

Superstreets provide better accommodation for pedestrian and bikes at intersections. The superstreet provides median refuge for pedestrians and bikes, thereby promoting safer crossing. Also, in a superstreet configuration, bikes/pedestrians have a fewer number of conflict points with pedestrians.

Signal Progression

The Superstreet alternative also provides improved progression along the corridor since the left turn phases are eliminated.

Robustness in Meeting Future Demand

The study area corridor under the Superstreet configuration will have additional capacity that would be lacking in a traditional intersection. Because of this additional capacity, the superstreet may be able to accommodate unexpected developments and changes in traffic pattern in the future compared to traditional intersections.

Because of these benefits, it is recommended that Alternative 2, the Superstreet, be considered as a preferred alternative even though the overall operation at most study area intersections would be comparable.

If superstreet alternative is not considered as a preferred alternative for the overall corridor, then at a minimum, the following intersections should be converted into a superstreet based on the benefit comparison presented in Table 8:

- McKee Road/McKee Road Extension at Old Monroe Road
- Stallings Road/Potter Road at Old Monroe Road
- Indian Trail Road/Waxhaw Indian Trail Road at Old Monroe Road
- Wesley Chapel Stouts Road at Old Monroe Road

Addendum



Attachment A Traffic Forecast and Intersection Breakouts

For Attachments please contact:

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Addendum



Attachment B Synchro Analysis Results for Alternative 1

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Addendum



Attachment C Synchro Analysis Results for Alternative 2

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