TECHNICAL APPENDIX

APPENDIX A

SCOPING DOCUMENTATION

DRMP

December 22, 2025

Michael Elabarger
Interim Planning Director
Town of Rolesville
211 S. Main Street
P.O. Box 250
Rolesville, NC 27571
P: 919-554-6517
E: michael.elabarger@rolesville.nc.gov

Reference: Opal at Main – Rolesville, NC

Subject: Memorandum of Understanding for TIA Report

Dear Michael:

The following is a Memorandum of Understanding (MOU) outlining the proposed scope of work and assumptions related to the Traffic Impact Analysis (TIA) for the proposed Optal at Main development, to be located east along the intersection of Young Street and Nortwick Road in Rolesville, North Carolina. Refer to the attached site location map. The proposed development, expected to be completed in 2030, is assumed to consist of 2 single-family detached homes and 71 single-family attached homes. Site access is proposed via two (2) full-movement driveways, one (1) along Young Street and one (1) along North Main Street. Refer to the attached site plan.

Study Area

The study area is proposed to consist of the following intersections:

- Main Street & Young Street
- Main Street & Williams Street
- Young Street & Scarboro Street / Proposed Site Access A
- Young Street & Granite Falls Boulevard
- Main Street and Proposed Site Access B

Note: NCDOT has expressed concerns regarding the proximity of the Main Street site access B and existing Williams Street. The TIA will study the intersection as a full movement; however, recommendations may be necessary in order to shift the driveway to add more separation between the two intersections and/or restrict the access to prevent left-turn traffic.

Background Traffic Volumes

Traffic volumes will be estimated by projecting 2025 existing traffic volumes to the year 2030 using an annual growth rate. The historical AADT data attached from NCDOT indicates a growth rate of 1.30% in the study area. DRMP recommends using a background growth rate of 3.0 percent based on engineering judgement. Several factors were considered when making this judgment. There are several approved developments in the area that are under construction and expected to contribute to future growth. A 3.0 percent growth rate is commonly used in similar contexts and is considered appropriate to account for background traffic growth associated with nearby and planned developments. Major nearby developments with available traffic impact analyses will be included in the TIA, while smaller or more distant developments will be incorporated within the assumed growth rate. Adjacent developments that will be included in the study are summarized below.

Table 1: Adjacent Developments

Adjacent Developments	Land Use / Intensity
Parker Ridge	162 single-family detached homes and 114 single-family attached homes
Rolesville Town Center	34,000 SF Town Hall, 26,200 SF Police Station, 23,900 SF Fire Station, 22,500 SF Community Center, 12,000 SF County Library
Young Street PUD	250 Multifamily Housing, 650 Single family attached Housing and 108,200 Shopping Center

Traffic associated with the following adjacent developments will be captured within the assumed 3.0 percent annual background growth rate:

- 1216 Rolesville Road
- 302 S Main St – Learning Experience Rolesville
- 414 S. Main Street – Pine Glo Sports complex
- 6000 Rogers Road
- A-Master Team Townhomes
- Woodlief Assemblage
- Cobblestone Village
- North Wake Eye Center

- Jones Dairy Road

Future Roadway Improvements

STIP U-6241 was identified within the study area and considered under future traffic conditions. The project includes improvements to SR 2051 (Burlington Mills Road) from US 401 east of Rolesville Middle School to US 401 Business (South Main Street) in Rolesville, Wake County. STIP U-6241 is expected to realign the roadway and construct a new intersection with South Main Street, along with sidewalk extensions and complete streets improvements.

Trip Generation

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 12th Edition. Refer to Table 2 for a summary of the proposed site trip generation for full buildout of the proposed development.

Table 2: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vph)	Weekday AM Peak Hour Trips (vph)			Weekday PM Peak Hour Trips (vph)		
			Enter	Exit	Total	Enter	Exit	Total
Single-Family Detached Housing (210)	2 DU	18	2	5	7	2	1	3
Single-Family Attached Housing (215)	71 DU	467	7	20	27	19	14	33
Total Trips		**485**	**9**	**25**	**34**	**21**	**15**	**36**

Trip Distribution and Assignment

Refer to the attached site trip distributions. Site trip distributions will be reviewed once traffic counts are obtained. Any adjustments to the trip distributions will be coordinated with the Town and NCDOT.

Analysis Scenarios

All capacity analyses will be performed utilizing Synchro (Version 11.1). All study intersections will be analyzed during the weekday AM and PM peak hours under the following proposed traffic scenarios:

- 2025 Existing Traffic Conditions
- 2030 No-Build Traffic Conditions
- 2030 Build Traffic Conditions
- 2030 Build with Improvements Traffic Conditions

Report

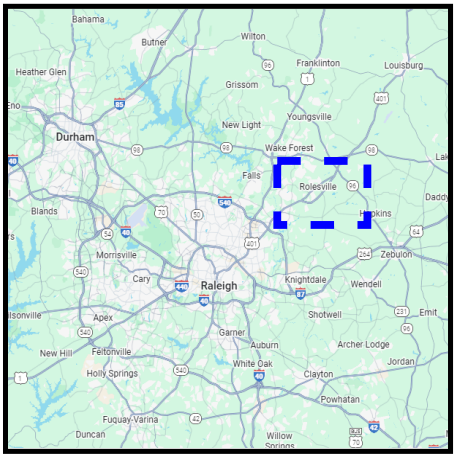
The TIA report will be prepared based on Town and NCDOT requirements.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

Caroline Cheeves, PE
Traffic Analysis Project Manager
DRMP, Inc.

Attachments: Site Location Map
Site Plan
Existing Peak Hour Traffic
Site Trip Distribution
Growth Rate



N

LEGEND

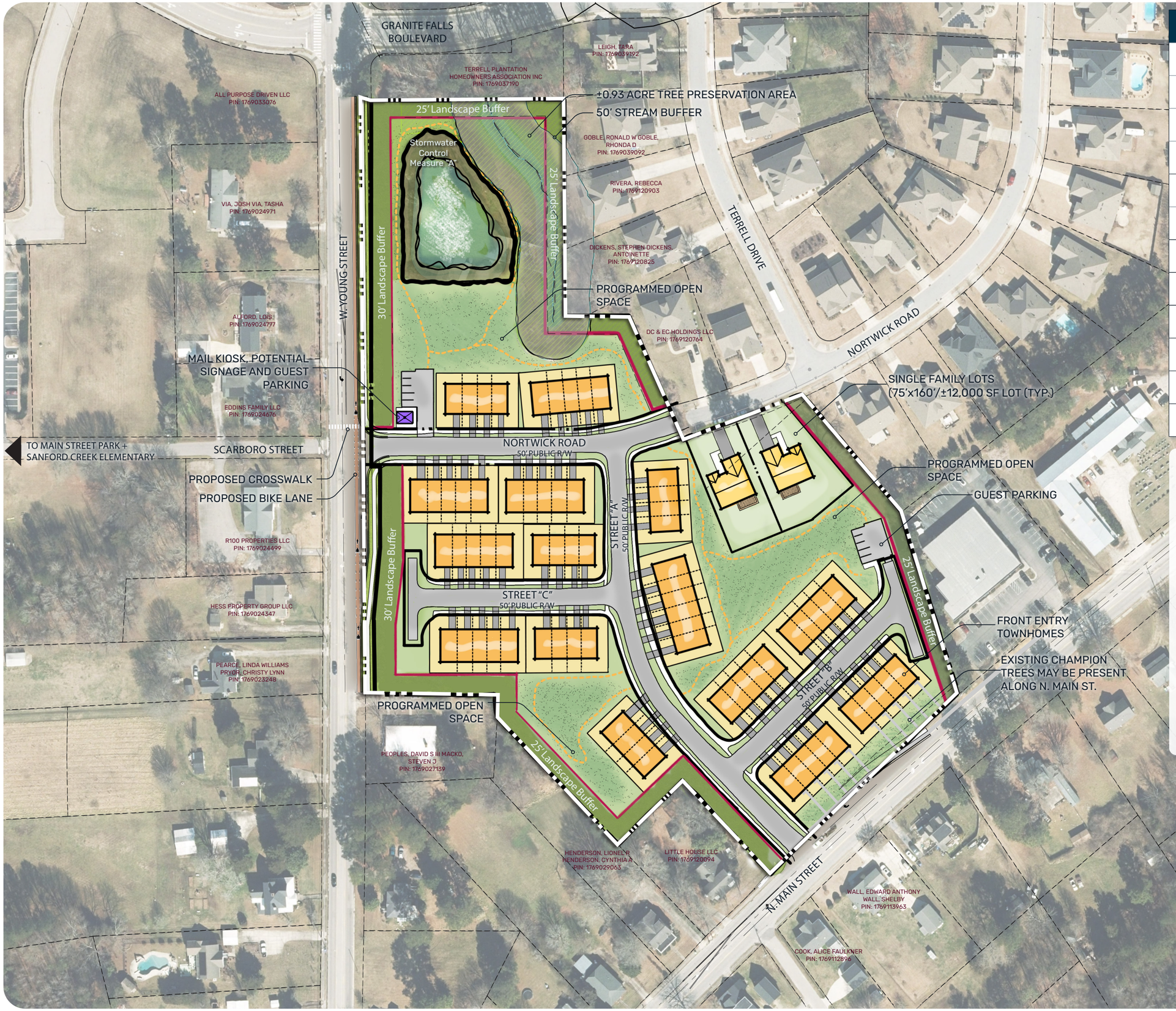
- Study Intersection
- Proposed Site Access
- Study Area

DRMP

Opal at Main
Rolesville, NC

Site Location Map

Scale: Not to Scale | Figure 1



SITE DATA TABLE

PIN(S)	1769027985 1769029362
Total Site Area	± 11.5 acres
Current Zoning	RL
Proposed Zoning	RHD
Tree Preservation Area Required (10% Site Area)	± 0.92 acre
Tree Preservation Area Provided	± 0.93 acre
Open Space Required (15% Site Area)	± 1.72 acre
Open Space Provided	± 1.75 acre
Proposed Residential Units	± 73 DU
Townhome Units	71 units
Single Family Lots	2 lots
Maximum Density	To be determined

CONCEPT PLAN NOTES

01 Development on this site will comply with the Town's Unified Development Ordinance and other applicable standards and plans adopted by the Town of Rolesville

02 Sidewalks, trails, and open space areas shown on this plan are approximate. Final location and design to be determined at site or subdivision plan review.

03 Utilities and easements shown on this plan are conceptual. Final location and design to be determined at site or subdivision plan review.

04 Where a conflict between graphic representation and text information on this sheet is present, the text shall prevail.

05 All base file information taken from GIS is subject to change unless otherwise stated.

06 All assumptions shown herein are in accordance with current LDO standards as of the date shown on the plan. Changes to LDO standards, or jurisdictional text changes after that date may impact plan.

07 Lighting requirements will comply with the standards set forth in the LDO.

08 Master plan is conceptual, with final layout to be determined at subdivision plan.

09 Tree coverage areas are conceptual, with final location to be determined at subdivision plan.

McADAMS

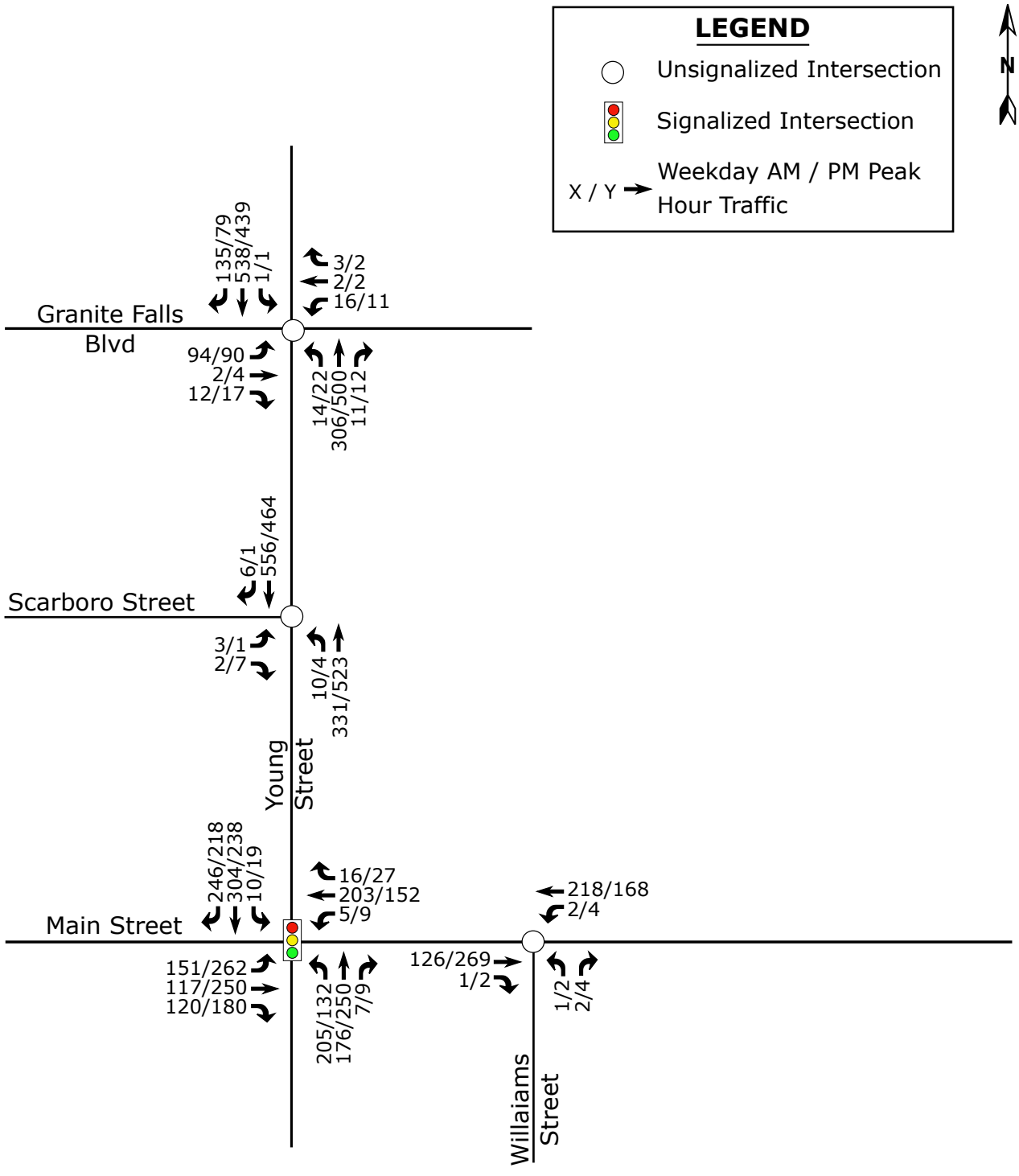
PREPARED FOR:
Fischer Homes

Opal at Main Concept Site Plan

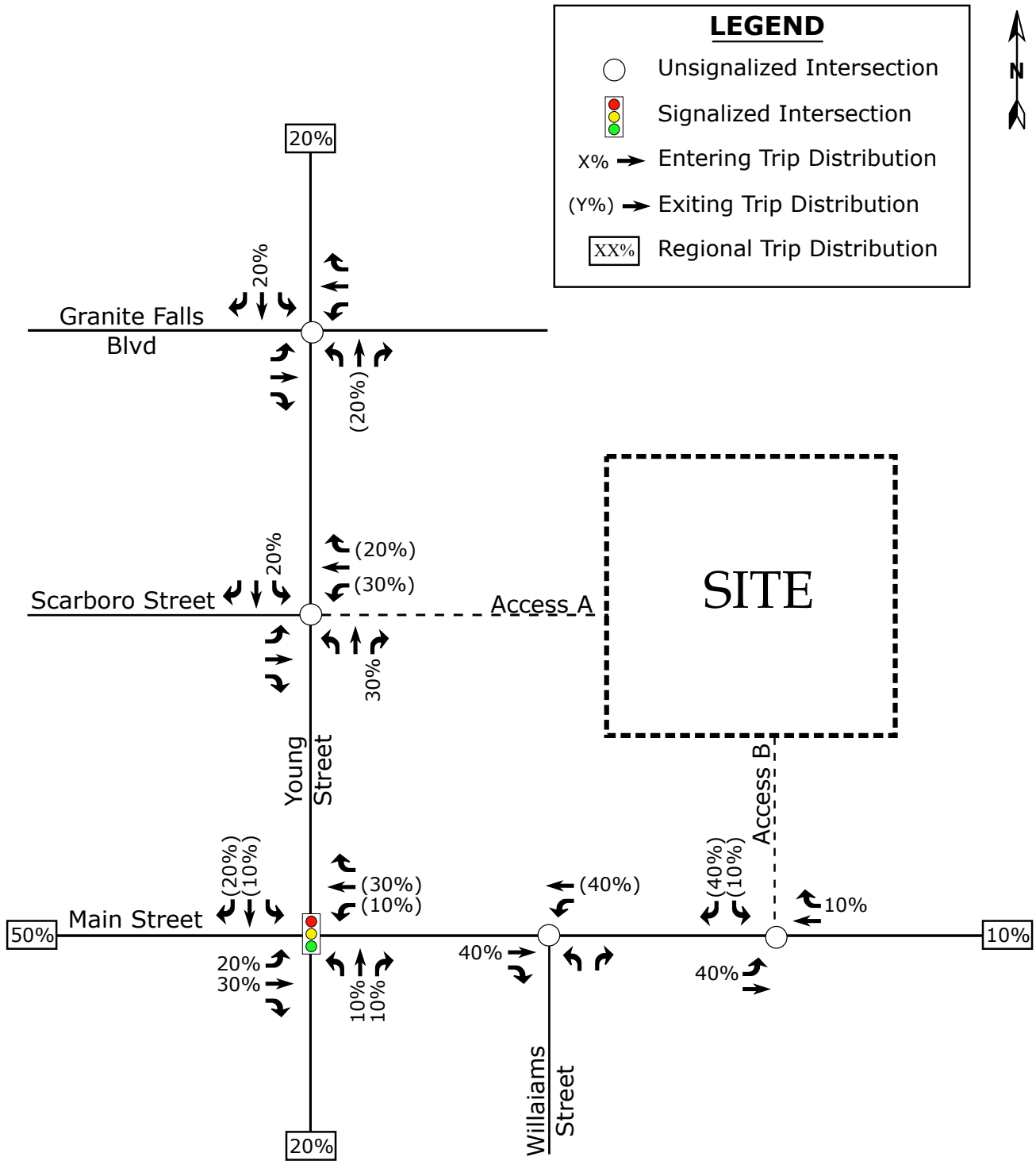
Rolesville, North Carolina
Rolesville Case # REZ-25-04

10' 60'
SCALE: 1" = 60'

SPEC24634
10. 30. 2025



DRMP	Opal at Main Rolesvile, NC	2025 Existing Peak Hour Traffic
		Scale: Not to Scale



DRMP	Opal at Main Rolesvile, NC	Site Trip Distribution
		Scale: Not to Scale

HISTORICAL TRAFFIC GROWTH RATE

Year	Road Name: Young Street Route ID: SR 1945 Station #: 0920001451	Road Name: Main Street Route ID: US 401 Bus Station #: 0920000325	Road Name: Main Street Route ID: US 401 Bus Station #: 0920000314
2023	10,500	4,100	12,000
2022			
2021	8,600	3,100	11,500
2020		3500	9400
2019	8,600	3,800	11,500
2018			
2017	7,800	4,000	11,000
2016		3600	12000
2015	7,900		14,000
2014			
2013			

2013-2023	3.62%	1.88%	-1.70%	**1.3%** **Average Growth Rate**

APPENDIX B

TRAFFIC COUNTS

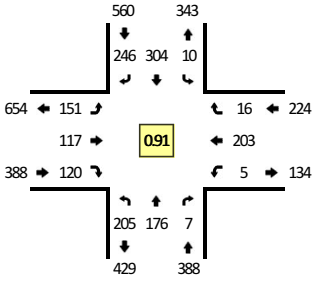
Type of peak hour being reported: Intersection Peak

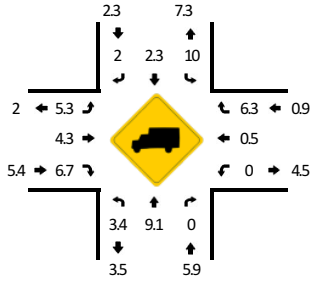
Method for determining peak hour: Total Entering Volume

LOCATION: Young St -- Main St
CITY/STATE: Rolesville, NC

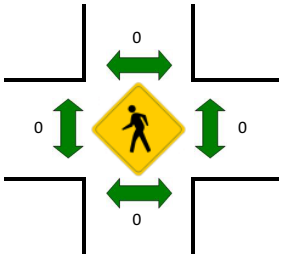
QC JOB #: 17376501
DATE: Thu, Dec 11 2025

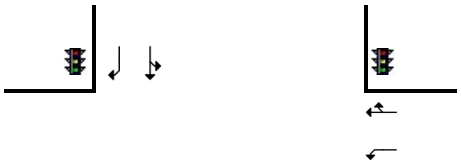
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

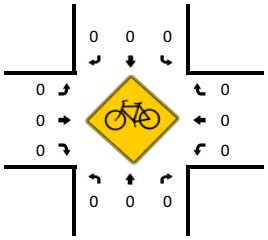


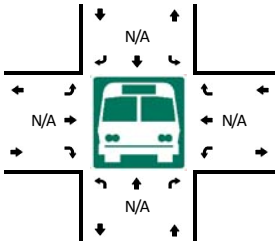


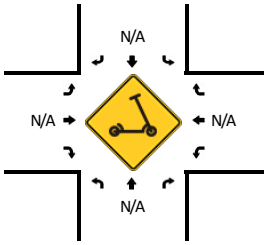
TRUE DATA TO IMPROVE MOBILITY











15-Min Count Period Beginning At	Young St (Northbound)				Young St (Southbound)				Main St (Eastbound)				Main St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	38	31	0	0	0	94	43	0	13	20	55	0	2	43	1	0	340	
7:15 AM	53	42	0	0	1	56	58	0	31	28	33	0	3	48	3	0	356	
7:30 AM	55	53	2	0	4	92	64	0	30	25	31	0	1	66	7	0	430	
7:45 AM	47	40	2	0	1	79	75	0	39	28	30	0	0	53	4	0	398	1524
8:00 AM	50	41	3	0	4	77	49	0	51	36	26	0	1	36	2	0	376	1560
8:15 AM	27	37	1	0	1	61	61	0	27	26	31	0	2	35	4	0	313	1517
8:30 AM	40	32	0	0	1	46	36	0	33	20	24	0	0	47	3	0	282	1369
8:45 AM	55	33	4	0	1	65	71	0	37	21	35	0	1	44	5	0	372	1343

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	220	212	8	0	16	368	256	0	120	100	124	0	4	264	28	0	1720
Heavy Trucks	4	12	0		4	8	12		8	8	12		0	4	4		76
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/17/2025 10:27 AM

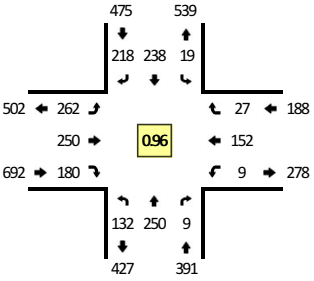
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

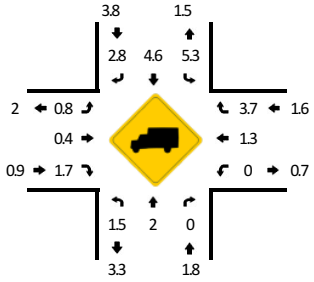
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: Young St -- Main St
CITY/STATE: Rolesville, NC

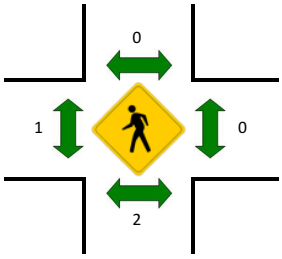
QC JOB #: 17376502
DATE: Thu, Dec 11 2025

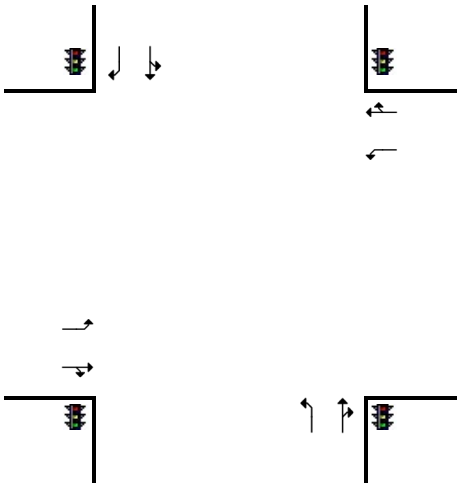
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

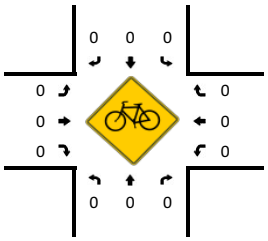


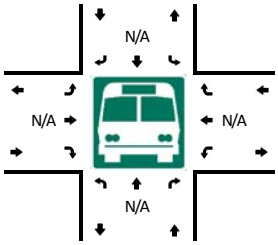


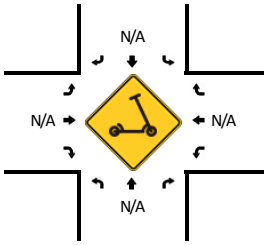
TRUE DATA TO IMPROVE MOBILITY











15-Min Count Period Beginning At	Young St (Northbound)				Young St (Southbound)				Main St (Eastbound)				Main St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	27	65	3	0	5	43	49	0	66	68	57	0	1	36	7	0	427	
4:15 PM	38	76	1	0	7	43	59	0	38	59	36	0	4	34	1	0	396	
4:30 PM	29	74	2	0	7	59	51	0	65	57	48	0	2	34	4	0	432	
4:45 PM	31	75	4	0	4	48	47	0	73	62	32	0	3	41	4	0	424	1679
5:00 PM	39	56	0	0	3	54	54	0	53	66	47	0	1	39	6	0	418	1670
5:15 PM	39	47	4	0	3	59	64	0	71	62	47	0	3	42	7	0	448	1722
5:30 PM	23	72	1	0	9	77	53	0	65	60	54	0	2	30	10	0	456	1746
5:45 PM	37	55	3	0	1	51	39	0	69	54	44	0	0	23	7	0	383	1705

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	92	288	4	0	36	308	212	0	260	240	216	0	8	120	40	0	1824
Heavy Trucks	0	8	0		4	24	0		4	0	0		0	0	0		40
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

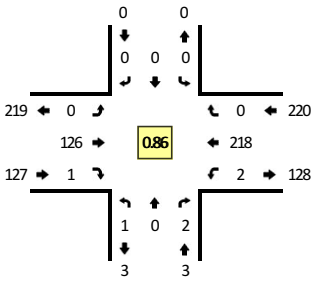
Report generated on 12/17/2025 10:27 AM

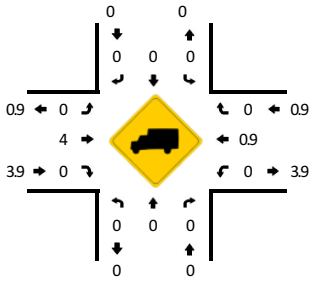
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

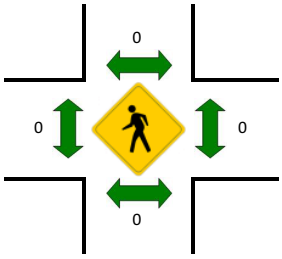
LOCATION: Williams St -- Main St | **QC JOB #:** 17376503
CITY/STATE: Rolesville, NC | **DATE:** Thu, Dec 11 2025

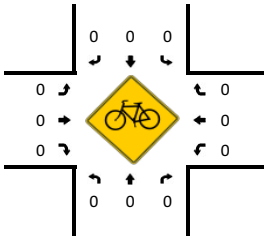
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

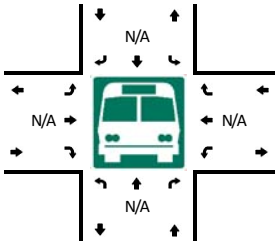


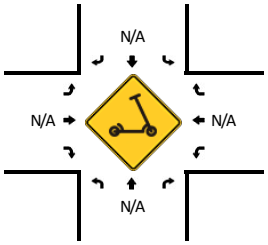


TRUE DATA TO IMPROVE MOBILITY









15-Min Count Period Beginning At	Williams St (Northbound)				Williams St (Southbound)				Main St (Eastbound)				Main St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	0	1	0	0	0	0	0	0	20	0	0	1	44	0	0	67	
7:15 AM	0	0	0	0	0	0	0	0	0	29	0	0	1	54	0	0	84	
7:30 AM	0	0	2	0	0	0	0	0	0	27	0	0	0	73	0	0	102	
7:45 AM	0	0	0	0	0	0	0	0	0	28	0	0	1	54	0	0	83	336
8:00 AM	1	0	0	0	0	0	0	0	0	42	1	0	0	37	0	0	81	350
8:15 AM	1	0	1	0	0	0	0	0	0	28	0	0	1	40	0	0	71	337
8:30 AM	1	0	0	0	0	0	0	0	0	20	0	0	2	50	0	0	73	308
8:45 AM	0	0	1	0	0	0	0	0	0	26	0	0	0	47	0	0	74	299

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	8	0	0	0	0	0	0	108	0	0	0	292	0	0	408
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	8	0		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

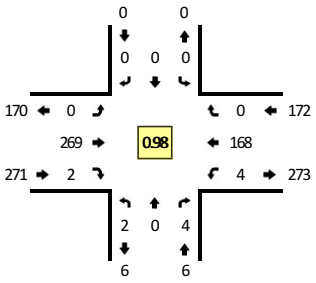
Report generated on 12/17/2025 10:28 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

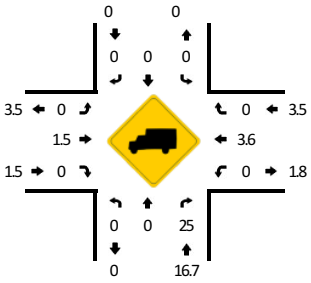
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: Williams St -- Main St
CITY/STATE: Rolesville, NC

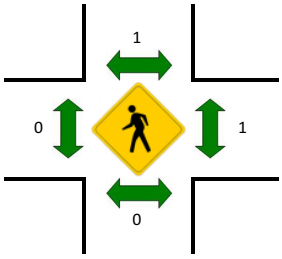
QC JOB #: 17376504
DATE: Thu, Dec 11 2025

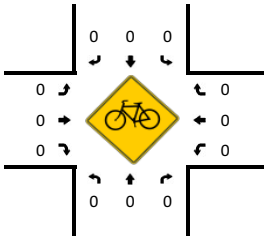
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

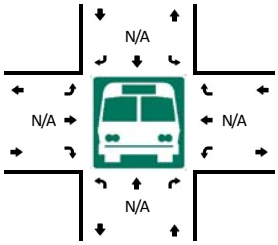


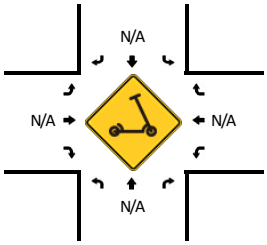


TRUE DATA TO IMPROVE MOBILITY









15-Min Count Period Beginning At	Williams St (Northbound)				Williams St (Southbound)				Main St (Eastbound)				Main St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	1	0	0	0	0	0	0	75	2	0	0	36	0	0	114	
4:15 PM	0	0	2	0	0	0	0	0	0	66	0	0	0	43	0	0	111	
4:30 PM	0	0	3	0	0	0	0	0	0	64	1	0	0	40	0	0	108	
4:45 PM	1	0	0	0	0	0	0	0	0	69	0	0	2	42	0	0	114	447
5:00 PM	0	0	1	0	0	0	0	0	0	68	1	0	0	42	0	0	112	445
5:15 PM	1	0	0	0	0	0	0	0	0	68	0	0	2	44	0	0	115	449
5:30 PM	2	0	3	0	0	0	0	0	0	59	0	0	1	40	0	0	105	446
5:45 PM	1	0	1	0	0	0	0	0	0	55	0	0	0	27	0	0	84	416

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	0	0	0	0	0	0	0	272	0	0	8	176	0	0	460
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	8	0		8
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/17/2025 10:28 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

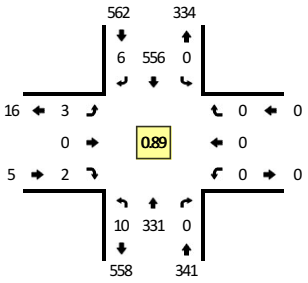
Type of peak hour being reported: Intersection Peak

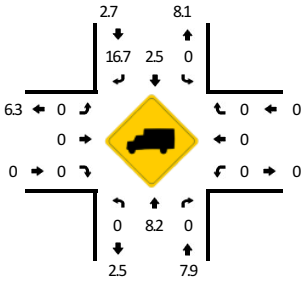
Method for determining peak hour: Total Entering Volume

LOCATION: Young St -- Scarboro St/Site Access
CITY/STATE: Rolesville, NC

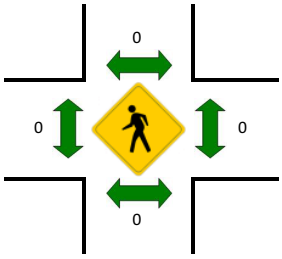
QC JOB #: 17376505
DATE: Thu, Dec 11 2025

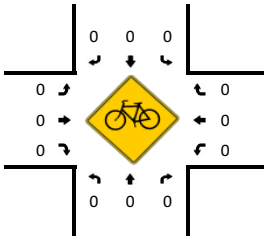
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

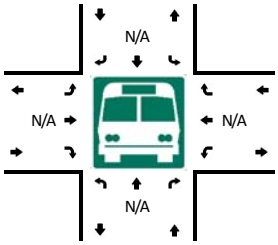


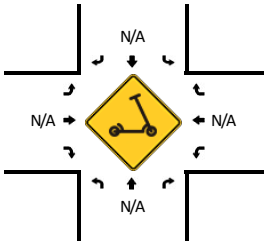


TRUE DATA TO IMPROVE MOBILITY









15-Min Count Period Beginning At	Young St (Northbound)				Young St (Southbound)				Scarboro St/Site Access (Eastbound)				Scarboro St/Site Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	45	0	0	0	133	1	0	0	0	0	0	0	0	0	0	179	
7:15 AM	0	75	0	0	0	123	1	0	0	0	0	0	0	0	0	0	199	
7:30 AM	1	90	0	0	0	162	1	0	0	0	0	0	0	0	0	0	254	
7:45 AM	4	74	0	0	0	150	2	0	1	0	1	0	0	0	0	0	232	864
8:00 AM	5	92	0	0	0	121	2	0	2	0	1	0	0	0	0	0	223	908
8:15 AM	3	64	0	0	0	121	1	0	0	0	0	0	0	0	0	0	189	898
8:30 AM	4	64	0	0	0	87	1	0	1	0	3	0	0	0	0	0	160	804
8:45 AM	5	64	0	0	0	107	2	0	9	0	26	0	0	0	0	0	213	785

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	360	0	0	0	648	4	0	0	0	0	0	0	0	0	0	1016
Heavy Trucks	0	24	0		0	20	0		0	0	0		0	0	0		44
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

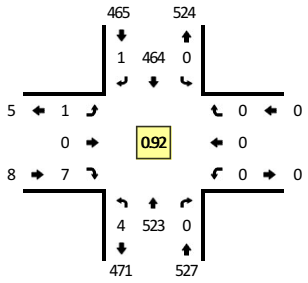
Report generated on 12/17/2025 10:28 AM

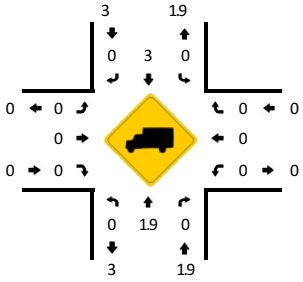
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

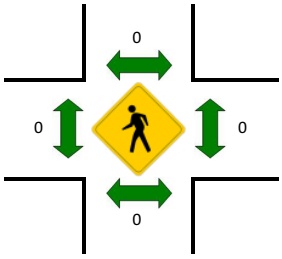
LOCATION: Young St -- Scarboro St/Site Access | **QC JOB #:** 17376506
CITY/STATE: Rolesville, NC | **DATE:** Thu, Dec 11 2025

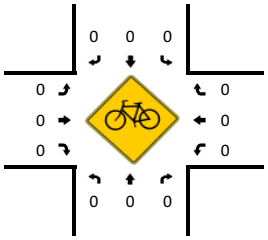
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

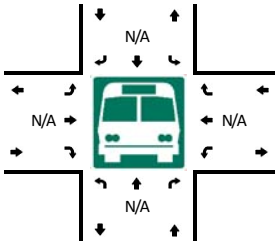


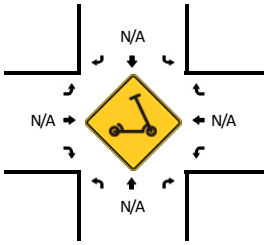


TRUE DATA TO IMPROVE MOBILITY









15-Min Count Period Beginning At	Young St (Northbound)				Young St (Southbound)				Scarboro St/Site Access (Eastbound)				Scarboro St/Site Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	128	0	0	0	84	1	0	6	0	14	0	0	0	0	0	237	
4:15 PM	9	107	0	0	0	99	0	0	4	0	11	0	0	0	0	0	230	
4:30 PM	1	148	0	0	0	109	0	0	1	0	4	0	0	0	0	0	263	
4:45 PM	2	140	0	0	0	108	0	0	0	0	2	0	0	0	0	0	252	982
5:00 PM	0	119	0	0	0	103	1	0	1	0	2	0	0	0	0	0	226	971
5:15 PM	2	120	0	0	0	128	0	0	0	0	0	0	0	0	0	0	250	991
5:30 PM	0	144	0	0	0	125	0	0	0	0	3	0	0	0	0	0	272	1000
5:45 PM	2	126	0	0	0	89	2	0	1	0	4	0	0	0	0	0	224	972

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	576	0	0	0	500	0	0	0	0	12	0	0	0	0	0	1088
Heavy Trucks	0	8	0		0	24	0		0	0	0		0	0	0		32
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/17/2025 10:28 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

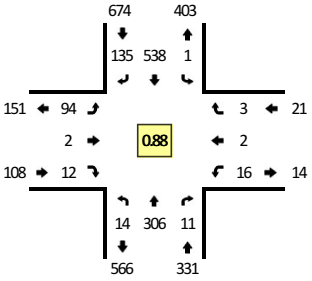
Type of peak hour being reported: Intersection Peak

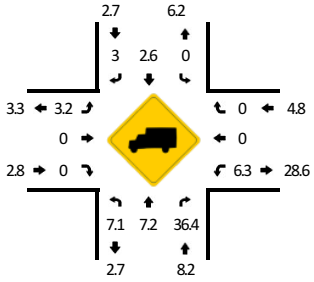
Method for determining peak hour: Total Entering Volume

LOCATION: Young St -- Granite Falls Blvd
CITY/STATE: Rolesville, NC

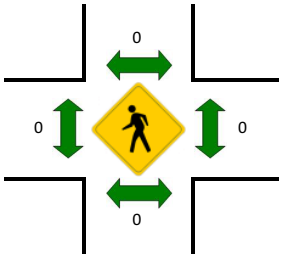
QC JOB #: 17376507
DATE: Thu, Dec 11 2025

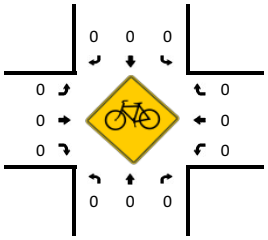
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

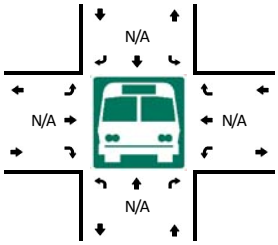


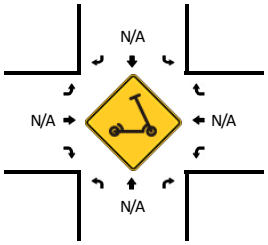


TRUE DATA TO IMPROVE MOBILITY









15-Min Count Period Beginning At	Young St (Northbound)				Young St (Southbound)				Granite Falls Blvd (Eastbound)				Granite Falls Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	47	0	0	1	122	16	0	7	0	6	0	4	1	2	0	206	
7:15 AM	3	70	1	0	0	117	36	0	32	0	4	0	4	0	3	0	270	
7:30 AM	5	84	2	0	1	160	44	0	21	0	2	0	4	1	0	0	324	
7:45 AM	1	72	1	0	0	147	31	0	25	2	3	0	3	0	0	0	285	1085
8:00 AM	5	80	7	0	0	114	24	0	16	0	3	0	5	1	0	0	255	1134
8:15 AM	5	59	1	0	3	114	21	0	10	2	1	0	5	2	0	0	223	1087
8:30 AM	2	61	1	0	0	81	31	0	11	0	2	0	3	0	0	0	192	955
8:45 AM	5	66	1	0	1	101	40	0	26	0	7	0	1	0	1	0	249	919

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	336	8	0	4	640	176	0	84	0	8	0	16	4	0	0	1296
Heavy Trucks	0	24	0		0	20	4		4	0	0		0	0	0		52
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/17/2025 10:28 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

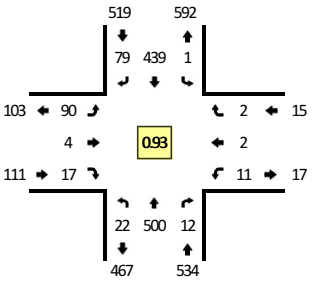
Type of peak hour being reported: Intersection Peak

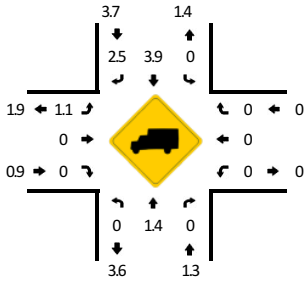
Method for determining peak hour: Total Entering Volume

LOCATION: Young St -- Granite Falls Blvd
CITY/STATE: Rolesville, NC

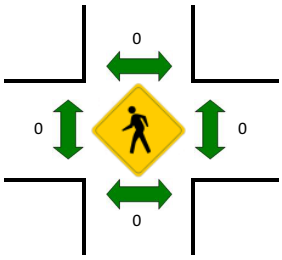
QC JOB #: 17376508
DATE: Thu, Dec 11 2025

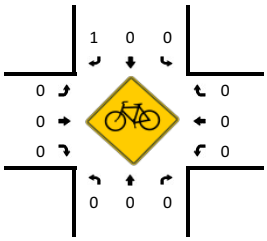
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

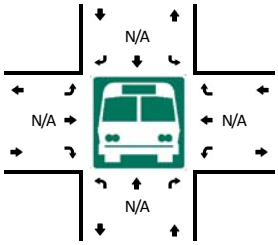


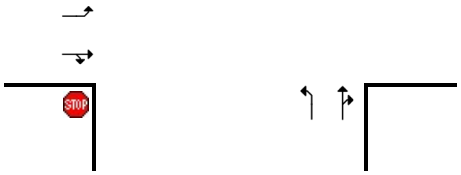


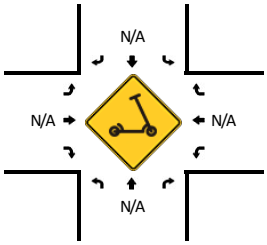
TRUE DATA TO IMPROVE MOBILITY











15-Min Count Period Beginning At	Young St (Northbound)				Young St (Southbound)				Granite Falls Blvd (Eastbound)				Granite Falls Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	130	3	0	0	80	18	0	37	3	7	0	0	0	1	0	283	
4:15 PM	8	102	0	0	0	89	30	0	23	0	9	0	1	0	0	0	262	
4:30 PM	6	134	6	1	1	100	16	0	19	4	6	0	1	0	1	0	295	
4:45 PM	3	137	4	0	0	98	18	0	23	1	4	0	5	0	0	0	293	1133
5:00 PM	8	109	2	0	0	101	21	0	22	2	6	0	1	0	0	0	272	1122
5:15 PM	4	112	4	0	1	123	21	0	24	1	1	0	4	1	1	0	297	1157
5:30 PM	7	142	2	0	0	117	19	0	21	0	6	0	1	1	1	0	317	1179
5:45 PM	8	111	3	0	0	93	23	0	31	0	3	0	2	0	0	0	274	1160

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	28	568	8	0	0	468	76	0	84	0	24	0	4	4	4	0	1268
Heavy Trucks	0	4	0		0	24	4		0	0	0		0	0	0		32
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/17/2025 10:28 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

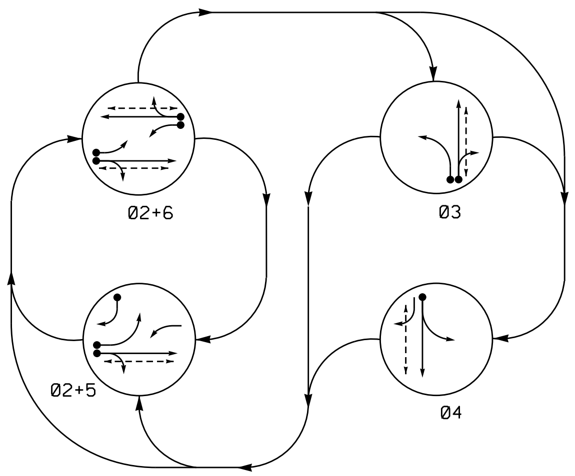
APPENDIX C

SIGNAL PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-6241	Sig. 7.0

4 Phase
Fully Actuated
US 401 Business (Louisburg Rd) (CLS-System 3)
Signal System #: D05-20_Rolesville

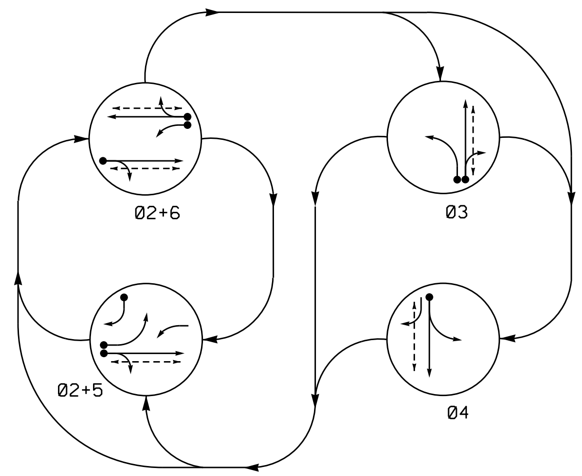
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø3	Ø4	FLASH
21, 22, 23	G	G	R	R	R
31	R	R	G (←)	R	R
32, 33	R	R	G	R	R
41	R	R	R	G (←)	R
42	R/→	R	R	G	R
43	R	R	R	G	R
51	←	← F Y	←R	←R	←R
61	← F Y	← F Y	←R	←R	←R
62, 63	R	G	R	R	R
P21, P22	W	W	DW	DW	DRK
P31, P32	DW	DW	W	DW	DRK
P41, P42	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	DW	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø3	Ø4	FLASH
21, 22, 23	G	G	R	R	R
31	R	R	G (←)	R	R
32, 33	R	R	G	R	R
41	R	R	R	G (←)	R
42	R/→	R	R	G	R
43	R	R	R	G	R
51	←	←R	←R	←R	←R
61	← F Y	← F Y	←R	←R	←R
62, 63	R	G	R	R	R
P21, P22	W	W	DW	DW	DRK
P31, P32	DW	DW	W	DW	DRK
P41, P42	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	DW	DRK

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	70	3	-	2	-	-	X	-	X	-	-
3A	6X40	0	2-4-2	-	3	3.0	-	X	-	X	-	-
3B	6X40	0	2-4-2	-	3	10.0	-	X	-	X	-	-
4A	6X15	50	4	-	4	15.0	-	X	-	X	-	-
4B	6X40	0	2-4-2	-	4	3.0	-	X	-	X	-	-
5A	6X40	0	2-4-2	-	5	15.0*	-	X	-	X	-	-
					2#	-	-	X	-	X	-	-
5B	6X40	0	2-4-2	-	5	15.0	-	X	-	X	-	-
6A	6X6	70	3	-	6	-	-	X	-	X	-	-
6B	6X40	0	2-4-2	-	6	-	-	X	-	X	-	-

* Reduce Delay to 3 seconds during Alternate Phasing Operation.
\# Diasable Phase Call for loop during Alternate Phasing Operation.

NOTES

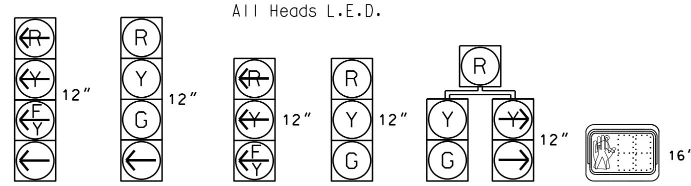
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Install new controller in existing cabinet.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. The Division Traffic Engineer will determine the hours of use for each phasing plan.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

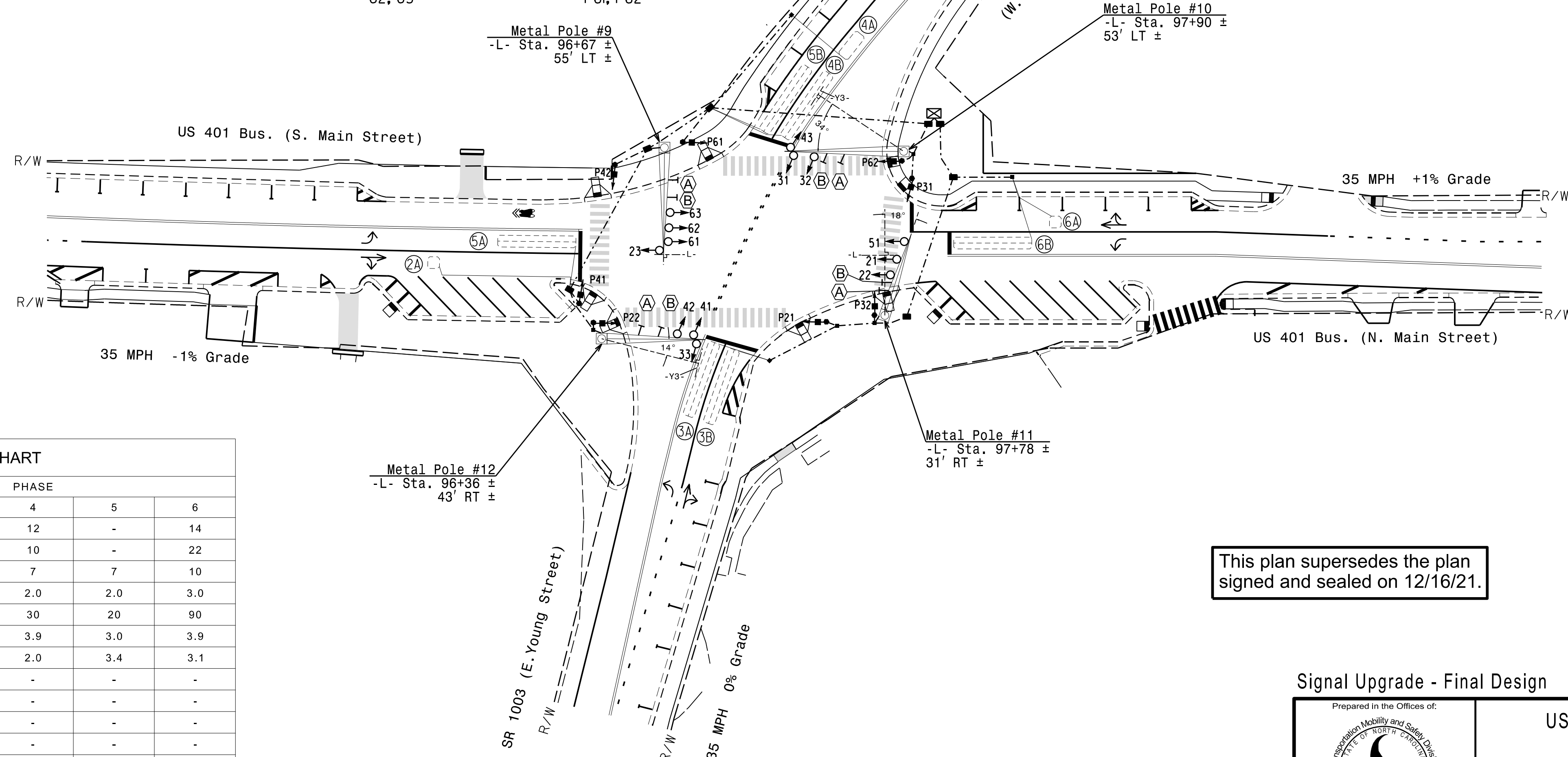
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



51 | 31, 41 | 61 | 21, 22, 23, 32, 33, 43, 62, 63 | 42 | P21, P22, P31, P32, P41, P42, P61, P62



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□→	Pedestrian Signal Head	■→
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
⊠	Controller & Cabinet	
□	Junction Box	■
— X-UC —	2-in Underground Conduit	— UC —
N/A	Right of Way	— — —
→	Directional Arrow	→
	Metal Pole with Mastarm	
— DD —	Directional Drill	N/A
⬡	Type II Signal Pedestal	⬢
OS	Oversized Junction Box	■
N/A	Curb Ramp	
Ⓐ	Street Name Sign (D3-1) By Others	Ⓐ
Ⓑ	Right "TURNING VEHICLES" Yield "TO" Pedestrians Sign (R10-15R)	Ⓑ

This plan supersedes the plan signed and sealed on 12/16/21.

MAXTIME TIMING CHART

FEATURE	PHASE 2	3	4	5	6
Walk *	14	13	12	-	14
Ped Clear	22	12	10	-	22
Min Green *	10	7	7	7	10
Passage *	3.0	2.0	2.0	2.0	3.0
Max 1 *	90	20	30	20	90
Yellow Change	3.9	3.8	3.9	3.0	3.9
Red Clear	3.1	2.1	2.0	3.4	3.1
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Advance Walk	7	6	5	-	7
Non Lock Detector	-	X	X	X	-
Vehicle Recall	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:
Transportation Mobility and Safety Division
State of North Carolina Department of Transportation
Signal Design Section
750 N. Greenfield Pkwy, Garner, NC 27529

US 401 Bus. (Main Street) at SR 1003/SR 1945 (Young Street)

Division 5 | Wake County | Rolesville

PLAN DATE:	October 2025	REVIEWED BY:
PREPARED BY:	C.E. Carter	REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

DocuSigned by: 1B9B4B66274A494... 11/10/2025 DATE

SIG. INVENTORY NO. 05-0119

APPENDIX D

ADJACENT DEVELOPMENT INFORMATION

Figure 6: Trip Assignment

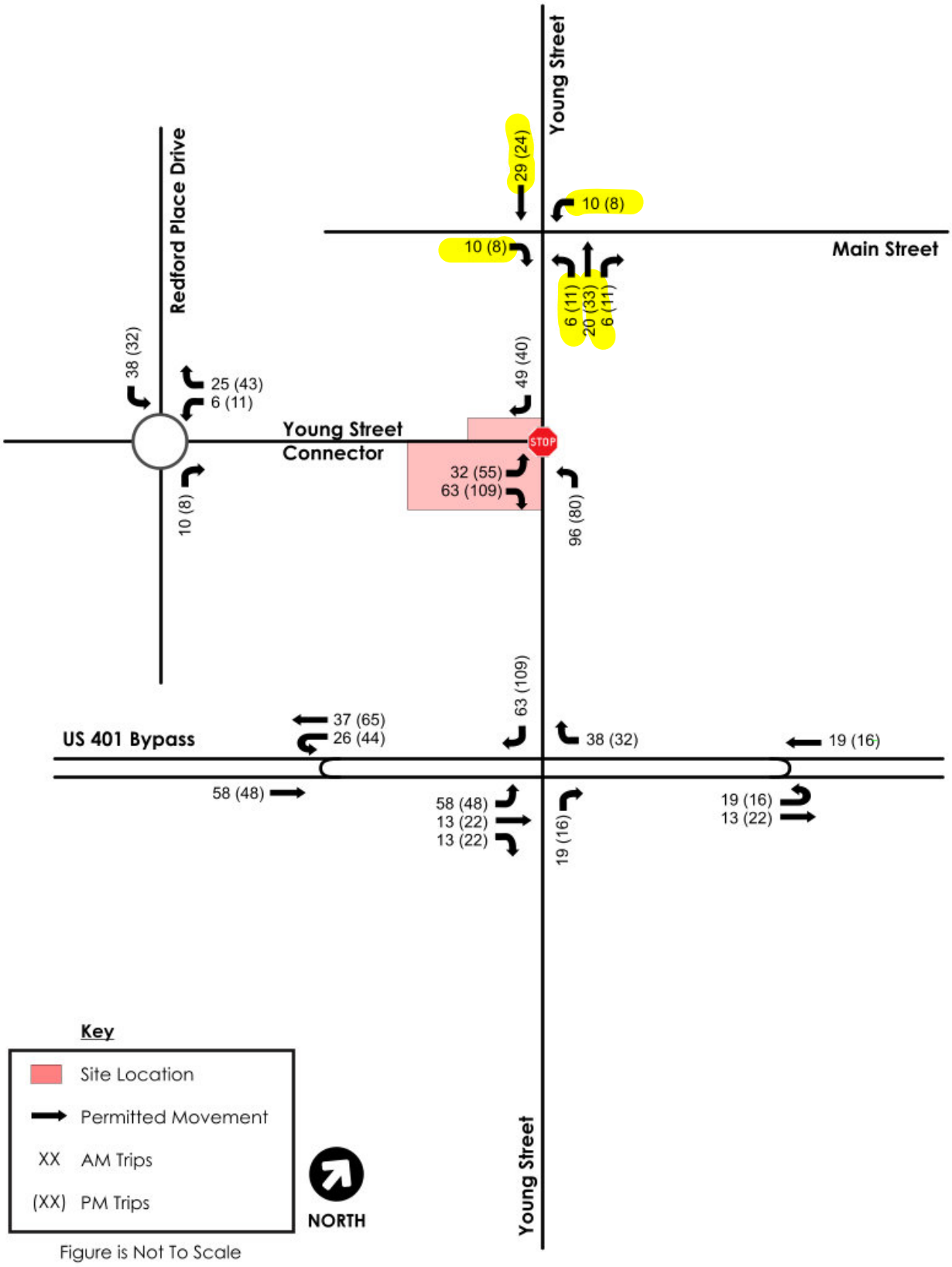


Figure 6: Site Trip Assignment

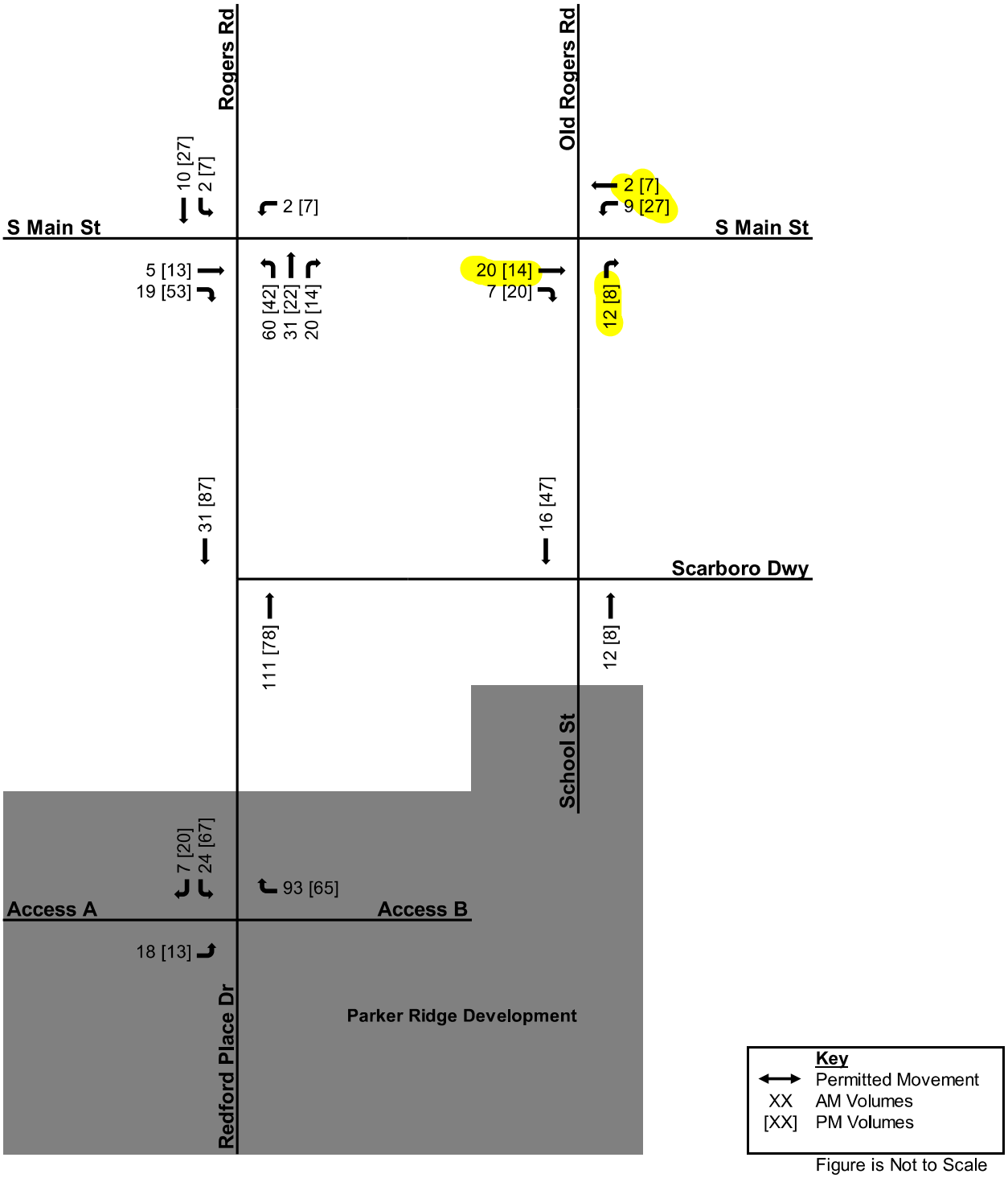


Figure is Not to Scale

NOT TO SCALE

YOUNG ST.

[511] <38> (0) 473
[7] <0> (4) 3

385 (0) <70> [455]
27 (8) <0> [35]

320 (4) <70> [394]
1321 (0) <140> [1461]
181 (0) <25> [206]

1316 (2) <25> [1343]

[36] <0> (11) 25
[90] <0> (25) 65

[582] <38> (25) 519

1491 (14) <140> [1645]
349 (11) <38> [398]

VIRGINIA WATER DR.

US-401 BYPASS EB

[719] <211> (2) 506
[516] <47> (6) 463

695 (2) <257> [954]

[59] <0> (5) 54
[280] <0> (6) 274
[862] <190> (6) 666

[0] <0> (0) 0
[1060] <215> (6) 839

US-401 BYPASS WB

1491 (14)
349 (11) <38>

[802] <152> (5) 645

CENTURY FARM RD.

6 (0) <0> [6]
1 (0) <0> [1]

1 (0) <0> [1]
685 (2) <257> [944]

QUARRY RD.

157 (0) <0> [157]
0 (0) <0> [0]
34 (0) <0> [34]

[213] <0> (0) 213
[699] <63> (6) 630
[152] <152> (0) 0

YOUNG ST.

69 (0) <0> [69]
530 (2) <94> [626]
0 (0) <10> [10]

[163] <163> (0) 0
[0] <0> (0) 0
[94] <94> (0) 0

[775] <104> (6) 665
[53] <53> (0) 0

600 (2) <24> [626]
0 (0) <25> [25]

195 (0) <0> [195]
0 (0) <0> [0]
91 (0) <0> [91]

ROLESVILLE HIGH SCHOOL DRWY.

213 (0) <0> [213]
418 (2) <35> [455]
0 (0) <3> [3]

16 (0) <0> [16]
184 (0) <0> [184]
52 (0) <0> [52]

MITCHELL MILL RD.

8 (0) <0> [8]
274 (2) <38> [314]
9 (0) <0> [9]

[80] <80> (0) 0
[108] <108> (0) 0

[299] <0> (0) 299
[519] <201> (6) 312
[10] <10> (0) 0

[14] <14> (0) 0
[0] <0> (0) 0
[9] <9> (0) 0

[16] <0> (0) 16
[370] <70> (6) 294
[237] <140> (0) 97

[124] <0> (0) 124
[17] <0> (0) 17
[2] <0> (0) 2

NORTHERN SITE DRWY.

CENTRAL SITE DRWY.

SOUTHERN SITE DRWY.

ROLESVILLE RD.

SOUTH SITE

GENOVESA DR.

0 (0) <0> [0]
28 (0) <0> [28]
3 (12) <0> [15]

5 (36) <0> [41]
0 (0) <0> [0]
2 (19) <0> [21]

[1] <0> (0) 1
[0] <0> (0) 0
[5] <0> (0) 5

[2] <0> (0) 2
[41] <0> (0) 41
[6] <0> (6) 0

NORTH SITE

LEGEND

XX BACKGROUND TRAFFIC
(XX) SITE TRAFFIC – NORTH SIDE
<XX> SITE TRAFFIC – SOUTH SIDE
[XX] TOTAL BUILD–OUT TRAFFIC

FIGURE 14

PROJECTED (2025) BUILD–OUT AM PEAK HOUR TRAFFIC VOLUMES – COMMERCIAL BUILD–OUT

YOUNG STREET PUD
ROLESVILLE, NC
TRAFFIC IMPACT ANALYSIS

Kimley»Horn

PROJECTED (2025)
BUILD–OUT AM PEAK HOUR
TRAFFIC VOLUMES –
RESIDENTIAL BUILD–OUT

FIGURE
11

YOUNG STREET PUD
ROLESVILLE, NC
TRAFFIC IMPACT ANALYSIS

Kimley»Horn

NOT TO SCALE

YOUNG ST.

347 (0) <56> [403]
39 (28) <0> [67]

251 (12) <56> [319]
534 (0) <113> [647]
149 (0) <51> [200]

565 (6) <51> [622]

US-401 BYPASS EB

[544] <169> (6) 369
[1103] <38> (4) 1061

469 (6) <207> [682]

CENTURY FARM RD.

1 (0) <0> [1]
2 (0) <0> [2]

2 (0) <0> [2]
471 (6) <207> [684]

QUARRY RD.

88 (0) <0> [88]
0 (0) <0> [0]
43 (0) <0> [43]

YOUNG ST.

27 (0) <0> [27]
385 (6) <75> {-37} [429]
0 (0) <21> {37} [58]

412 (6) <32> [450]
0 (0) <51> [51]

ROLESVILLE HIGH SCHOOL DRWY.

81 (0) <0> [81]
0 (0) <0> [0]
20 (0) <0> [20]

13 (0) <0> [13]
379 (6) <72> [457]
0 (0) <5> [5]

MITCHELL MILL RD.

17 (0) <0> [17]
44 (0) <0> [44]
15 (0) <0> [15]

46 (0) <0> [46]
259 (6) <77> [342]
8 (0) <0> [8]

[463] <77> (0) 386
[37] <0> (12) 25

[509] <77> (16) 416

[24] <0> (7) 17
[46] <0> (16) 30

[8] <0> (0) 8
[1118] <437> (4) 677

[135] <0> (0) 135
[628]{-56} <129> (4) 551
[364] {56} <308> (0) 0

[694] <96> (4) 594
[108] <108> (0) 0

[80] <0> (0) 80
[621] <162> (4) 455
[21] <21> (0) 0

[15] <0> (0) 15
[316] <56> (4) 256
[149] <113> (0) 36

[53] <0> (0) 53
[116] <0> (0) 116
[8] <0> (0) 8

VIRGINIA WATER DR.

590 (9) <113> [712]
360 (7) <77> [444]

[150] <0> (16) 134
[965] <0> (4) 961
[925] <386> (4) 535

[1594] <308> (16) 1270

US-401 BYPASS WB

GENOVESA DR.

3 (0) <0> [3]
34 (0) <0> [34]
5 (40) <0> [45]

7 (23) <0> [30]
0 (0) <0> [0]
3 (13) <0> [16]

[0] <0> (0) 0
[0] <0> (0) 0
[1] <0> (0) 1

[1] <0> (0) 1
[42] <0> (0) 42
[24] <0> (22) 2

NORTH SITE

NORTHERN SITE DRWY.

[165] {33} <132> (0) 0
[0] <0> (0) 0
[125] {50} <75> (0) 0

CENTRAL SITE DRWY.

[64] <64> (0) 0
[86] <86> (0) 0

SOUTHERN SITE DRWY.

[11] <11> (0) 0
[0] <0> (0) 0
[8] <8> (0) 0

ROLESVILLE RD.

SOUTH SITE

LEGEND

XX BACKGROUND TRAFFIC
(XX) SITE TRAFFIC – NORTH SIDE
<XX> SITE TRAFFIC – SOUTH SIDE
{XX} PASS–BY TRAFFIC
[XX] TOTAL BUILD–OUT TRAFFIC

PROJECTED (2025)
BUILD–OUT PM PEAK HOUR
TRAFFIC VOLUMES –
COMMERCIAL BUILD–OUT

FIGURE 16

YOUNG STREET PUD
ROLESVILLE, NC
TRAFFIC IMPACT ANALYSIS

Kimley»Horn

FIGURE 13

PROJECTED (2025) BUILD–OUT PM PEAK HOUR TRAFFIC VOLUMES – RESIDENTIAL BUILD–OUT

YOUNG STREET PUD
ROLESVILLE, NC
TRAFFIC IMPACT ANALYSIS

Kimley»Horn

APPENDIX E

FUTURE ROADWAY IMPROVEMENTS

PROJECT REFERENCE NO.	SHEET NO.
U-6241	6

Stantec

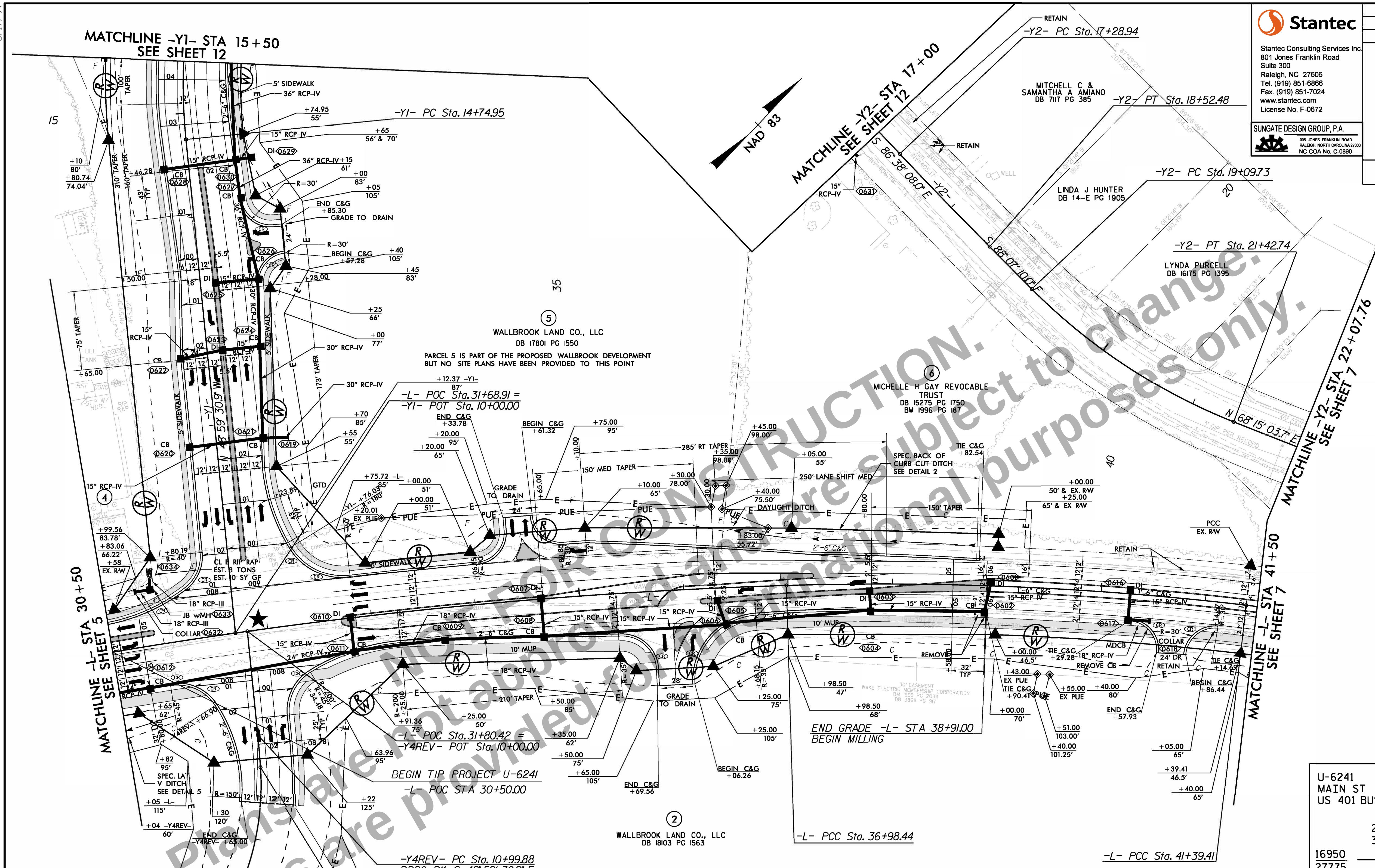
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

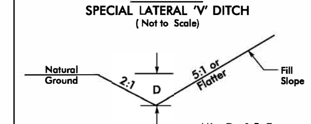
R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

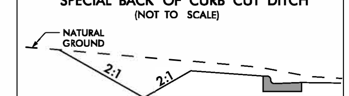
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED


MATCHLINE -Y1- STA 15+50
SEE SHEET 12
MATCHLINE -Y2- STA 17+00
SEE SHEET 12
NAD 83
-Y1- PC Sta. 14+74.95
-Y2- PC Sta. 17+28.94
-Y2- PT Sta. 18+52.48
-Y2- PC Sta. 19+09.73
-Y2- PT Sta. 21+42.74
MITCHELL C & SAMANTHA A AMIANO
DB 7117 PG 385
LINDA J HUNTER
DB 14-E PG 1905
LYNDA PURCELL
DB 16175 PG 1395
WALLBROOK LAND CO., LLC
DB 17801 PG 1550
PARCEL 5 IS PART OF THE PROPOSED WALLBROOK DEVELOPMENT
BUT NO SITE PLANS HAVE BEEN PROVIDED TO THIS POINT
MICHELLE H GAY REVOCABLE TRUST
DB 15275 PG 1750
BM 1996 PG 187
-L- POC Sta. 31+68.91 =
-Y1- POT Sta. 10+00.00
-L- POC Sta. 31+80.42 =
-Y4REV- POT Sta. 10+00.00
BEGIN TIP PROJECT U-6241
-L- POC STA 30+50.00
END GRADE -L- STA 38+91.00
BEGIN MILLING
-L- PCC Sta. 36+98.44
-L- PCC Sta. 41+39.41
WALLBROOK LAND CO., LLC
DB 18103 PG 1563
-Y4REV- PC Sta. 10+99.88
BRDG BK=S 48° 59' 30.9" E
-Y4REV- PCC Sta. 11+30.87
MATCHLINE -Y2- STA 22+07.76
SEE SHEET 7
MATCHLINE -L- STA 41+50
SEE SHEET 7
MATCHLINE -L- STA 30+50
SEE SHEET 5

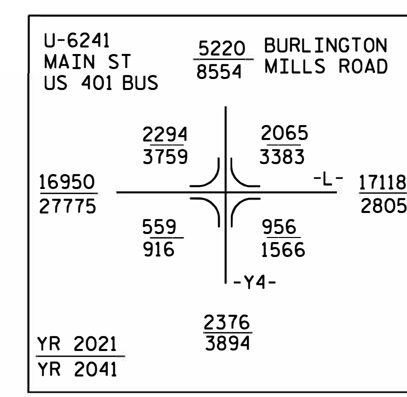
Plans are not approved and are subject to change.
Plans are provided for informational purposes only.
NOT FOR CONSTRUCTION.



DETAIL 5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
FROM STA. 30+50 TO STA. 31+00 -L- RT



DETAIL 2
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)
FROM STA. 36+50 TO STA. 38+80 -L- LT



★ NEW SIGNAL

NOTE:
FOR -L- PROFILE SEE SHEET 15
FOR -Y1- PROFILE SEE SHEET 18
FOR -Y4REV- PROFILE SEE SHEET 20

-L-			-Y1-	-Y2-		-Y4REV-	
PI Sta 33+62.25	PI Sta 39+19.33	PI Sta 43+74.02	PI Sta 16+89.75	PI Sta 17+90.71	PI Sta 20+27.92	PI Sta 11+15.38	PI Sta 13+71.38
Δ = 8° 05' 24.3" (RT)	Δ = 8° 25' 18.5" (RT)	Δ = 2° 20' 06.0" (RT)	Δ = 43° 53' 56.0" (RT)	Δ = 1° 29' 02.0" (LT)	Δ = 23° 37' 46.3" (LT)	Δ = 1° 46' 32.8" (RT)	Δ = 87° 46' 55.7" (RT)
D = 1° 12' 04.2"	D = 1° 54' 35.5"	D = 0° 29' 51.7"	D = 10° 44' 58.8"	D = 1° 12' 04.2"	D = 10° 08' 27.0"	D = 5° 43' 46.5"	D = 22° 55' 05.9"
L = 673.52'	L = 440.97'	L = 469.15'	L = 408.37'	L = 123.54'	L = 233.01'	L = 30.99'	L = 383.02'
T = 337.32'	T = 220.88'	T = 234.61'	T = 214.80'	T = 61.77'	T = 118.19'	T = 15.50'	T = 240.51'
R = 4,770.00'	R = 3,000.00'	R = 11,512.00'	R = 533.00'	R = 4,770.00'	R = 565.00'	R = 1,000.00'	R = 250.00'
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS

8/17/99

9/20/2021
U:\Roadway\Proj\U-6241_Rdy_psh06.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-6241	7

R/W SHEET NO.

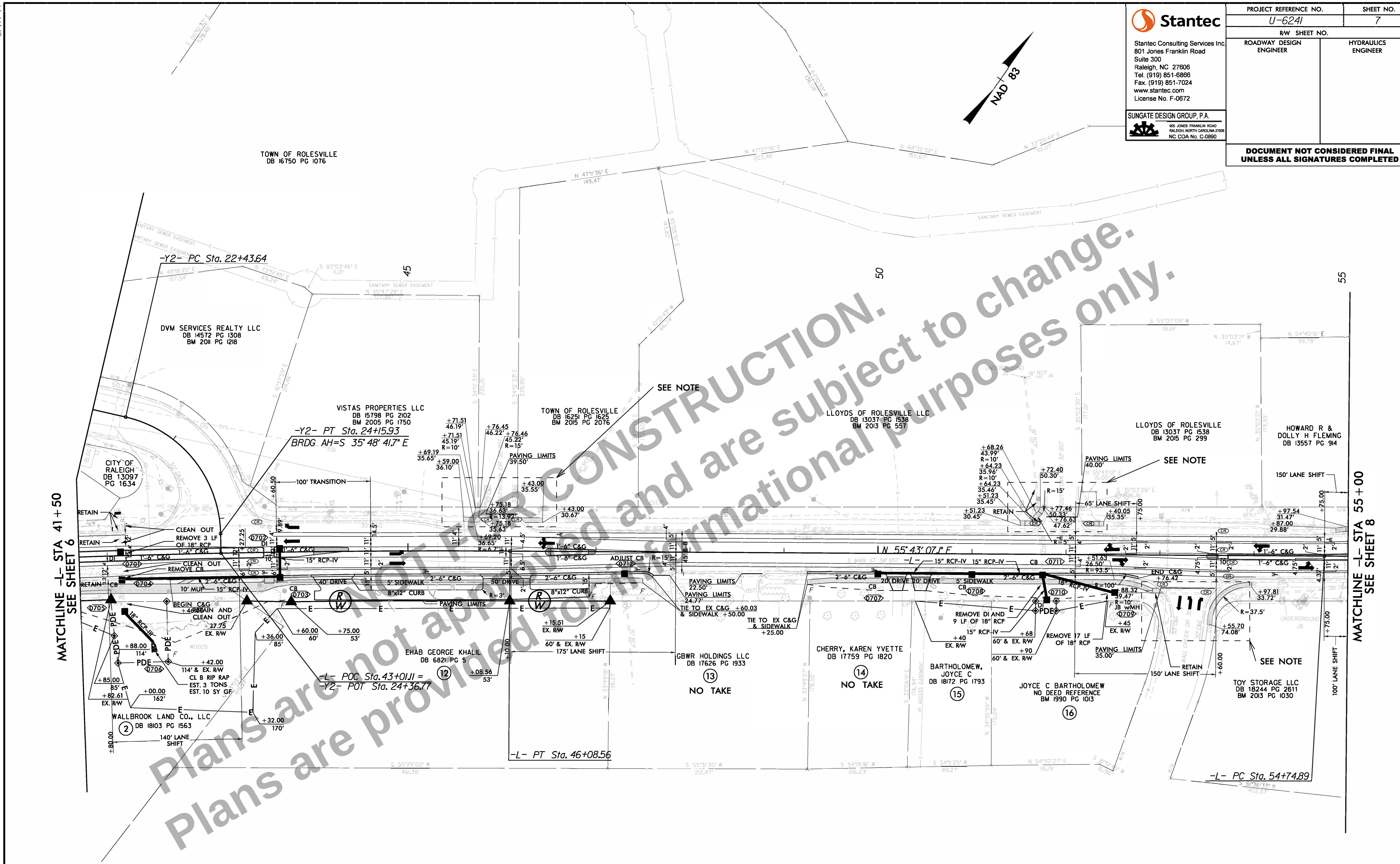
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Stantec

Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NAD 83
TOWN OF ROLESVILLE
DB 16750 PG 1076
DVM SERVICES REALTY LLC
DB 14572 PG 1308
BM 2011 PG 1218
-Y2- PC Sta. 22+43.64
VISTAS PROPERTIES LLC
DB 15798 PG 2102
BM 2005 PG 1750
-Y2- PT Sta. 24+15.93
BRDG AH=S 35° 48' 41.7" E
TOWN OF ROLESVILLE
DB 16251 PG 1625
BM 2015 PG 2076
SEE NOTE
LLOYDS OF ROLESVILLE LLC
DB 13037 PG 1538
BM 2013 PG 557
LLOYDS OF ROLESVILLE
DB 13037 PG 1538
BM 2015 PG 299
HOWARD R & DOLLY H FLEMING
DB 13557 PG 914
CITY OF RALEIGH
DB 13097
PG 1634
MATCHLINE -L- STA 41+50 SEE SHEET 6
MATCHLINE -L- STA 55+00 SEE SHEET 8
100' TRANSITION
PAVING LIMITS
L N 55° 43' 07.1" E
EHAB GEORGE KHALIL
DB 6821 PG 5
-L- POC Sta. 43+01.11 = -Y2- POT Sta. 24+36.77
-L- PT Sta. 46+08.56
WALLBROOK LAND CO., LLC
DB 18103 PG 1563
GBWR HOLDINGS LLC
DB 17626 PG 1933
NO TAKE
CHERRY, KAREN YVETTE
DB 17759 PG 1820
NO TAKE
BARTHOLOMEW, JOYCE C
DB 18172 PG 1793
JOYCE C BARTHOLOMEW
NO DEED REFERENCE
BM 1990 PG 1013
TOY STORAGE LLC
DB 18244 PG 2611
BM 2013 PG 1030
-L- PC Sta. 54+74.89
150' LANE SHIFT
45
50
55

-L-	
PI Sta 43+74.02	PI Sta 55+41.73
Δ = 2° 20' 06.0" (RT)	Δ = 0° 38' 18.0" (RT)
D = 0° 29' 51.7"	D = 0° 28' 38.9"
L = 469.15'	L = 133.69'
T = 234.61'	T = 66.85'
R = 11,512.00'	R = 12,000.00'
SE = SEE PLANS	SE = SEE PLANS

-Y2-
PI Sta 23+45.09
Δ = 75° 56' 14.6" (RT)
D = 44° 04' 25.2"
L = 172.30'
T = 101.45'
R = 130.00'
SE = SEE PLANS

NOTED CURB RAMP IMPROVEMENTS ON THIS SHEET ARE SUBJECT TO FEDERAL REIMBURSEMENT UNDER WBS 49183.3.2

NOTE: FOR -L- PROFILE SEE SHEET 15 & 16

8/17/99

9/20/2021
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PROJECT REFERENCE NO.	SHEET NO.
U-6241	8

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

Stantec

Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
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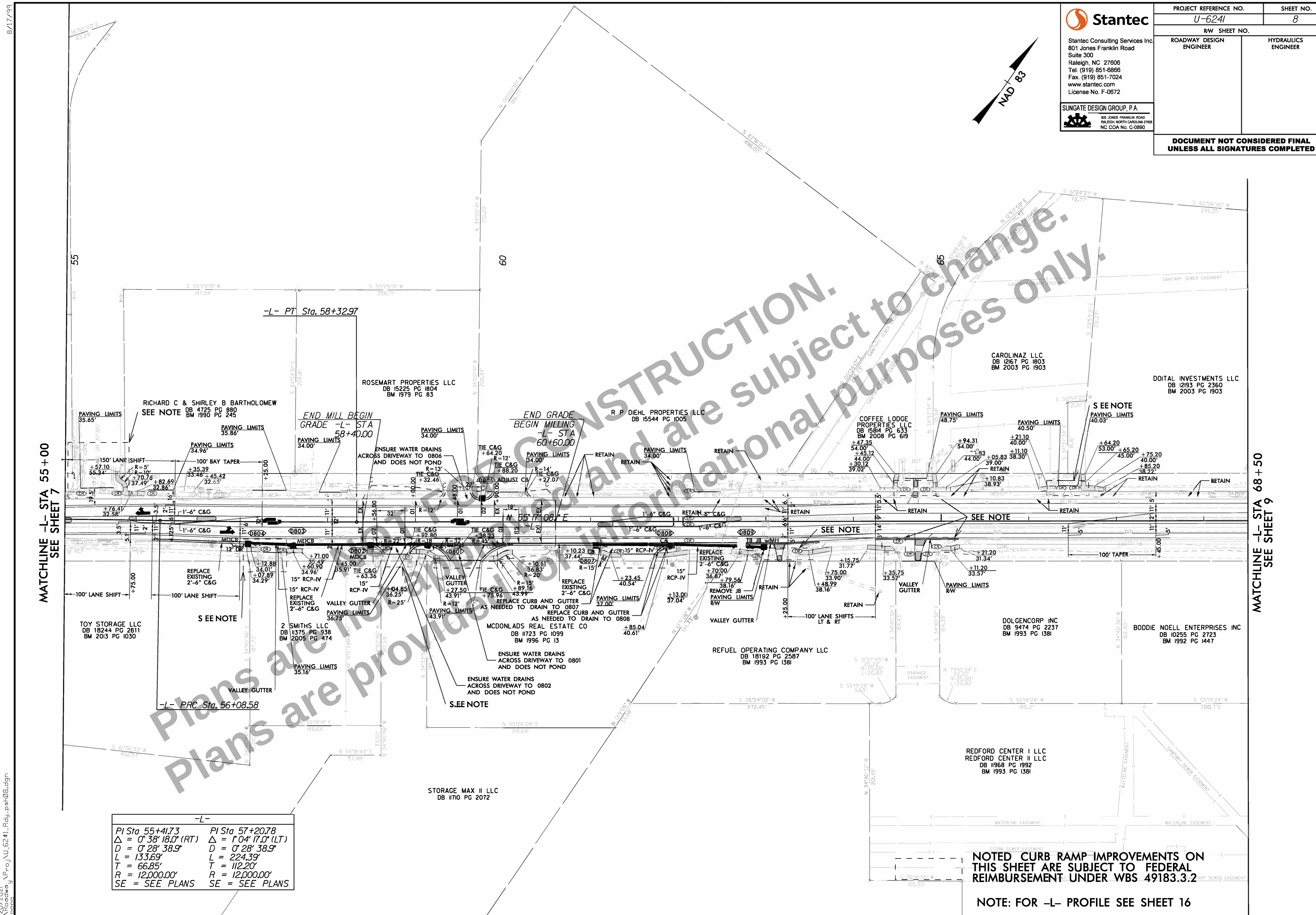
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NAD 83
MATCHLINE -L- STA 55+00 SEE SHEET 7
MATCHLINE -L- STA 68+50 SEE SHEET 9
-L- PT Sta. 58+32.97
-L- PRC Sta. 56+08.58
END MILL BEGIN GRADE -L- STA 58+40.00
END GRADE BEGIN MILLING -L- STA 60+60.00
N 55°17'08" E
ROSEMART PROPERTIES LLC
DB 15225 PG 1804
BM 1979 PG 83
RICHARD C & SHIRLEY B BARTHOLOMEW
SEE NOTE
DB 4725 PG 880
BM 1990 PG 245
R P DIEHL PROPERTIES LLC
DB 15544 PG 1005
CAROLINAZ LLC
DB 12167 PG 1803
BM 2003 PG 1903
DOITAL INVESTMENTS LLC
DB 12193 PG 2360
BM 2003 PG 1903
COFFEE LODGE PROPERTIES LLC
DB 15814 PG 633
BM 2008 PG 619
TOY STORAGE LLC
DB 18244 PG 2611
BM 2013 PG 1030
2 SMITHS LLC
DB 11375 PG 938
BM 2005 PG 474
MCDONLADS REAL ESTATE CO
DB 11723 PG 1099
BM 1996 PG 13
REFUEL OPERATING COMPANY LLC
DB 18192 PG 2587
BM 1993 PG 1381
DOLGENCORP INC
DB 9474 PG 2237
BM 1993 PG 1381
BODDIE NOELL ENTERPRISES INC
DB 10255 PG 2723
BM 1992 PG 1447
REDFORD CENTER I LLC
REDFORD CENTER II LLC
DB 11968 PG 1992
BM 1993 PG 1381
STORAGE MAX II LLC
DB 11710 PG 2072
ENSURE WATER DRAINS ACROSS DRIVEWAY TO 0806 AND DOES NOT POND
ENSURE WATER DRAINS ACROSS DRIVEWAY TO 0801 AND DOES NOT POND
ENSURE WATER DRAINS ACROSS DRIVEWAY TO 0802 AND DOES NOT POND
REPLACE CURB AND GUTTER AS NEEDED TO DRAIN TO 0807
REPLACE CURB AND GUTTER AS NEEDED TO DRAIN TO 0808
REPLACE EXISTING 2'-6" C&G
VALLEY GUTTER
PAVING LIMITS
RETAIN
SEE NOTE
100' LANE SHIFT
100' BAY TAPER
150' LANE SHIFT
100' TAPER
100' LANE SHIFTS LT & RT
1'-6" C&G
REMOVE JB
ADJUST CB
15" RCP-IV
SANITARY SEWER EASEMENT
WATERLINE EASEMENT
STORM SEWER EASEMENT
DRAINAGE EASEMENT
Plans are not for construction and are subject to change.
Plans are provided for informational purposes only.

-L-	
PI Sta 55+41.73	PI Sta 57+20.78
Δ = 0° 38' 18.0" (RT)	Δ = 1° 04' 17.0" (LT)
D = 0° 28' 38.9"	D = 0° 28' 38.9"
L = 133.69'	L = 224.39'
T = 66.85'	T = 112.20'
R = 12,000.00'	R = 12,000.00'
SE = SEE PLANS	SE = SEE PLANS

NOTED CURB RAMP IMPROVEMENTS ON THIS SHEET ARE SUBJECT TO FEDERAL REIMBURSEMENT UNDER WBS 49183.3.2

NOTE: FOR -L- PROFILE SEE SHEET 16

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	R/W SHEET NO.	
SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 NC COA No. C-0890	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

MATCHLINE –L– STA 68+50
SEE SHEET 8

MATCHLINE –L– STA 82+00
SEE SHEET 10

LEN PROPERTIES LLC
DB 16927 PG 2699

ROLESVILLE, LLC
DB 16870 PG 545
BM 2007 PG 143

SPIRIT MASTER FUNDING VII LLC
DB 15550 PG 841
BM 2007 PG 143

ROLESVILLE, LLC
DB 16780 PG 545
BM 2007 PG 143

DAPHNE B WILLOUGHBY
DB 15897 PG 2580
BM 2004 PG 1391

BERTIE W WIGGINS
DB 2278 PG 38

REDFORD 101 LLC
DB 17755 PG 1491
BM 1992 PG 41

WAKE COUNTY BOARD OF EDUCATION
NO DEED REFERENCE
BM 2003 PG 557

EDDINS FAMILY LLC
DB 17186 PG 434

BREWER REAL ESTATE HOLDINGS LLC
DB 13085 PG 1846

DUPLEX 209 LLC
DB 15172 PG 1630
BM 1928 PG 108

–L– PC Sta. 76+15.41

–L– PT Sta. 77+67.02

–L– PC Sta. 80+15.85

PAVING LIMITS 48.50'

SEE NOTE

PAVING LIMITS 32.00'

PAVING LIMITS 29.00'

PAVING LIMITS 52.80'

PAVING LIMITS 32.00'

REMOVE EX. CONC ISLAND

FLUME W/STEEL PLATE

SEE NOTE

200' LANE SHIFTS LT & RT

75' BAY TAPER

N 55°17'08" E –L–

N 54°33'42" E –L–

R=40'

R=28'

U-6241 MAIN ST US 401 BUS	11470 ROGERS 18795 ROAD
6751 11063	2916 4779
17274 28305	–L– 13754 22538
2136 3500	2452 4017
YR 2021 YR 2041	6391 REDFORD 10472 PLACE DR

–L–	
PI Sta 76+91.21	PI Sta 88+87.52
Δ = 0° 43' 26.0" (LT)	Δ = 9° 29' 28.2" (LT)
D = 0° 28' 38.9"	D = 0° 32' 44.4"
L = 151.61'	L = 1,739.35'
T = 75.81'	T = 871.67'
R = 12,000.00'	R = 10,500.00'
SE = SEE PLANS	SE = SEE PLANS

NOTED CURB RAMP IMPROVEMENTS ON THIS SHEET ARE SUBJECT TO FEDERAL REIMBURSEMENT UNDER WBS 49183.3.2

☆ UPGRADE EXISTING SIGNAL

NOTE: FOR –L– PROFILE SEE SHEET 16 & 17

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	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

MATCHLINE –L– STA 82+00
SEE SHEET 9

BERTIE W WIGGINS
DB 2074 PG 400

BERTIE W WIGGINS
DB 2278 PG 38
200' LANE SHIFTS
LT & RT

BERTIE W WIGGINS
NO DEED REFERENCE

TOWN OF ROLESVILLE
DB 9754 PG 1416

DONALD W AUTERI
NO DEED REFERENCE

MARK R & MARY K POWERS
DB 9384 PG 2517

SEE NOTE

OMAR N & SUSIE E EL-KAISSI
DB 17075 PG 258
BM 1928 PG 108

COLUMBUS F EAGLES III & PAMELA S EAGLES
DB 5389 PG 639

EDWARD W SCARBORO JR & SPENCER P SCARBORO
NO DEED REFERENCE

THOMAS A & RUTH E DUNN
DB 17160 PG 1624

SPENCER PULLEY, HEIRS
DB 112 PG 65

STEPHANIE & ROBERT SUGGS
DB 16741 PG 773
BM 2000 PG 2246

WILLIS V COOKE
NANCY S COOKE
DB 1810 PG 563

END MILLING
BEGIN GRADE
–L– STA 91+25.00

160' TRANSITION
150' TAPER

(17) COBBLESTONE CROSSING OF ROLESVILLE, LLC
DB 18457 PG 2507
BM 2007 PG 2414

(18) ANGELA S WELLS
DB 5317 PG 189
BM 1928 PG108

(19) BESSIE W DIXON
DB 2265 PG 087

(20) BERTIE W WIGGINS
DB 2265 PG 405

(21) KET REAL ESTATE LLC
DB 15925 PG 965

(43)

MATCHLINE –L– STA 94+00
SEE SHEET 11

–L–
PI Sta 88+87.52
Δ = 9° 29' 28.2" (LT)
D = 0° 32' 44.4"
L = 1,739.35'
T = 871.67'
R = 10,500.00'
SE = SEE PLANS

NOTED CURB RAMP IMPROVEMENTS ON THIS SHEET ARE SUBJECT TO FEDERAL REIMBURSEMENT UNDER WBS 49183.3.2

NOTE: FOR –L– PROFILE SEE SHEET 17

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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
U-6241	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

-Y3- POT Sta. 20+35.24

END CONSTRUCTION
-Y3- POT Sta. 18+50.00

-Y3- PT Sta. 17+83.28

-Y3- PCC Sta. 16+66.15

-L- POT Sta. 107+10.86

END TIP PROJECT U-6241
-L- STA 101+35.00

MATCHLINE -L- STA 94+00
SEE SHEET 10

END CONSTRUCTION
-L- STA 104+75.00

BEGIN CONSTRUCTION
-Y3- POT Sta. 11+40.00

-Y3- POT Sta. 10+00.00

-L- POC Sta. 97+03.35 =
-Y3- POC Sta. 15+00.17
-Y3- PC Sta. 14+38.53

-L- PT Sta. 97+55.20

DO NOT DISTURB MAPLE TREE

BUILDING & SEPTIC TO BE REMOVED BY OTHERS

DO NOT DISTURB BUILDING OR AWNING

DO NOT DISTURB BUILDING

TRENCH DRAIN SEE LANDSCAPING PLANS FOR DETAILS

CL B RIP RAP EST. 3 TONS EST. 10 SY GF

☆ UPGRADE EXISTING SIGNAL

-L-
PI Sta 88+87.52
Δ = 9° 29' 28.2" (LT)
D = 0° 32' 44.4"
L = 1,739.35'
T = 871.67'
R = 10,500.00'
SE = SEE PLANS

-Y3-	
PI Sta 15+54.83	PI Sta 17+24.72
Δ = 28° 58' 52.1" (RT)	Δ = 2° 44' 21.3" (RT)
D = 12° 43' 56.6"	D = 2° 20' 19.0"
L = 227.62'	L = 117.13'
T = 116.30'	T = 58.58'
R = 450.00'	R = 2,450.00'
SE = SEE PLANS	SE = SEE PLANS

NOTE:
FOR -L- PROFILE SEE SHEET 17
FOR -Y3- PROFILE SEE SHEET 19
FOR DIMENSIONS SEE SHEET 2B-4

NUM	PROPERTY OWNER	DEED BOOK	PAGE
21	KET REAL ESTATE LLC	DB 15925	PG 965
22	DRAGONFLY INVESTMENTS NC LLC	DB 17752	PG 806
23	EDDINS FAMILY LLC	DB 9971	PG 2251
24	COBBLESTONE CROSSING OF ROLESVILLE LLC	DB 18457 BM 1958	PG 2507 PG 95
25	PRIVETTE PROPERTIES LLC	DB 12763 BM 1981	PG 2560 PG 506
26	COBBLESTONE CROSSING OF ROLESVILLE LLC	DB 18457	PG 2507
27	COBBLESTONE CROSSING OF ROLESVILLE LLC	DB 18457 BM 1999	PG 2507 PG 252
28	COBBLESTONE CROSSING OF ROLESVILLE LLC	DB 18457	PG 2507
29	COBBLESTONE CROSSING OF ROLESVILLE LLC	DB 18457	PG 2507
30	LINDA ESTELLE MERRITT, ROXEY M WILKINS	DB 16423 BM 1964	PG 2434 PG 148

NUM	PROPERTY OWNER	DEED BOOK	PAGE
31	ROXEY M & WESLEY C WILKINS	DB 16593 BM 2009 DB 13684 BM 2009	PG 1043 PG 928 PG 719 PG 928
32	ELIZABETH & FRED J. WILLIAMS III	N/A	N/A
33	SUSIE H. WILLIAMS	DB 12976	PG 1157
34	TOWN OF ROLESVILLE	DB 14567 DB 2228	PG 741 PG 240
35	EDDINS FAMILY LLC	DB 9971 BM 2016	PG 2251 PG 660
36	EDDINS FAMILY LLC	DB 9971 BM 2016 DB 17835	PG 2251 PG 660 PG 2092
37	WENDY LEIGH BANNER	DB 15275	PG 1362
38	DRCW INVESTMENTS LLC	DB 15530	PG 1231
39	ROLESVILLE RURAL FIRE DEPT INC	DB 6469 BM 1995	PG 282 PG 404
40	ALICE FAULKNER COOK	DB 4134	PG 583

9/20/2021
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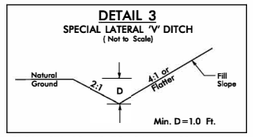
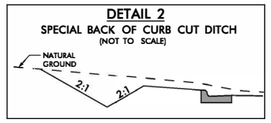
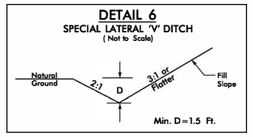


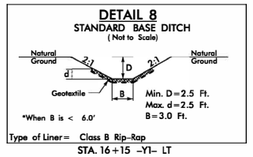
FROM STA. 23+50 TO STA. 25+00 –Y1– LT



FROM STA. 10+50 TO STA. 12+50 –Y2– RT



FROM STA. 21+50 TO STA. 24+50 –Y1– RT



STA. 16+15 –Y1– LT

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
U-6241	12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83

END GRADE, BEGIN MILL & FILL
–Y2– POT Sta. 16+60.00

MATCHLINE –Y2– STA 17+00 SEE SHEET 6

BEGIN CONSTRUCTION
–Y1– STA 25+00.00

(11) CAPITAL COMPANIES GROUP LLC
DB 16742 PG 2382
–Y2– PT Sta. 16+53.65
BRDG AH=S 86° 38' 08.0" E

(10) JASON DAVIS
JULIA DAVIS
DB 18302 PG 878
BM 2017 PG 2255

(8) WILLARD PARKS,
BARBARA FREEMAN PARKS
DB 1781 PG 10

(9) BERTIE WALL WIGGINS & BESSIE WAKE DIXON
DB 11256 PG 2438

(5) WALLBROOK LAND CO., LLC
DB 17801 PG 1550

(7) BROTHERS FORTY SIX LLC
DB 1325 PG PG 2343
BM 2008 PG 1281

–Y1– PC Sta. 25+40.73
–Y1– PT Sta. 26+32.04
–Y1– PT Sta. 23+99.38
–Y1– PC Sta. 20+19.10
–Y1– PT Sta. 18+83.32
–Y2– PC Sta. 11+00.00
–Y2– PRC Sta. 12+70.69
–Y1– POC Sta. 16+79.14 = –Y2– POT Sta. 10+00.00
BRDG AH = N 62° 57' 27.1" E

MATCHLINE –Y1– STA 15+50 SEE SHEET 6

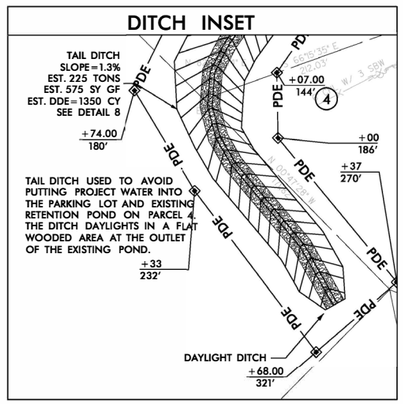
MATCHLINE SEE DITCH INSET

–Y1–		
PI Sta 16+89.75	PI Sta 22+17.74	PI Sta 25+86.41
△ = 43° 53' 56.0" (RT)	△ = 40° 52' 43.3" (LT)	△ = 5° 13' 54.0" (LT)
D = 10° 44' 58.8"	D = 10° 44' 58.8"	D = 5° 43' 46.5"
L = 408.37'	L = 380.28'	L = 91.31'
T = 214.80'	T = 198.64'	T = 45.69'
R = 533.00'	R = 533.00'	R = 1,000.00'
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS

–Y2–	
PI Sta 11+86.66	PI Sta 14+78.28
△ = 24° 26' 57.0" (LT)	△ = 54° 51' 21.9" (RT)
D = 14° 19' 26.2"	D = 14° 19' 26.2"
L = 170.69'	L = 382.97'
T = 86.66'	T = 207.59'
R = 400.00'	R = 400.00'
SE = SEE PLANS	SE = SEE PLANS

SYSTEM 1222 SIZED FOR ANTICIPATED FUTURE IMPERVIOUS AREA. CALCS AND PREPOST DO NOT ACCOUNT FOR FUTURE DETENTION THAT WOULD BE REQUIRED FOR DEVELOPMENT.

DITCH INSET



NOTE:
FOR –Y1– PROFILE SEE SHEET 18
FOR –Y2– PROFILE SEE SHEET 19

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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
U-6241	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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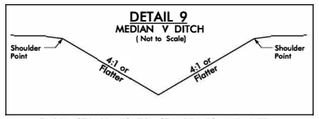
NAD 83

20

25

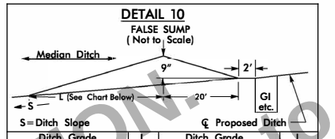
30

DETAIL 9
MEDIAN V DITCH
(Not to Scale)



FROM STA. 21+70 TO STA. 25+50 -Y7- MED

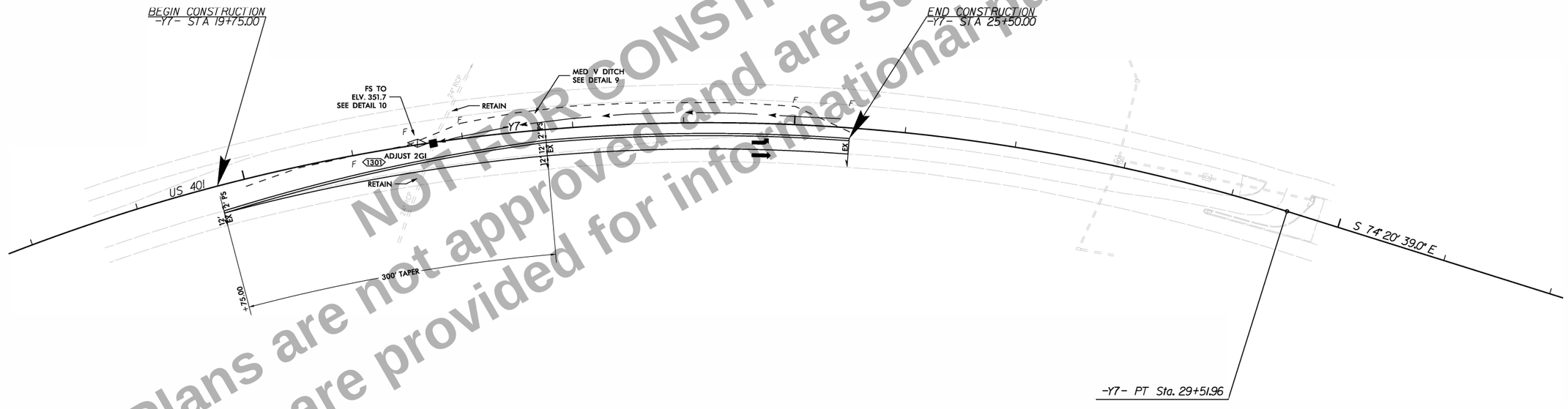
DETAIL 10
FALSE SUMP
(Not to Scale)



S = Ditch Slope ℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 21+70 -Y7- MED



-Y7-
PI Sta 23+34.65
△ = 42° 38' 33.8" (RT)
D = 3° 17' 06.4"
L = 1,298.06'
T = 680.75'
R = 1,744.10'
SE = SEE PLANS

U-6241
MAIN ST
US 401 BUS

16404 / 26880 US 401 BUS

-L-

15142 / 24812

1262 / 2068

32493 / 53243

18613 / 30499

US 401 BYPASS
-Y7-

YR 2021
YR 2041

ALL WORK ON THIS SHEET IS ASSOCIATED WITH WALLBROOK DEVELOPMENT AND IS NOT SUBJECT TO FEDERAL REIMBURSEMENT.

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APPENDIX F

CAPACITY ANALYSIS CALCULATIONS

MAIN STREET

&

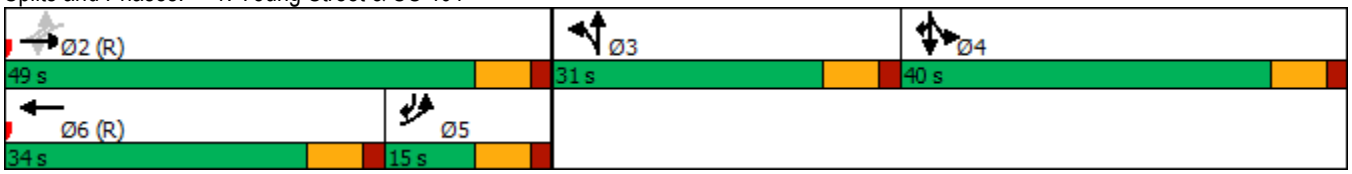
YOUNG STREET

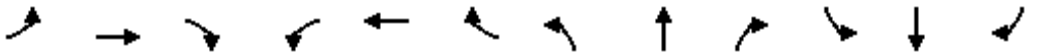
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	117	120	5	203	16	205	176	7	10	304	246
Future Volume (vph)	151	117	120	5	203	16	205	176	7	10	304	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			0%			-1%	
Storage Length (ft)	400		0	350		0	100		0	0		250
Storage Lanes	1		0	1		0	1		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		0.924			0.989			0.994				0.850
Flt Protected	0.950			0.950			0.950				0.998	
Satd. Flow (prot)	1778	1730	0	1761	1833	0	1770	1852	0	0	1868	1591
Flt Permitted	0.500			0.527			0.950				0.998	
Satd. Flow (perm)	936	1730	0	977	1833	0	1770	1852	0	0	1868	1591
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2380			764			3307			1203	
Travel Time (s)		46.4			14.9			64.4			23.4	
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)	168	130	133	6	226	18	228	196	8	11	338	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	263	0	6	244	0	228	204	0	0	349	273
Turn Type	pm+pt	NA		D.Pm	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6		3	3		4	4	4 5
Permitted Phases	2			2								
Detector Phase	5	2		2	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	15.0	49.0		49.0	34.0		31.0	31.0		40.0	40.0	
Total Split (%)	12.5%	40.8%		40.8%	28.3%		25.8%	25.8%		33.3%	33.3%	
Maximum Green (s)	8.0	42.0		42.0	27.0		24.0	24.0		33.0	33.0	
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		-2.0	-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag	Lag				Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	53.8	53.8		53.8	38.8		21.9	21.9			29.3	39.3
Actuated g/C Ratio	0.45	0.45		0.45	0.32		0.18	0.18			0.24	0.33
v/c Ratio	0.34	0.34		0.01	0.41		0.71	0.61			0.77	0.52
Control Delay	27.9	25.4		23.4	37.0		58.0	52.4			53.2	21.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	27.9	25.4		23.4	37.0		58.0	52.4			53.2	21.6
LOS	C	C		C	D		E	D			D	C
Approach Delay		26.4			36.7			55.3			39.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			E			D	
Queue Length 50th (ft)	80	133		3	151		166	146			249	94
Queue Length 95th (ft)	146	227		12	253		246	219			340	125
Internal Link Dist (ft)		2300			684			3227			1123	
Turn Bay Length (ft)	400			350			100					250
Base Capacity (vph)	489	775		438	592		383	401			544	596
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	0.34	0.34		0.01	0.41		0.60	0.51			0.64	0.46

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 39.7		Intersection LOS: D	
Intersection Capacity Utilization 66.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Young Street & US 401



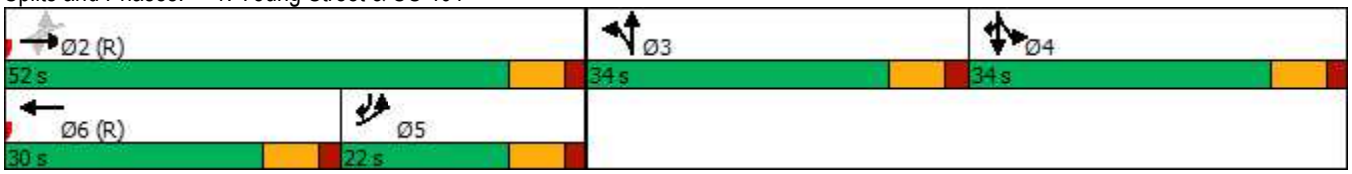


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	250	180	9	152	27	132	250	9	19	238	218
Future Volume (vph)	262	250	180	9	152	27	132	250	9	19	238	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			0%			-1%	
Storage Length (ft)	400		0	350		0	100		0	0		250
Storage Lanes	1		0	1		0	1		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		0.937			0.977			0.995				0.850
Flt Protected	0.950			0.950			0.950				0.996	
Satd. Flow (prot)	1778	1754	0	1761	1811	0	1770	1853	0	0	1865	1591
Flt Permitted	0.537			0.327			0.950				0.996	
Satd. Flow (perm)	1005	1754	0	606	1811	0	1770	1853	0	0	1865	1591
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2380			764			3307			1203	
Travel Time (s)		46.4			14.9			64.4			23.4	
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)	291	278	200	10	169	30	147	278	10	21	264	242
Shared Lane Traffic (%)												
Lane Group Flow (vph)	291	478	0	10	199	0	147	288	0	0	285	242
Turn Type	pm+pt	NA		D.Pm	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6		3	3		4	4	4 5
Permitted Phases	2			2								
Detector Phase	5	2		2	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	22.0	52.0		52.0	30.0		34.0	34.0		34.0	34.0	
Total Split (%)	18.3%	43.3%		43.3%	25.0%		28.3%	28.3%		28.3%	28.3%	
Maximum Green (s)	15.0	45.0		45.0	23.0		27.0	27.0		27.0	27.0	
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		-2.0	-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag	Lag				Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	55.3	55.3		55.3	33.3		24.9	24.9			24.8	41.8
Actuated g/C Ratio	0.46	0.46		0.46	0.28		0.21	0.21			0.21	0.35
v/c Ratio	0.51	0.59		0.04	0.40		0.40	0.75			0.74	0.44
Control Delay	31.2	29.9		22.6	40.8		43.6	56.9			56.2	17.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	31.2	29.9		22.6	40.8		43.6	56.9			56.2	17.6
LOS	C	C		C	D		D	E			E	B
Approach Delay		30.4			39.9			52.4			38.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	146	275		4	128		98	209			207	71
Queue Length 95th (ft)	241	433		17	216		156	298			294	101
Internal Link Dist (ft)		2300			684			3227			1123	
Turn Bay Length (ft)	400			350			100					250
Base Capacity (vph)	572	808		279	502		427	447			451	610
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	0.51	0.59		0.04	0.40		0.34	0.64			0.63	0.40

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 17 (14%), Referenced to phase 2:EBWB and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 38.5		Intersection LOS: D	
Intersection Capacity Utilization 76.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Young Street & US 401



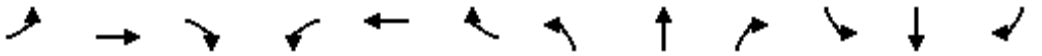
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	168	149	16	246	19	244	375	14	12	446	285
Future Volume (vph)	175	168	149	16	246	19	244	375	14	12	446	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			0%			-1%	
Storage Length (ft)	400		0	350		0	100		0	0		250
Storage Lanes	1		0	1		0	1		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		0.929			0.989			0.994				0.850
Flt Protected	0.950			0.950			0.950				0.999	
Satd. Flow (prot)	1778	1739	0	1761	1833	0	1770	1852	0	0	1870	1591
Flt Permitted	0.323			0.345			0.950				0.999	
Satd. Flow (perm)	605	1739	0	639	1833	0	1770	1852	0	0	1870	1591
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2380			764			3307			1203	
Travel Time (s)		46.4			14.9			64.4			23.4	
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)	194	187	166	18	273	21	271	417	16	13	496	317
Shared Lane Traffic (%)												
Lane Group Flow (vph)	194	353	0	18	294	0	271	433	0	0	509	317
Turn Type	pm+pt	NA		D.Pm	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6		3	3		4	4	4 5
Permitted Phases	2			2								
Detector Phase	5	2		2	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	43.0		43.0	29.0		36.0	36.0		41.0	41.0	
Total Split (%)	11.7%	35.8%		35.8%	24.2%		30.0%	30.0%		34.2%	34.2%	
Maximum Green (s)	7.0	36.0		36.0	22.0		29.0	29.0		34.0	34.0	
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		-2.0	-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag	Lag				Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	39.3	39.3		39.3	25.3		30.4	30.4			35.2	44.2
Actuated g/C Ratio	0.33	0.33		0.33	0.21		0.25	0.25			0.29	0.37
v/c Ratio	0.68	0.62		0.09	0.76		0.60	0.92			0.93	0.54
Control Delay	53.5	40.3		30.4	59.0		45.9	70.2			65.6	20.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	53.5	40.3		30.4	59.0		45.9	70.2			65.6	20.6
LOS	D	D		C	E		D	E			E	C
Approach Delay		45.0			57.4			60.8			48.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			E			E			D	
Queue Length 50th (ft)	115	234		10	219		184	326			379	96
Queue Length 95th (ft)	#187	340		29	#354		276	#514			#581	176
Internal Link Dist (ft)		2300			684			3227			1123	
Turn Bay Length (ft)	400			350			100					250
Base Capacity (vph)	286	569		209	386		457	478			561	596
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	0.68	0.62		0.09	0.76		0.59	0.91			0.91	0.53

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 5 (4%), Referenced to phase 2:EBWB and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 52.4		Intersection LOS: D	
Intersection Capacity Utilization 87.7%		ICU Level of Service E	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Young Street & US 401



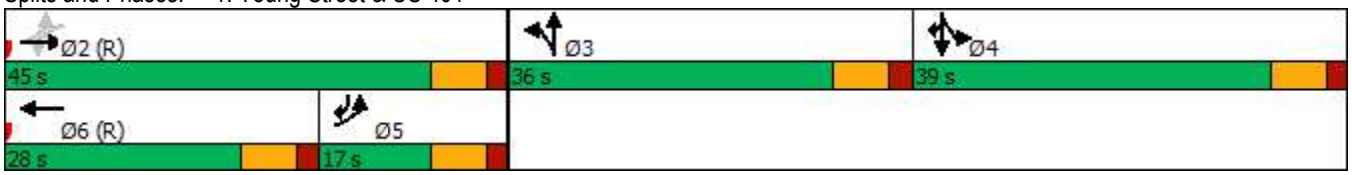
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	304	312	217	18	210	31	164	430	21	22	464	253
Future Volume (vph)	304	312	217	18	210	31	164	430	21	22	464	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			0%			-1%	
Storage Length (ft)	400		0	350		0	100		0	0		250
Storage Lanes	1		0	1		0	1		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		0.939			0.981			0.993				0.850
Flt Protected	0.950			0.950			0.950				0.998	
Satd. Flow (prot)	1778	1758	0	1761	1818	0	1770	1850	0	0	1868	1591
Flt Permitted	0.342			0.100			0.950				0.998	
Satd. Flow (perm)	640	1758	0	185	1818	0	1770	1850	0	0	1868	1591
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2380			764			3307			1203	
Travel Time (s)		46.4			14.9			64.4			23.4	
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)	338	347	241	20	233	34	182	478	23	24	516	281
Shared Lane Traffic (%)												
Lane Group Flow (vph)	338	588	0	20	267	0	182	501	0	0	540	281
Turn Type	pm+pt	NA		D.Pm	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6		3	3		4	4	4 5
Permitted Phases	2			2								
Detector Phase	5	2		2	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	17.0	45.0		45.0	28.0		36.0	36.0		39.0	39.0	
Total Split (%)	14.2%	37.5%		37.5%	23.3%		30.0%	30.0%		32.5%	32.5%	
Maximum Green (s)	10.0	38.0		38.0	21.0		29.0	29.0		32.0	32.0	
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		-2.0	-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag	Lag				Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	40.0	40.0		40.0	23.0		31.0	31.0			34.0	46.0
Actuated g/C Ratio	0.33	0.33		0.33	0.19		0.26	0.26			0.28	0.38
v/c Ratio	1.03	1.00		0.33	0.77		0.40	1.05			1.02	0.46
Control Delay	102.9	78.4		47.4	61.6		40.0	98.4			87.3	16.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	102.9	78.4		47.4	61.6		40.0	98.4			87.3	16.8
LOS	F	E		D	E		D	F			F	B
Approach Delay		87.4			60.6			82.8			63.2	

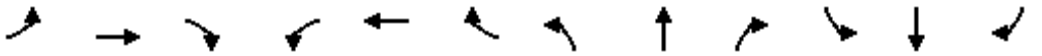
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			F			E	
Queue Length 50th (ft)	~225	~457		12	198		117	~422			~444	83
Queue Length 95th (ft)	#445	#696		39	#320		187	#635			#660	125
Internal Link Dist (ft)		2300			684			3227			1123	
Turn Bay Length (ft)	400			350			100					250
Base Capacity (vph)	327	586		61	348		457	477			529	609
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	1.03	1.00		0.33	0.77		0.40	1.05			1.02	0.46

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 76.1 Intersection LOS: E
Intersection Capacity Utilization 104.2% ICU Level of Service G
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: 1: Young Street & US 401





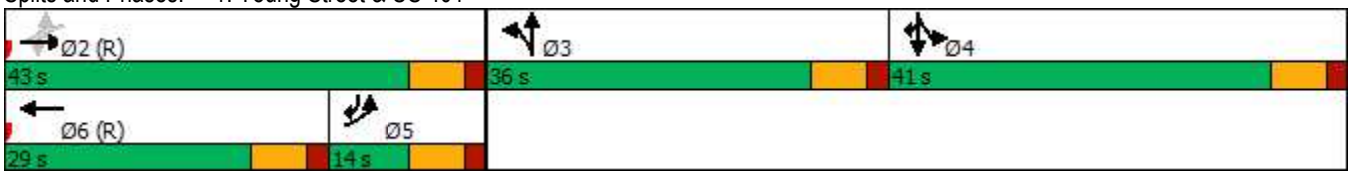
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	171	149	19	253	19	244	376	15	12	449	290
Future Volume (vph)	177	171	149	19	253	19	244	376	15	12	449	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			0%			-1%	
Storage Length (ft)	400		0	350		0	100		0	0		250
Storage Lanes	1		0	1		0	1		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		0.930			0.990			0.994				0.850
Flt Protected	0.950			0.950			0.950				0.999	
Satd. Flow (prot)	1778	1741	0	1761	1835	0	1770	1852	0	0	1870	1591
Flt Permitted	0.307			0.340			0.950				0.999	
Satd. Flow (perm)	575	1741	0	630	1835	0	1770	1852	0	0	1870	1591
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2380			764			3307			1203	
Travel Time (s)		46.4			14.9			64.4			23.4	
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)	197	190	166	21	281	21	271	418	17	13	499	322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	356	0	21	302	0	271	435	0	0	512	322
Turn Type	pm+pt	NA		D.Pm	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6		3	3		4	4	4 5
Permitted Phases	2			2								
Detector Phase	5	2		2	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	43.0		43.0	29.0		36.0	36.0		41.0	41.0	
Total Split (%)	11.7%	35.8%		35.8%	24.2%		30.0%	30.0%		34.2%	34.2%	
Maximum Green (s)	7.0	36.0		36.0	22.0		29.0	29.0		34.0	34.0	
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		-2.0	-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag	Lag				Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	39.2	39.2		39.2	25.2		30.5	30.5			35.3	44.3
Actuated g/C Ratio	0.33	0.33		0.33	0.21		0.25	0.25			0.29	0.37
v/c Ratio	0.71	0.63		0.10	0.78		0.60	0.93			0.93	0.55
Control Delay	56.2	40.5		30.8	60.7		45.8	70.7			66.4	20.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	56.2	40.5		30.8	60.7		45.8	70.7			66.4	20.9
LOS	E	D		C	E		D	E			E	C
Approach Delay		46.1			58.7			61.1			48.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			E			E			D	
Queue Length 50th (ft)	117	236		12	226		184	328			382	98
Queue Length 95th (ft)	#201	343		32	#370		276	#519			#586	182
Internal Link Dist (ft)		2300			684			3227			1123	
Turn Bay Length (ft)	400			350			100					250
Base Capacity (vph)	278	569		206	386		457	478			561	596
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	0.71	0.63		0.10	0.78		0.59	0.91			0.91	0.54

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 5 (4%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 53.1 Intersection LOS: D
Intersection Capacity Utilization 88.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Young Street & US 401



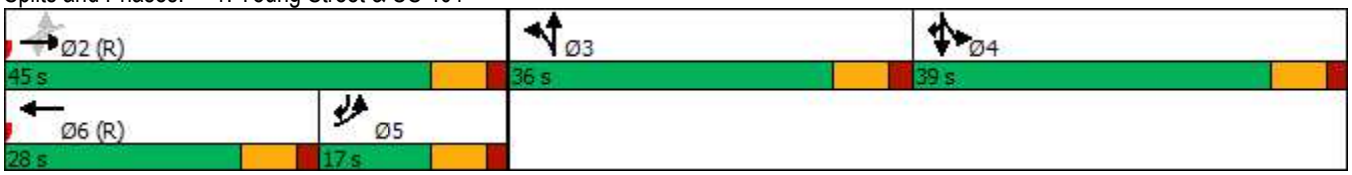
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	308	318	217	20	214	31	164	432	23	22	466	256
Future Volume (vph)	308	318	217	20	214	31	164	432	23	22	466	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			0%			-1%	
Storage Length (ft)	400		0	350		0	100		0	0		250
Storage Lanes	1		0	1		0	1		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		0.939			0.981			0.992				0.850
Flt Protected	0.950			0.950			0.950				0.998	
Satd. Flow (prot)	1778	1758	0	1761	1818	0	1770	1848	0	0	1868	1591
Flt Permitted	0.333			0.100			0.950				0.998	
Satd. Flow (perm)	623	1758	0	185	1818	0	1770	1848	0	0	1868	1591
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		2380			764			3307			1203	
Travel Time (s)		46.4			14.9			64.4			23.4	
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)	342	353	241	22	238	34	182	480	26	24	518	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	342	594	0	22	272	0	182	506	0	0	542	284
Turn Type	pm+pt	NA		D.Pm	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6		3	3		4	4	4 5
Permitted Phases	2			2								
Detector Phase	5	2		2	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	17.0	45.0		45.0	28.0		36.0	36.0		39.0	39.0	
Total Split (%)	14.2%	37.5%		37.5%	23.3%		30.0%	30.0%		32.5%	32.5%	
Maximum Green (s)	10.0	38.0		38.0	21.0		29.0	29.0		32.0	32.0	
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		-2.0	-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Lead/Lag	Lag				Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	40.0	40.0		40.0	23.0		31.0	31.0			34.0	46.0
Actuated g/C Ratio	0.33	0.33		0.33	0.19		0.26	0.26			0.28	0.38
v/c Ratio	1.06	1.01		0.36	0.78		0.40	1.06			1.02	0.47
Control Delay	110.0	80.8		50.1	62.8		40.0	101.3			88.2	16.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	110.0	80.8		50.1	62.8		40.0	101.3			88.2	16.9
LOS	F	F		D	E		D	F			F	B
Approach Delay		91.5			61.8			85.1			63.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			F			E	
Queue Length 50th (ft)	~236	~471		13	202		117	~431			~447	84
Queue Length 95th (ft)	#458	#709		43	#330		187	#644			#665	127
Internal Link Dist (ft)		2300			684			3227			1123	
Turn Bay Length (ft)	400			350			100					250
Base Capacity (vph)	323	586		61	348		457	477			529	609
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	1.06	1.01		0.36	0.78		0.40	1.06			1.02	0.47

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 78.3 Intersection LOS: E
Intersection Capacity Utilization 104.9% ICU Level of Service G
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: 1: Young Street & US 401



APPENDIX G

CAPACITY ANALYSIS CALCULATIONS

YOUNG STREET

&

WILLIAMS STREET

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	126	4	4	218	4	4
Future Vol, veh/h	126	4	4	218	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	140	4	4	242	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	144	0	392	142
Stage 1	-	-	-	-	142	-
Stage 2	-	-	-	-	250	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1438	-	612	906
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	792	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1438	-	610	906
Mov Cap-2 Maneuver	-	-	-	-	656	-
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	761	-	-	1438	-
HCM Lane V/C Ratio	0.012	-	-	0.003	-
HCM Control Delay (s)	9.8	-	-	7.5	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	269	4	4	168	4	4
Future Vol, veh/h	269	4	4	168	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	299	4	4	187	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	303	0	496	301
Stage 1	-	-	-	-	301	-
Stage 2	-	-	-	-	195	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1258	-	533	739
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	838	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1258	-	531	739
Mov Cap-2 Maneuver	-	-	-	-	601	-
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	835	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	663	-	-	1258	-
HCM Lane V/C Ratio	0.013	-	-	0.004	-
HCM Control Delay (s)	10.5	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	184	4	4	274	4	4
Future Vol, veh/h	184	4	4	274	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	204	4	4	304	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	208	0	518	206
Stage 1	-	-	-	-	206	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1363	-	518	835
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1363	-	516	835
Mov Cap-2 Maneuver	-	-	-	-	590	-
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	740	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	691	-	-	1363	-
HCM Lane V/C Ratio	0.013	-	-	0.003	-
HCM Control Delay (s)	10.3	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	345	4	5	237	4	5
Future Vol, veh/h	345	4	5	237	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	383	4	6	263	4	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	387	0	660	385
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	275	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1171	-	428	663
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1171	-	426	663
Mov Cap-2 Maneuver	-	-	-	-	524	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	767	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	593	-	-	1171	-
HCM Lane V/C Ratio	0.017	-	-	0.005	-
HCM Control Delay (s)	11.2	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	188	4	4	284	4	4
Future Vol, veh/h	188	4	4	284	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	209	4	4	316	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	213	0	535	211
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	324	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1357	-	506	829
Stage 1	-	-	-	-	824	-
Stage 2	-	-	-	-	733	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1357	-	504	829
Mov Cap-2 Maneuver	-	-	-	-	581	-
Stage 1	-	-	-	-	824	-
Stage 2	-	-	-	-	731	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	683	-	-	1357	-
HCM Lane V/C Ratio	0.013	-	-	0.003	-
HCM Control Delay (s)	10.3	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	353	4	5	243	4	5
Future Vol, veh/h	353	4	5	243	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	392	4	6	270	4	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	396	0	676	394
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	282	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1163	-	419	655
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	766	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1163	-	417	655
Mov Cap-2 Maneuver	-	-	-	-	517	-
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	762	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	586	-	-	1163	-
HCM Lane V/C Ratio	0.017	-	-	0.005	-
HCM Control Delay (s)	11.3	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

APPENDIX H

CAPACITY ANALYSIS CALCULATIONS

YOUNG STREET

&

GRANITE FALLS BOULEVARD

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	94	4	12	16	4	4	14	306	11	4	538	135
Future Vol, veh/h	94	4	12	16	4	4	14	306	11	4	538	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	-	-	-	-	200	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	104	4	13	18	4	4	16	340	12	4	598	150

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1063	1065	673	1068	1134	346	748	0	0	352	0	0
Stage 1	681	681	-	378	378	-	-	-	-	-	-	-
Stage 2	382	384	-	690	756	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	201	223	455	199	203	697	861	-	-	1207	-	-
Stage 1	440	450	-	644	615	-	-	-	-	-	-	-
Stage 2	640	611	-	435	416	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	193	218	455	187	199	697	861	-	-	1207	-	-
Mov Cap-2 Maneuver	193	218	-	187	199	-	-	-	-	-	-	-
Stage 1	432	449	-	632	603	-	-	-	-	-	-	-
Stage 2	620	599	-	417	415	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.6	24.1	0.4	0
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	861	-	-	193	358	215	1207	-	-
HCM Lane V/C Ratio	0.018	-	-	0.541	0.05	0.124	0.004	-	-
HCM Control Delay (s)	9.3	-	-	43.7	15.6	24.1	8	-	-
HCM Lane LOS	A	-	-	E	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.8	0.2	0.4	0	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	90	4	17	11	4	4	22	500	12	4	439	79
Future Vol, veh/h	90	4	17	11	4	4	22	500	12	4	439	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	-	-	-	-	200	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	100	4	19	12	4	4	24	556	13	4	488	88

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1155	1157	532	1163	1195	563	576	0	0	569	0	0
Stage 1	540	540	-	611	611	-	-	-	-	-	-	-
Stage 2	615	617	-	552	584	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	174	196	547	172	186	526	997	-	-	1003	-	-
Stage 1	526	521	-	481	484	-	-	-	-	-	-	-
Stage 2	479	481	-	518	498	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	166	191	547	160	181	526	997	-	-	1003	-	-
Mov Cap-2 Maneuver	166	191	-	160	181	-	-	-	-	-	-	-
Stage 1	513	519	-	469	472	-	-	-	-	-	-	-
Stage 2	459	469	-	494	496	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	47.3	25.9	0.4	0.1
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	997	-	-	166	404	193	1003	-	-
HCM Lane V/C Ratio	0.025	-	-	0.602	0.058	0.109	0.004	-	-
HCM Control Delay (s)	8.7	-	-	55	14.5	25.9	8.6	-	-
HCM Lane LOS	A	-	-	F	B	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.3	0.2	0.4	0	-	-

Intersection	
Int Delay, s/veh	21.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	4	14	19	4	4	16	526	13	4	718	157
Future Vol, veh/h	109	4	14	19	4	4	16	526	13	4	718	157
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	-	-	-	-	200	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	121	4	16	21	4	4	18	584	14	4	798	174

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1524	1527	885	1530	1607	591	972	0	0	598	0	0
Stage 1	893	893	-	627	627	-	-	-	-	-	-	-
Stage 2	631	634	-	903	980	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 97	117	344	96	105	507	709	-	-	979	-	-
Stage 1	336	360	-	471	476	-	-	-	-	-	-	-
Stage 2	469	473	-	332	328	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 91	114	344	87	102	507	709	-	-	979	-	-
Mov Cap-2 Maneuver	~ 91	114	-	87	102	-	-	-	-	-	-	-
Stage 1	328	359	-	459	464	-	-	-	-	-	-	-
Stage 2	449	461	-	312	327	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	251.9	54.4	0.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	709	-	-	91	238	102	979	-	-
HCM Lane V/C Ratio	0.025	-	-	1.331	0.084	0.294	0.005	-	-
HCM Control Delay (s)	10.2	-	-	290	21.5	54.4	8.7	-	-
HCM Lane LOS	B	-	-	F	C	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	8.9	0.3	1.1	0	-	-

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

Intersection	
Int Delay, s/veh	31.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	5	20	13	4	4	26	720	14	4	697	92
Future Vol, veh/h	104	5	20	13	4	4	26	720	14	4	697	92
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	-	-	-	-	200	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	116	6	22	14	4	4	29	800	16	4	774	102

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1703	1707	825	1713	1750	808	876	0	0	816	0	0
Stage 1	833	833	-	866	866	-	-	-	-	-	-	-
Stage 2	870	874	-	847	884	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 72	91	372	71	86	381	771	-	-	812	-	-
Stage 1	363	384	-	348	370	-	-	-	-	-	-	-
Stage 2	346	367	-	357	363	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 66	87	372	61	82	381	771	-	-	812	-	-
Mov Cap-2 Maneuver	~ 66	87	-	61	82	-	-	-	-	-	-	-
Stage 1	349	382	-	335	356	-	-	-	-	-	-	-
Stage 2	325	353	-	329	361	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s$	404.3	70.9	0.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	771	-	-	66	225	77	812	-	-
HCM Lane V/C Ratio	0.037	-	-	1.751	0.123	0.303	0.005	-	-
HCM Control Delay (s)	9.9	-	-	-$ 495.9	23.2	70.9	9.5	-	-
HCM Lane LOS	A	-	-	F	C	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	10.4	0.4	1.1	0	-	-

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

Intersection	
Int Delay, s/veh	22

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	4	14	19	4	4	16	531	13	4	720	157
Future Vol, veh/h	109	4	14	19	4	4	16	531	13	4	720	157
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	-	-	-	-	200	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	121	4	16	21	4	4	18	590	14	4	800	174

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1532	1535	887	1538	1615	597	974	0	0	604	0	0
Stage 1	895	895	-	633	633	-	-	-	-	-	-	-
Stage 2	637	640	-	905	982	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 95	116	343	94	104	503	708	-	-	974	-	-
Stage 1	335	359	-	468	473	-	-	-	-	-	-	-
Stage 2	465	470	-	331	327	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 89	113	343	85	101	503	708	-	-	974	-	-
Mov Cap-2 Maneuver	~ 89	113	-	85	101	-	-	-	-	-	-	-
Stage 1	327	358	-	456	461	-	-	-	-	-	-	-
Stage 2	445	458	-	311	326	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	263.7	55.7	0.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	708	-	-	89	236	100	974	-	-
HCM Lane V/C Ratio	0.025	-	-	1.361	0.085	0.3	0.005	-	-
HCM Control Delay (s)	10.2	-	-	$ 303.7	21.7	55.7	8.7	-	-
HCM Lane LOS	B	-	-	F	C	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	9	0.3	1.1	0	-	-

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

Intersection	
Int Delay, s/veh	32.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	5	20	13	4	4	26	723	14	4	701	92
Future Vol, veh/h	104	5	20	13	4	4	26	723	14	4	701	92
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	-	-	-	-	200	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	116	6	22	14	4	4	29	803	16	4	779	102

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1711	1715	830	1721	1758	811	881	0	0	819	0	0
Stage 1	838	838	-	869	869	-	-	-	-	-	-	-
Stage 2	873	877	-	852	889	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 71	90	370	70	85	379	767	-	-	810	-	-
Stage 1	361	382	-	347	369	-	-	-	-	-	-	-
Stage 2	345	366	-	354	361	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 65	86	370	61	81	379	767	-	-	810	-	-
Mov Cap-2 Maneuver	~ 65	86	-	61	81	-	-	-	-	-	-	-
Stage 1	347	380	-	334	355	-	-	-	-	-	-	-
Stage 2	324	352	-	326	359	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 415	70.9	0.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	767	-	-	65	223	77	810	-	-
HCM Lane V/C Ratio	0.038	-	-	1.778	0.125	0.303	0.005	-	-
HCM Control Delay (s)	9.9	-	-	-$ 509.1	23.4	70.9	9.5	-	-
HCM Lane LOS	A	-	-	F	C	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	10.5	0.4	1.1	0	-	-

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

APPENDIX I

CAPACITY ANALYSIS CALCULATIONS

YOUNG STREET

&

SCARBORO STREET/SITE ACCESS A

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	10	331	556	6
Future Vol, veh/h	4	4	10	331	556	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	11	368	618	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1012	622	625	0	-	0
Stage 1	622	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	265	487	956	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	262	487	956	-	-	-
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	684	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	956	-	432	-	-
HCM Lane V/C Ratio	0.012	-	0.021	-	-
HCM Control Delay (s)	8.8	-	13.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	7	4	523	464	4
Future Vol, veh/h	4	7	4	523	464	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	8	4	581	516	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1107	518	520	0	-	0
Stage 1	518	-	-	-	-	-
Stage 2	589	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	233	558	1046	-	-	-
Stage 1	598	-	-	-	-	-
Stage 2	554	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	232	558	1046	-	-	-
Mov Cap-2 Maneuver	368	-	-	-	-	-
Stage 1	596	-	-	-	-	-
Stage 2	554	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1046	-	470	-	-
HCM Lane V/C Ratio	0.004	-	0.026	-	-
HCM Control Delay (s)	8.5	-	12.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	12	555	739	7
Future Vol, veh/h	4	4	12	555	739	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	13	617	821	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1468	825	829	0	-	0
Stage 1	825	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	141	372	803	-	-	-
Stage 1	430	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	139	372	803	-	-	-
Mov Cap-2 Maneuver	276	-	-	-	-	-
Stage 1	423	-	-	-	-	-
Stage 2	523	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.7	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	803	-	317	-	-
HCM Lane V/C Ratio	0.017	-	0.028	-	-
HCM Control Delay (s)	9.6	-	16.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	8	5	746	726	4
Future Vol, veh/h	4	8	5	746	726	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	9	6	829	807	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1650	809	811	0	-	0
Stage 1	809	-	-	-	-	-
Stage 2	841	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	109	380	815	-	-	-
Stage 1	438	-	-	-	-	-
Stage 2	423	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	108	380	815	-	-	-
Mov Cap-2 Maneuver	245	-	-	-	-	-
Stage 1	435	-	-	-	-	-
Stage 2	423	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.7	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	815	-	321	-	-
HCM Lane V/C Ratio	0.007	-	0.042	-	-
HCM Control Delay (s)	9.4	-	16.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	4	4	8	4	5	12	555	4	4	739	7
Future Vol, veh/h	4	4	4	8	4	5	12	555	4	4	739	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	4	4	9	4	6	13	617	4	4	821	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1483	1480	825	1482	1482	619	829	0	0	621	0	0
Stage 1	833	833	-	645	645	-	-	-	-	-	-	-
Stage 2	650	647	-	837	837	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	103	125	372	103	125	489	803	-	-	960	-	-
Stage 1	363	384	-	461	467	-	-	-	-	-	-	-
Stage 2	458	467	-	361	382	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	98	123	372	97	123	489	803	-	-	960	-	-
Mov Cap-2 Maneuver	98	123	-	97	123	-	-	-	-	-	-	-
Stage 1	357	382	-	454	460	-	-	-	-	-	-	-
Stage 2	441	460	-	351	380	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.7	35.7	0.2	0
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	803	-	-	143	136	960	-	-
HCM Lane V/C Ratio	0.017	-	-	0.093	0.139	0.005	-	-
HCM Control Delay (s)	9.6	-	-	32.7	35.7	8.8	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.5	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	4	8	5	4	4	5	746	6	4	726	4
Future Vol, veh/h	4	4	8	5	4	4	5	746	6	4	726	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	4	9	6	4	4	6	829	7	4	807	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1666	1665	809	1669	1664	833	811	0	0	836	0	0
Stage 1	817	817	-	845	845	-	-	-	-	-	-	-
Stage 2	849	848	-	824	819	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	77	97	380	76	97	369	815	-	-	798	-	-
Stage 1	370	390	-	357	379	-	-	-	-	-	-	-
Stage 2	356	378	-	367	389	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	73	96	380	71	96	369	815	-	-	798	-	-
Mov Cap-2 Maneuver	73	96	-	71	96	-	-	-	-	-	-	-
Stage 1	367	388	-	355	376	-	-	-	-	-	-	-
Stage 2	345	375	-	353	387	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.4	44.2	0.1	0.1
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	815	-	-	136	106	798	-	-
HCM Lane V/C Ratio	0.007	-	-	0.131	0.136	0.006	-	-
HCM Control Delay (s)	9.4	-	-	35.4	44.2	9.5	-	-
HCM Lane LOS	A	-	-	E	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.5	0	-	-

APPENDIX J

CAPACITY ANALYSIS CALCULATIONS

MAIN STREET

&

SITE ACCESS B

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	186	276	4	4	10
Future Vol, veh/h	4	186	276	4	4	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	207	307	4	4	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	311	0	-	0	524	309
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	215	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1249	-	-	-	514	731
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1249	-	-	-	512	731
Mov Cap-2 Maneuver	-	-	-	-	512	-
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	821	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1249	-	-	-	651
HCM Lane V/C Ratio	0.004	-	-	-	0.024
HCM Control Delay (s)	7.9	-	-	-	10.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	349	241	4	4	6
Future Vol, veh/h	8	349	241	4	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	388	268	4	4	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	272	0	-	0	676	270
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	406	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1291	-	-	-	419	769
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	673	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1291	-	-	-	416	769
Mov Cap-2 Maneuver	-	-	-	-	416	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	673	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1291	-	-	-	574
HCM Lane V/C Ratio	0.007	-	-	-	0.019
HCM Control Delay (s)	7.8	-	-	-	11.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX K

SIMTRAFFIC QUEUEING REPORTS

Intersection: 1: Young Street & US 401

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	123	183	17	217	200	2715	1124	350
Average Queue (ft)	56	84	2	94	192	1688	961	310
95th Queue (ft)	112	158	10	178	226	2944	1403	465
Link Distance (ft)		2338		663		3266	1110	
Upstream Blk Time (%)						1	31	
Queuing Penalty (veh)						0	176	
Storage Bay Dist (ft)	400		350		100			250
Storage Blk Time (%)					79	71	78	4
Queuing Penalty (veh)					145	145	191	12

Intersection: 2: Williams Street & US 401

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	12	28
Average Queue (ft)	0	7
95th Queue (ft)	6	27
Link Distance (ft)		1342
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Young Street & Granite Falls Boulevard

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	LTR	L	L	TR
Maximum Queue (ft)	127	32	52	35	51	642
Average Queue (ft)	44	9	17	6	2	134
95th Queue (ft)	90	29	48	27	30	503
Link Distance (ft)		1492	1650			1310
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225			200	100	
Storage Blk Time (%)						17
Queuing Penalty (veh)						1

Intersection: 4: Young Street & Scarboro Street

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	53	30	509
Average Queue (ft)	11	3	257
95th Queue (ft)	46	18	622
Link Distance (ft)	1702		493
Upstream Blk Time (%)			13
Queuing Penalty (veh)			76
Storage Bay Dist (ft)		25	
Storage Blk Time (%)		1	
Queuing Penalty (veh)		4	

Network Summary

Network wide Queuing Penalty: 750

Intersection: 1: Young Street & US 401

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	205	271	25	171	200	3302	628	350
Average Queue (ft)	102	149	3	80	148	2256	320	192
95th Queue (ft)	183	241	14	144	267	3647	572	380
Link Distance (ft)		2338		663		3266	1110	
Upstream Blk Time (%)						21		
Queuing Penalty (veh)						0		
Storage Bay Dist (ft)	400		350		100			250
Storage Blk Time (%)					24	91	30	1
Queuing Penalty (veh)					63	120	65	3

Intersection: 2: Williams Street & US 401

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	30	28
Average Queue (ft)	1	7
95th Queue (ft)	11	26
Link Distance (ft)		1342
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Young Street & Granite Falls Boulevard

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	LTR	L	L	TR
Maximum Queue (ft)	90	34	48	43	16	4
Average Queue (ft)	37	10	16	9	1	0
95th Queue (ft)	72	28	44	33	9	3
Link Distance (ft)		1492	1650			1310
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225			200	100	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Young Street & Scarboro Street

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	36	31
Average Queue (ft)	9	2
95th Queue (ft)	32	14
Link Distance (ft)	1702	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		25
Storage Blk Time (%)		0
Queuing Penalty (veh)		1

Network Summary

Network wide Queuing Penalty: 252

Intersection: 1: Young Street & US 401

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	329	353	118	377	200	994	726	350
Average Queue (ft)	178	201	12	215	183	594	366	188
95th Queue (ft)	328	310	75	343	240	973	702	415
Link Distance (ft)		2338		663		3266	1110	
Upstream Blk Time (%)							0	
Queuing Penalty (veh)							0	
Storage Bay Dist (ft)	400		350		100			250
Storage Blk Time (%)	1	0		2	34	65	26	
Queuing Penalty (veh)	2	0		0	134	158	75	

Intersection: 2: Williams Street & US 401

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	12	28
Average Queue (ft)	0	7
95th Queue (ft)	6	26
Link Distance (ft)		1342
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Young Street & Granite Falls Boulevard

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	LTR	L	L	TR
Maximum Queue (ft)	189	42	69	43	21	18
Average Queue (ft)	77	11	22	10	2	1
95th Queue (ft)	161	31	55	34	13	10
Link Distance (ft)		1492	1650			1310
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225			200	100	
Storage Blk Time (%)	1					
Queuing Penalty (veh)	0					

Intersection: 4: Young Street & Scarboro Street

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	31	36	6
Average Queue (ft)	8	6	0
95th Queue (ft)	29	27	4
Link Distance (ft)	1702		493
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		25	
Storage Blk Time (%)		1	
Queuing Penalty (veh)		5	

Network Summary

Network wide Queuing Penalty: 375

Intersection: 1: Young Street & US 401

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	500	2305	39	290	200	2321	929	350
Average Queue (ft)	494	1818	8	176	159	1501	588	268
95th Queue (ft)	540	2693	27	269	254	2748	973	484
Link Distance (ft)		2338		663		3266	1110	
Upstream Blk Time (%)		28				5		
Queuing Penalty (veh)		0				0		
Storage Bay Dist (ft)	400		350		100			250
Storage Blk Time (%)	52	50			16	73	54	
Queuing Penalty (veh)	276	151			73	119	138	

Intersection: 2: Williams Street & US 401

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	30	28
Average Queue (ft)	2	6
95th Queue (ft)	13	26
Link Distance (ft)		1342
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Young Street & Granite Falls Boulevard

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	LTR	L	L	TR
Maximum Queue (ft)	183	46	60	67	17	26
Average Queue (ft)	68	12	23	14	1	1
95th Queue (ft)	138	33	55	47	9	11
Link Distance (ft)		1492	1650			1310
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225			200	100	
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 4: Young Street & Scarboro Street

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	52	30
Average Queue (ft)	12	3
95th Queue (ft)	39	18
Link Distance (ft)	1702	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		25
Storage Blk Time (%)		0
Queuing Penalty (veh)		2

Network Summary

Network wide Queuing Penalty: 760

Intersection: 1: Young Street & US 401

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	330	322	54	352	200	1128	756	350
Average Queue (ft)	164	202	11	204	184	667	419	193
95th Queue (ft)	283	295	36	316	238	1269	872	431
Link Distance (ft)		2338		663		3266	1104	
Upstream Blk Time (%)							2	
Queuing Penalty (veh)							13	
Storage Bay Dist (ft)	400		350		100			250
Storage Blk Time (%)	0			1	31	63	30	1
Queuing Penalty (veh)	0			0	120	153	88	3

Intersection: 2: Williams Street & US 401

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	12	28
Average Queue (ft)	1	7
95th Queue (ft)	8	27
Link Distance (ft)		1342
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	25	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: Young Street & Granite Falls Boulevard

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	LTR	L	L	TR
Maximum Queue (ft)	179	37	54	47	22	64
Average Queue (ft)	80	9	22	12	2	4
95th Queue (ft)	160	27	50	39	13	45
Link Distance (ft)		1492	1650			1310
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225			200	100	
Storage Blk Time (%)	1					0
Queuing Penalty (veh)	0					0

Intersection: 4: Young Street & Scarboro Street/Access A

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (ft)	40	44	36	21	98
Average Queue (ft)	11	14	4	1	21
95th Queue (ft)	36	43	22	8	148
Link Distance (ft)	1702	1510			479
Upstream Blk Time (%)					0
Queuing Penalty (veh)					1
Storage Bay Dist (ft)			25	25	
Storage Blk Time (%)			1	0	4
Queuing Penalty (veh)			4	3	0

Intersection: 5: US 401 & Access B

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	12	31
Average Queue (ft)	1	10
95th Queue (ft)	8	34
Link Distance (ft)		705
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	25	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Network Summary

Network wide Queuing Penalty: 385

Intersection: 1: Young Street & US 401

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	500	2362	129	358	200	1679	1057	350
Average Queue (ft)	494	1873	16	193	163	1042	780	294
95th Queue (ft)	548	2697	80	342	257	1705	1242	479
Link Distance (ft)		2338		663		3266	1104	
Upstream Blk Time (%)		35					5	
Queuing Penalty (veh)		0					36	
Storage Bay Dist (ft)	400		350		100			250
Storage Blk Time (%)	60	46		3	18	72	61	1
Queuing Penalty (veh)	324	141		1	81	119	155	3

Intersection: 2: Williams Street & US 401

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	25	28
Average Queue (ft)	1	6
95th Queue (ft)	11	25
Link Distance (ft)		1342
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	25	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: Young Street & Granite Falls Boulevard

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	LTR	L	L	TR
Maximum Queue (ft)	162	53	56	51	27	124
Average Queue (ft)	70	15	19	13	2	16
95th Queue (ft)	134	39	49	39	14	137
Link Distance (ft)		1492	1650			1310
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225			200	100	
Storage Blk Time (%)	0					2
Queuing Penalty (veh)	0					0

Intersection: 4: Young Street & Scarboro Street/Access A

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (ft)	48	37	29	39	242
Average Queue (ft)	16	10	2	3	58
95th Queue (ft)	44	32	15	28	284
Link Distance (ft)	1702	1475			488
Upstream Blk Time (%)					1
Queuing Penalty (veh)					7
Storage Bay Dist (ft)			25	25	
Storage Blk Time (%)			0	0	9
Queuing Penalty (veh)			3	2	0

Intersection: 5: US 401 & Access B

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	25	23
Average Queue (ft)	2	4
95th Queue (ft)	13	18
Link Distance (ft)		997
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	25	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	1	

Network Summary

Network wide Queuing Penalty: 873