

Chelsey Brooks

From: Lee, Tou Y <tylee@ncdot.gov>
Sent: Thursday, August 14, 2025 11:03 AM
To: Obregon, Felix A; Randy Goddard
Cc: Kevin Parker; Max Hsiang; Helms, Amelia C; Gardner, Zachary L; Michael Wickline; Chelsey Brooks
Subject: RE: [External] The Cottage Green TIA ~ Comment Response (resend)
Categories: Cottage Green

Good Morning Randy,

Department is OKAY with moving forward with finalizing the full TIA.

Thank you,

Tou Lee, PE
Division 10 Traffic Engineer
North Carolina Department of Transportation

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Albemarle, NC 28001



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From: Obregon, Felix A <faobregon@ncdot.gov>
Sent: Thursday, August 14, 2025 10:43 AM
To: Randy Goddard <randy@drgrp.com>; Lee, Tou Y <tylee@ncdot.gov>
Cc: Kevin Parker <kparker@stallingsnc.org>; Max Hsiang <mhsiang@stallingsnc.org>; Helms, Amelia C <achelms@ncdot.gov>; Gardner, Zachary L <zlgardner@ncdot.gov>; Michael Wickline <Michael@drgrp.com>; Chelsey Brooks <Chelsey@drgrp.com>
Subject: Re: [External] The Cottage Green TIA ~ Comment Response (resend)

Tou - Can you review and provide Department comments?

Thanks,

Felix A. Obregon, PE
Division 10 Engineer

NCDOT

Sent from my iPhone

On Aug 13, 2025, at 6:44 AM, Randy Goddard <randy@drgrp.com> wrote:

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Felix,

Good morning and resending the information originally provided on 8/6.

The updated LOS table for the intersection of Matthews Weddington Road & Tilley Morris Road is attached. The following assumptions were used for the analysis at this intersection:

1. Retail trip generation assuming the reduced 19,100 SF Strip Retail [LUC 822]
2. Commercial trip distribution with 10% to/from the west on Tilley Morris Road and 15% to/from the south on Weddington Matthews Road
3. Residential trip distribution with 15% to/from the west on Tilley Morris Road and 15% to/from the south on Weddington Matthews Road

The results indicate there are no changes in LOS and the increases in delay are all less than 25%, so it is therefore our opinion that no mitigation should be required at this intersection.

If acceptable, we would like to finalize the full TIA and get that submitted to you and Stallings to make sure we are **approved well in advance of the shifted decision date of 9/8 (would be nice to have by 8/29).**

Kevin has already e-mailed me and indicated he only is awaiting NCDOT's approval of the TIA (see last attachment).

Please let me know if you have any questions or need any additional information.

Appreciatively,

RANDY E. GODDARD > **PE** senior principal
P 704.343.0608 x313 M 704.654.9619

From: Obregon, Felix A <faobregon@ncdot.gov>

Sent: Friday, August 1, 2025 4:32 PM

To: Randy Goddard <randy@drgrp.com>; Kevin Parker <kparker@stallingsnc.org>; Chelsey Brooks <Chelsey@drgrp.com>; Max Hsiang <mhsiang@stallingsnc.org>; Helms, Amelia C <achelms@ncdot.gov>; Gardner, Zachary L <zlgardner@ncdot.gov>; Lee, Tou Y <tylee@ncdot.gov>

Cc: Michael Wickline <Michael@drgrp.com>

Subject: RE: [External] RE: The Cottage Green TIA ~ Comment Response

All:

NCDOT has reviewed the latest submittal. Our comment is the following:

1. Matthews Weddington Rd & Tilley Morris Rd (RAB):

1. Separate the distribution from the retail and residential to see how the roundabout be impacted
2. Redo analysis to show impacts for this intersection to know the impacts

Thanks,

Felix A. Obregon, PE

Division 10 Engineer

North Carolina Department of Transportation

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[Facebook](#) [Twitter](#) [YouTube](#)

From: Randy Goddard <randy@drgrp.com>

Sent: Wednesday, July 30, 2025 7:34 AM

To: Kevin Parker <kparker@stallingsnc.org>; Chelsey Brooks <Chelsey@drgrp.com>; Max Hsiang <mhsiang@stallingsnc.org>; Helms, Amelia C <achelms@ncdot.gov>; Gardner, Zachary L <zlgardner@ncdot.gov>; Lee, Tou Y <tylee@ncdot.gov>; Obregon, Felix A <faobregon@ncdot.gov>

Cc: Michael Wickline <Michael@drgrp.com>

Subject: [External] RE: The Cottage Green TIA ~ Comment Response

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Kevin,

Good morning and we are extremely motivated to finalize the TIA for this project so we can discuss at any time that is best for group.

Thank you,

RANDY E. GODDARD > PE senior principal

P 704.343.0608 x313 M 704.654.9619

From: Kevin Parker <kparker@stallingsnc.org>
Sent: Wednesday, July 30, 2025 7:29 AM
To: Chelsey Brooks <Chelsey@drgrp.com>; Max Hsiang <mhsiang@stallingsnc.org>; Helms, Amelia C <achelms@ncdot.gov>; Gardner, Zachary L <zlgardner@ncdot.gov>; Lee, Tou Y <tylee@ncdot.gov>; Obregon, Felix A <faobregon@ncdot.gov>
Cc: Randy Goddard <randy@drgrp.com>; Michael Wickline <Michael@drgrp.com>
Subject: Re: The Cottage Green TIA ~ Comment Response

Good morning, all.

A majority Stallings' comments have been addressed. I believe the main outstanding comment for us is associated with mitigation requirements at Union Day.

Happy to discuss further with everyone.

Regards,
Kevin Parker

Kevin Parker, P.E.

Engineering Director

704-821-0309

kparker@stallingsnc.org

www.stallingsnc.org

From: Chelsey Brooks <Chelsey@drgrp.com>
Sent: Monday, July 21, 2025 1:00 PM
To: Kevin Parker <kparker@stallingsnc.org>; Max Hsiang <mhsiang@stallingsnc.org>; Helms, Amelia C <achelms@ncdot.gov>; Gardner, Zachary L <zlgardner@ncdot.gov>; Lee, Tou Y <tylee@ncdot.gov>; Obregon, Felix A <faobregon@ncdot.gov>
Cc: Randy Goddard <randy@drgrp.com>; Michael Wickline <Michael@drgrp.com>
Subject: RE: The Cottage Green TIA ~ Comment Response

Good afternoon,

The Cottage Green TIA comment response is attached for your review.

Please let us know if there are any questions or if any additional information is needed.

Thanks,

Chelsey R. Brooks > PE
associate

1111 Hawthorne Lane, Charlotte, NC 28205
P 704.343.0608 x341

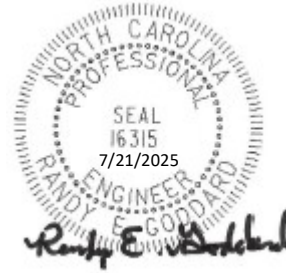
TIA COMMENT RESPONSE MEMORANDUM

Date: July 21, 2025

To: Kevin Parker, PE
Engineering Director
Town of Stallings

From: Randy E. Goddard, PE
Senior Principal
Design Resource Group, PA (C-2165)

Subject: **THE COTTAGE GREEN TIA (1134-001) – COMMENT RESPONSE**



The initial Cottage Green TIA was submitted on April 7, 2025. The Town of Stallings provided their comments on May 27, 2025 and NCDOT provided their comments on June 3, 2025. We offer the following responses in **red** to the comments provided to DRG (see original email correspondence of the comments attached at the end of this memo) as they pertain to the TIA prior to submitting the revised final TIA.

NCDOT COMMENTS:

An email response was provided for the June 3, 2025 NCDOT comments and is attached at the end of this memo.

- Matthews Weddington Rd/Chestnut Ln RAB
 - Mitigation is necessary at this roundabout.
 - NCDOT is willing to consider the following tested improvements at this intersection:
 - Construct a second southbound receiving lane on Matthews Weddington Road to terminate as a right turn lane at Access "A"
 - Modify the southbound approach channelizing median to allow a second circulating lane on the north side of the roundabout
 - Please provide concept.
 - **The developer has agreed to the following improvements at this RAB and a concept for the improvements is attached:**
 - **Construct a second southbound receiving lane on Matthews Weddington Road to terminate as a right turn lane at Access "A"/Antioch Church Road.**
 - **Modify the southbound approach channelizing median to allow a second circulating lane on the north side of the roundabout.**



- Restripe the southbound left to a shared thru/left with 250 feet of storage on Matthews Weddington Road.
 - Restripe the westbound approach to have a terminating left turn lane and a shared left/thru/right lane with 150 feet of storage on Chestnut Lane.
- Matthews Weddington Rd/Tilley Morris Rd RAB
 - Mitigation is necessary at this roundabout.
 - NCDOT is willing to review the potential of adding a second circulating lane and possibly a westbound receiving lane.
 - In our TIA, we did not suggest any improvements as only EB Tilley Morris dropped from a LOS “D” to LOS “E” in the PM peak. The overall intersection LOS remained LOS “F” in the AM and LOS “C” in the PM. In addition, the actual increase in overall intersection delay is only 4.5 seconds and the actual increase in the eastbound approach delay is only 11.6 seconds in the PM peak.
 - Additionally, please note that the site is now proposing a reduction in retail SF (from 32,700 SF to 19,100 SF) and the estimated trips based on this reduction are provided below.

Land Use [ITE Code]			Daily	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Proposed Development									
Single Family (Detached) [210]	21	DU	240	5	13	18	14	9	23
Single Family (Detached) [210]	47	DU	504	9	28	37	31	18	49
Single Family (Attached) [215]	70	DU	483	8	23	31	22	16	38
Multi Family (Low Rise) [220]	84	DU	614	12	37	49	36	21	57
Strip Retail Plaza [822]	19,100	SF	1,040	27	18	45	63	63	126
High-Turnover Sit-Down Restaurant [932]	10,900	SF	1,168	85	64	149	91	87	178
Subtotal Trips			4,049	146	183	329	257	214	471
Internal Capture Reductions (see attached)			*	-25	-25	-50	-56	-55	-111
Pass-By Reductions			-54	0	0	0	-31	-23	-54
Total New Trips			3,995	121	158	279	170	136	306

References:

Trip Generation, 11th Edition, Institute of Transportation Engineers, Washington, DC. 2021.

*Internal Capture not applied to daily trips.

Pass-By Reduction for LUC 932 = 43% in PM Peak



- The results are shown below for each analysis scenario:

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
2027 No Build Conditions (from TIA)						
Intersection	F	59.6	1.28	C	15.1	0.87
Eastbound - Tilley Morris Rd	B	11.2	-	D	26.2	-
Westbound - Matthews Weddington Rd	F	120.1	-	A	7.8	-
Northbound - Matthews Weddington Rd	C	15.9	-	B	11.0	-
Southbound - Union Day School	D	31.2	-	B	10.5	-
2027 Build Conditions (from TIA)						
Intersection	F	67.2	1.34	C	19.6	0.95
Eastbound - Tilley Morris Rd	B	12.8	-	E	37.8	-
Westbound - Matthews Weddington Rd	F	135.0	-	A	8.3	-
Northbound - Matthews Weddington Rd	C	17.1	-	B	12.8	-
Southbound - Union Day School	D	34.5	-	B	11.5	-
2027 Build Conditions (Reduced Trip Gen)						
Intersection	F	66.8	1.33	C	18.5	0.94
Eastbound - Tilley Morris Rd	B	12.6	-	E	35.1	-
Westbound - Matthews Weddington Rd	F	134.0	-	A	8.2	-
Northbound - Matthews Weddington Rd	C	17.0	-	B	12.4	-
Southbound - Union Day School	D	34.3	-	B	11.3	-
2027 Build with Improvements Conditions (TIA Trip Gen)						
Intersection	D	26.7	0.91	C	16.7	0.92
Eastbound - Tilley Morris Rd	B	11.9	-	D	31.6	-
Westbound - Matthews Weddington Rd	E	38.6	-	A	7.5	-
Northbound - Matthews Weddington Rd	C	17.1	-	B	12.8	-
Southbound - Union Day School	D	26.1	-	A	8.4	-
2027 Build with Improvements Conditions (Reduced Trip Gen)						
Intersection	D	26.5	0.91	C	15.9	0.90
Eastbound - Tilley Morris Rd	B	11.7	-	D	29.5	-
Westbound - Matthews Weddington Rd	E	38.2	-	A	7.4	-
Northbound - Matthews Weddington Rd	C	17.0	-	B	12.4	-
Southbound - Union Day School	D	25.9	-	A	8.3	-

- With the reduction, the overall intersection LOS remained LOS “F” in the AM and LOS “C” in the PM. In addition, the actual increase in overall intersection delay is only 3.4 seconds and the actual increase in the eastbound approach delay is only 8.9 seconds in the PM peak.
- The following improvements were tested and found to fully mitigate the intersection under either scenario:
 - Construct a second westbound receiving lane on Tilley Morris Road with full lane width and transition taper totaling 1,000 feet
 - Modify the eastbound approach channelizing median to allow a second circulating lane on the west side of the roundabout
 - Restripe the westbound left to a shared thru/left with 150 feet of storage on Matthews Weddington Road



- Construct a southbound right turn lane with 75 feet of storage on the Union Day School driveway
 - Restripe the existing southbound lanes to have a terminating left turn lane and a thru lane with 75 feet of storage on the Union Day School driveway
- These are significant improvements compared to the minor increase in delay resulting in the LOS drop for the one approach during the one peak hour. Therefore, we feel that these improvements should not be the developer's responsibility and that the significant improvements at the Chestnut RAB and the signalized intersection at Antioch Church Rd should be considered adequate and would offset the minor impacts to the Tilley Morris RAB.



TOWN OF STALLINGS/REVIEWER COMMENTS:

BUILD TRAFFIC CONDITIONS

Site Trip Generation

- Land use & densities differ from the scoping checklist and the TIA; however, it was noted that they differ in the TIA. The densities in the TIA do not match what is shown in the site plan (site plan shows 70 single-family detached and 68 single-family attached but opposite in the report) this could change the site trip calcs.
 - This was due to mislabeling on the site plan. This is corrected on the attached updated site plan, which also shows the reduced retail.**
- Was the NCHRP Internal Capture spreadsheet utilized and approved during scoping/ in the MOU, if applicable? Y / N / N/A
 - Internal Capture spreadsheet in the Appendix was the old one from the scoping checklist (old land use & densities). The Internal Capture spreadsheet calculating the updated trip gen from the TIA was **NOT** included in the Appendix.
 - The NCHRP Internal Capture spreadsheet is attached.**

Pass-By and Internal Capture (if applicable)

- Do entering and exiting pass-by trips adjusted to equal one another? Y / **N** / N/A
 - Noted. There is only a difference of 1 between the entering and exiting pass-by trips. Therefore, updated analysis should not be deemed necessary.**

SYNCHRO/SIDRA QAQC:

- Note that the Build 2032 Synchro file contained the improvements recommended at Int 2 from the 2027 BWI Synchro.
 - Noted. Build +5 analysis typically includes full build suggested improvements.**
- Node #1: (Synchro) RAB should not have 2 circulating lanes (maybe due to limitations in Synchro), could provide false SimTraffic queueing reports due to the 2 circulating lanes.
 - The RAB is coded with 2 circulating lanes to account for the thru and left lanes on the west side of the RAB. The HCM 6th settings are coded so that the circulating lanes match real world conditions. Additionally, results provided for the RAB are from SIDRA analysis with only the max queues being provided by SimTraffic.**

HCM 6th ROUNDABOUT	EB	WB	NB	SB
Entry Lanes	1	2	2	2
Conflicting Circle Lanes	2	1	1	2
Exit Lanes	1	1	1	1

- Node #3:

- Based on google earth, it looks like there is unmarked pavement that could be utilized as an EBR turn lane with approximately 50' of storage along Matthews Weddington Rd.

- **Although the pavement is there, it is not marked as a RTL. Therefore, it was not included to provide the most conservative analysis and updated analysis should not be deemed necessary.**



- Build/BWI (2025/2032) AM - northern leg "Access B" link should have a min of 1,000'
 - **The link distance in the AM files shows 967' and queue results show max queue of less than 400'. Therefore, updated analysis should not be deemed necessary.**
- BWI does not include the 100' westbound right-turn lane recommended in the TIA
 - **Noted. The RTL was added based on turn lane warrants rather than analysis results. The RTL has minimal impact on the analysis results. Therefore, updated analysis should not be deemed necessary.**

- Node #4:

- (Synchro) RAB should not have 2 circulating lanes (maybe due to limitations in Synchro), could provide false SimTraffic queueing reports due to the 2 circulating lanes.
 - **The RAB is coded with 2 circulating lanes to account for the thru and left lanes on the north side of the RAB. The HCM 6th settings are coded so that the circulating lanes match real world conditions. Additionally, results provided for the RAB are from SIDRA analysis with only the max queues being provided by SimTraffic.**

HCM 6th ROUNDABOUT	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	2	1	2
Exit Lanes	1	1	1	1

- (Synchro) northern leg "Union Day School" link should have a min of 1,000'
 - **The link distance in the files shows 835' and queue results show max queue of less than 250'. Therefore, updated analysis should not be deemed necessary.**



- Node #5: BWI does not include the 75' southbound right-turn lane recommended in the TIA
 - **Noted. The RTL was added based on turn lane warrants rather than analysis results. The RTL has minimal impact on the analysis results. Therefore, updated analysis should not be deemed necessary.**

Signal Plans and Timings

- Node #2 (existing):
 - NOTE only utilized min initial from the signal plan (all other timing settings were NCDOT recommended timing settings & mentioned in the report)
 - **Noted. Min initial is also NCDOT recommended timing settings.**
 - Should be min recall on phase 2 & 6 not max
 - **Noted. This does not change synchro results. Therefore, updated analysis should not be deemed necessary.**
 - Phase 1 should be the lagging phase
 - **Synchro is set to allow lead/lag optimization and removing this makes minimal difference in results. Therefore, updated analysis should not be deemed necessary.**
- Node #2 (build):
 - changed the WB phase from phase 4 (existing & no-build) to phase 8
 - **When adding the 4th leg to the intersection, the phasing is updated to match NEMA phasing and does not change results. Therefore, updated analysis should not be deemed necessary.**

Document Comments:

Page 21-24 – Matthews Weddington Rd & Chestnut Ln:

- WBR & SBL 95% & Max queues exceed storages under No-Build & Build/BWI
- Heavy queueing experienced at this intersection
 - **Developer is not responsible for mitigating queues exceeding storage that are present under no build conditions. There is no significant increase in queues between no build and build. Additionally, the queues are expected to be significantly reduced with the improvements the developer has agreed to at this RAB. Therefore, updated analysis should not be deemed necessary.**
- Did not provide flow-scale analysis reports for the roundabout in the Appendix, only screenshots in the report.
 - **Noted. The flow-scale analysis reports are attached.**



Page 25-27 – Matthews Weddington Rd & Antioch Church Rd/Access A:

- Table 8 – Even with the suggested improvements at this intersection, the increase in delay on the SB approach is 53% and the LOS degrades by one level (C to D) during the AM (based on the comparison of no-build and BWI).
 - Based on NCDOT and Stallings guidelines, there should be additional mitigation for dropping one level and the increase in delay greater than 25%

▪ **By manually adjusting the signal timings (see attached Synchro report) for the AM peak, the following results can be achieved:**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
2027 No Build Conditions (from TIA)						
Intersection	E	65.4	1.08	E	68.9	1.09
Westbound - Antioch Ch Rd	F	88.2	-	F	83.8	-
Northbound - Matthews Weddington Rd	E	77.9	-	F	83.0	-
Southbound - Matthews Weddington Rd	C	33.9	-	D	45.0	-
2027 Build Conditions (from TIA)						
Intersection	F	86.9	1.14	F	98.3	1.19
Eastbound - Access "A"	F	93.1	-	F	100.9	-
Westbound - Antioch Ch Rd	F	102.1	-	F	131.8	-
Northbound - Matthews Weddington Rd	F	97.1	-	F	103.0	-
Southbound - Matthews Weddington Rd	E	63.6	-	E	75.0	-
2027 Build with Improvements Conditions						
Intersection	E	61.9	1.05	D	51.4	0.94
Eastbound - Access "A"	E	62.8	-	E	67.2	-
Westbound - Antioch Ch Rd	F	97.4	-	E	68.3	-
Northbound - Matthews Weddington Rd	D	50.6	-	D	45.8	-
Southbound - Matthews Weddington Rd	D	42.0	-	D	46.4	-

- **Although the SB approach drops from LOS “C” to LOS “D”, the increase in delay is less than 25% and the actual increase in delay is only 8.1 seconds. Therefore, no additional developer required improvements should be deemed necessary.**
- Table 9 – Even with the suggested improvements at this intersection, heavy queueing is still expected and the 95% and/or Max queues exceed storage for ALL turn lanes (except for the EBR) under BWI conditions.
 - Based on NCDOT and Stallings guidelines, there should be additional mitigation for 95th and/or Max queues (whichever is higher) exceeding storage
 - **95% queues do not exceed storage for the NBL, NBR, SBR under the build with improvements conditions. The max queues exceed the storage due to the thru queues extending past the turn lane storage/tapers.**
 - **Additionally, with the committed improvements at the Chestnut RAB, the southbound right turn lane becomes a terminating lane.**



- No Internal Protected Stem (IPS) length was recommended along Access A [NCDOT requirement].
 - **An IPS of 125' will be added to the recommendations and is shown on the attached updated suggested laneage figure.**

Page 28 & 29 – Matthews Weddington Rd & Brayland Ave/Access B:

- Table 10 – The NB approach LOS degrades by one level (B to C) during the AM (based on the comparison of no-build to build).
 - Based on NCDOT and Stallings guidelines, there should be additional mitigation for dropping one level
 - **Although the northbound approach drops from LOS “B” to LOS “C” during the AM peak hour, the increase in delay is less than 25% and the actual increase in delay is only 0.7 seconds. Additionally, the volume on Brayland Ave is only 5 vehicles during the AM peak hour. Therefore, no developer required improvements should be deemed necessary.**
- The first sentence on page 29 should indicate “LOS C during AM and LOS B during PM” not LOS C during both.
 - **The worst leg operates at LOS “C” during both peaks. The worst leg is the southbound approach in the AM peak and the northbound approach in the PM peak.**
- Table 11 – Queues were not reported for the EB & WB approaches along Matthews Weddington Road. Heavy queueing experienced on the EB & WB approaches due to issues at adjacent intersections.
 - **Noted.**
- Heavy queueing experienced along the SB approach (368') during 2027 BWI AM (even with the improvements at Int 2).
 - **Max queues are caused by queueing issues at adjacent intersections.**
- No Internal Protected Stem (IPS) length was recommended along Access B [NCDOT requirement].
 - **An IPS of 100' will be added to the recommendations and is shown on the attached updated suggested laneage figure.**



Page 30-32 – Matthews Weddington Rd/Tilley Morris Rd & Union Day School/Weddington Matthews Rd:

- Table 12 – Even with the TEST improvements at this intersection, the increase in delay on the SB approach is 34% and the LOS degrades by one level (D to E) during the AM (based on the comparison of no-build and Build with TEST improv).
 - Based on NCDOT and Stallings guidelines, there should be additional mitigation for dropping one level and the increase in delay greater than 25%.
 - **See previous response regarding mitigation at this intersection.**
- *Note: ALL 2027 Build/BWI max queues are from the BWI SimTraffic reports (this includes improvements at Int 2)*
 - Minimal increase in queues when comparing Build/BWI and No-Build, with the exception of the EB LT/TH queue increase during the PM peak hour
 - 95% increased 191' and max increased 365' during the PM
 - EBR, WBL, and NBR Max queues exceed storage under No-Build & Build/BWI
 - SBR Max queue exceeds storage under Build/BWI AM
 - Based on NCDOT guidelines, there should be additional mitigation for 95th and/or **Max** queues (whichever is higher) exceeding storage.
 - **Developer is not responsible for mitigating queues exceeding storage that are present under no build conditions. There is no significant increase in queues between no build and build, except for the eastbound left/thru lane, which is a full length lane. Therefore, updated analysis should not be deemed necessary.**
- Heavy queueing experienced on the WB TH-R during AM and EB TH-R during PM (even with the improvements at Int 2).
 - **Developer is not responsible for mitigating queues exceeding storage that are present under no build conditions.**
- Based on SimTraffic simulations it looks like the Roundabout is not operating as it would in the field due to the dual circulating lanes (programmed in Synchro) and the turn lanes.
 - **See previous response for synchro RAB coding.**
- Did not provide flow-scale analysis report for the roundabout in the Appendix, only screenshot in the report.
 - **Noted. The flow-scale analysis reports are attached.**



Page 33 – Matthews Weddington Rd & Access C:

- The report recommended a 75' SBR along Matthews Weddington Road (warranted) but the BWI synchro did not include this improvement.
 - **Noted. The RTL was added based on turn lane warrants rather than analysis results. The RTL has minimal impact on the analysis results. Therefore, updated analysis should not be deemed necessary.**
- Table 16 – Queues were not reported for the NB & SB approaches along Matthews Weddington Road. Heavy queueing experienced on the SB approach lane due to issues at adjacent intersections.
 - **Noted.**
- Heavy queueing experienced along the EB approach (255') during 2027 BWI AM (even with the improvements at Int 2).
 - **Max queues are caused by queueing issues at adjacent intersections.**
- No Internal Protected Stem (IPS) length was recommended along Access C [NCDOT requirement].
 - **An IPS of 100' will be added to the recommendations and is shown on the attached updated suggested laneage figure.**
- Note that the 2032 Build +5 analysis included the 2027 BWI improvements and optimized timings at Int 2 but NOT the recommended 75' SBR at this intersection).
 - **Noted. The RTL was added based on turn lane warrants rather than analysis results. The RTL has minimal impact on the analysis results. Therefore, updated analysis should not be deemed necessary.**

SimTraffic Queueing Comments

- Did not provide SimTraffic Queueing reports for Existing (2025), Build (2027), and Build (2032) scenarios in the report or Appendix.
 - **SimTraffic queueing analysis was consistent with NCDOT's Congestion Management current practices, which does not require queueing analysis for existing, build without improvements, or build +5 scenarios.**
- No-Build AM:
 - SimTraffic shows grid lock along Matthews Weddington Road (traveling southwest)
 - This results in heavy queueing along Chestnut Lane and Antioch Church Road
 - **Noted.**



- No-Build PM:
 - SimTraffic shows heavy queueing at Int 2 (signal) backing into adjacent intersections along Matthews Weddington Road
 - This results in heavy queueing along the SB approach at Int 1 (RAB) and the EB approach at Int 3 (RIRO)
 - **Noted.**
 - SimTraffic shows heavy queueing on the EB approach at Int 4 (RAB)
 - **Noted.**
 - Same SimTraffic simulations comment about the roundabouts.
 - **See previous response.**
- 2027 BWI AM:
 - This scenario includes the improvements at Int 2 but not the recommended WBR (100') at Access B & the SBR (75') at Access C.
 - **Noted. The RTL was added based on turn lane warrants rather than analysis results. The RTL has minimal impact on the analysis results. Therefore, updated analysis should not be deemed necessary.**
 - SimTraffic shows grid lock along Matthews Weddington Road (traveling southwest) likely due to the heavy queueing along the WB approach at Int 4 (RAB).
 - This results in heavy queueing at adjacent intersections.
 - **Noted.**
 - Same SimTraffic simulations comment about the roundabouts.
 - **See previous response.**
- 2027 BWI PM:
 - This scenario includes the improvements at Int 2 but not the recommended WBR (100') at Access B & the SBR (75') at Access C.
 - **Noted. The RTL was added based on turn lane warrants rather than analysis results. The RTL has minimal impact on the analysis results. Therefore, updated analysis should not be deemed necessary.**
 - SimTraffic shows heavy queueing along the SB approach at Int 1 (RAB) and the EB approach at Int 4 (RAB).
 - **Noted.**
 - Same SimTraffic simulations comment about the roundabouts.
 - **See previous response.**



Appendix Comments:

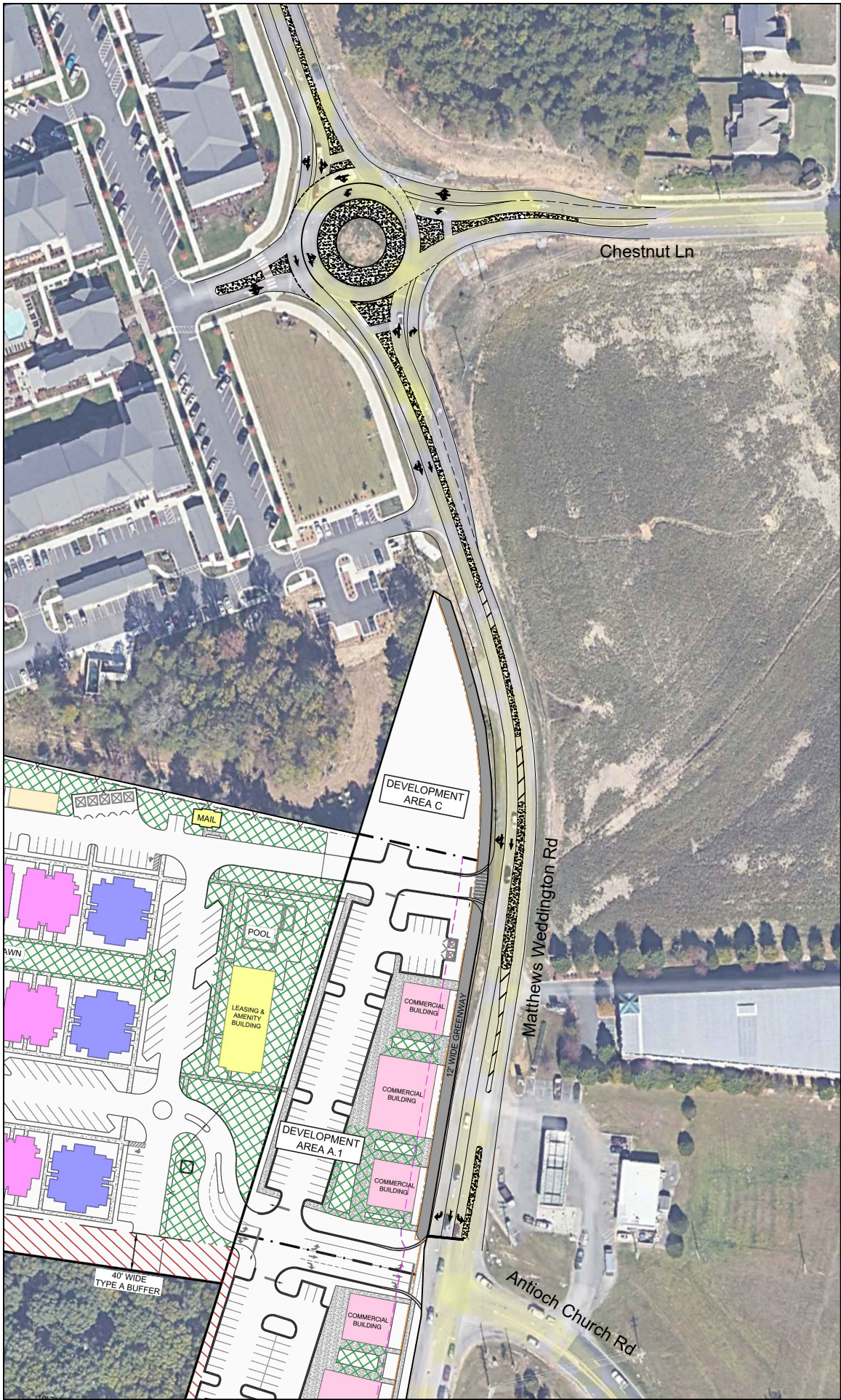
- The Appendix needs to include the following:
 - The updated NCHRP Internal Capture Spreadsheet
 - **The NCHRP Internal Capture spreadsheet is attached.**
 - SimTraffic reports for all scenarios
 - **SimTraffic is only required for future conditions, typically only No Build and Build with Improvements.**
 - Flow-Scale analysis reports from SIDRA
 - **Noted. The flow-scale analysis reports are attached.**

Please contact us should you need any additional information.

Attachments:

Updated Suggested Laneage Figure
Matthews Weddington Rd & Chestnut Ln Improvements Concept Plan
Updated Rezoning Plan (5/15/2025)
Updated NCHRP Internal Capture Spreadsheet
SIDRA Flow-Scale Analysis Reports
Intersection 2 Manually Adjusted 2027 Build w/ Imp AM Peak Synchro Report
Intersection 4 SIDRA Movement Summaries
Town of Stallings TIA Review (5/27/2025)
Response Email (6/6/2025) to NCDOT Comments (6/3/2025)

cc:	Amelia Helms, PE	NCDOT
	Felix Obregon, PE	NCDOT
	Tou Lee, PE	NCDOT
	File	



LANDSCAPE ARCHITECTURE
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THE COTTAGE GREEN

STALLINGS, NORTH CAROLINA

HMF AMERICANA, LLC
PO BOX 7862
THE WOODLANDS, TX 77387

INTERSECTION 1 IMPROVEMENTS CONCEPT

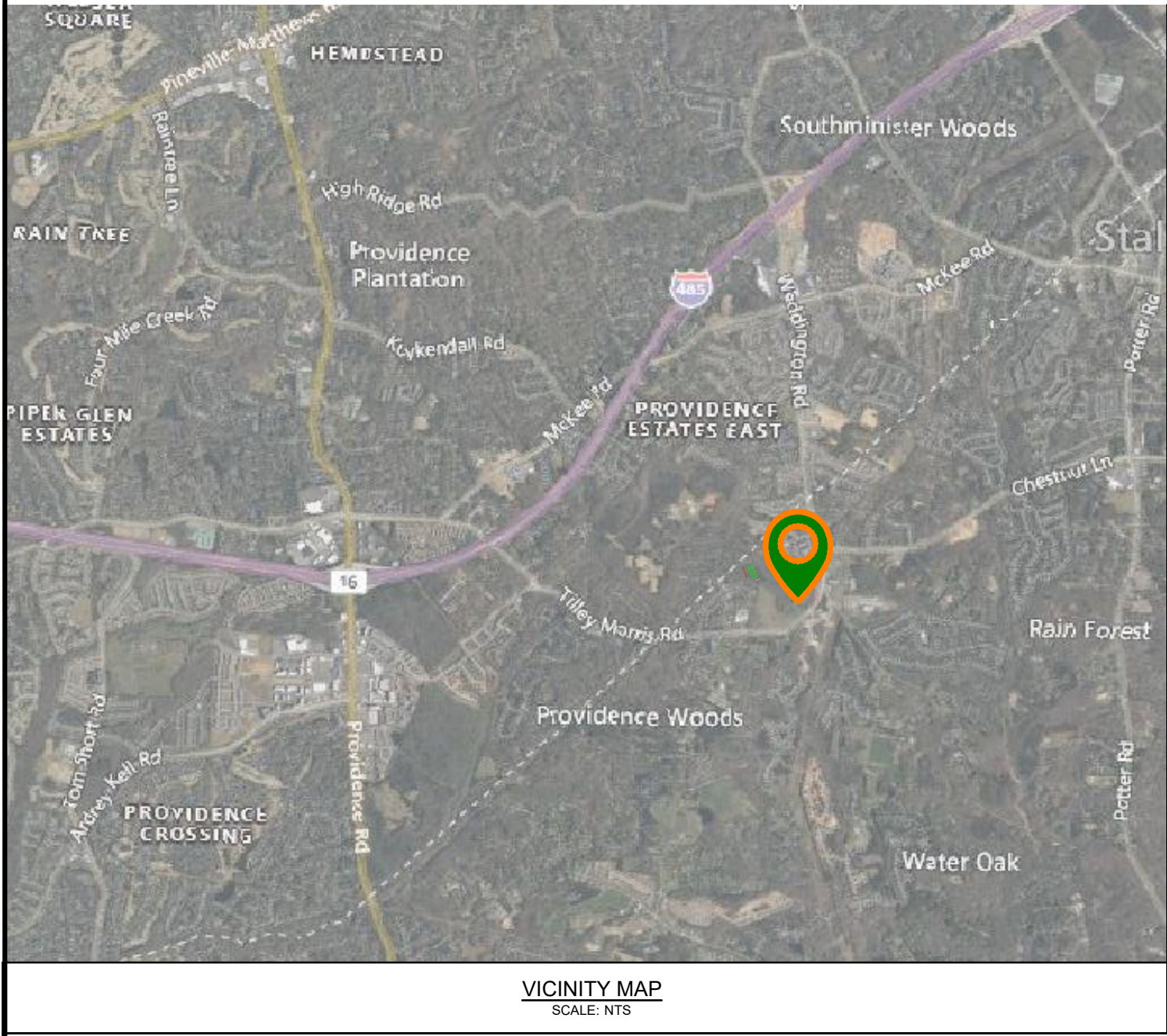
0' 75' 150' N
SCALE: 1" = 150'

PROJECT #: 1134-001
DRAWN BY: CRB
CHECKED BY: REG

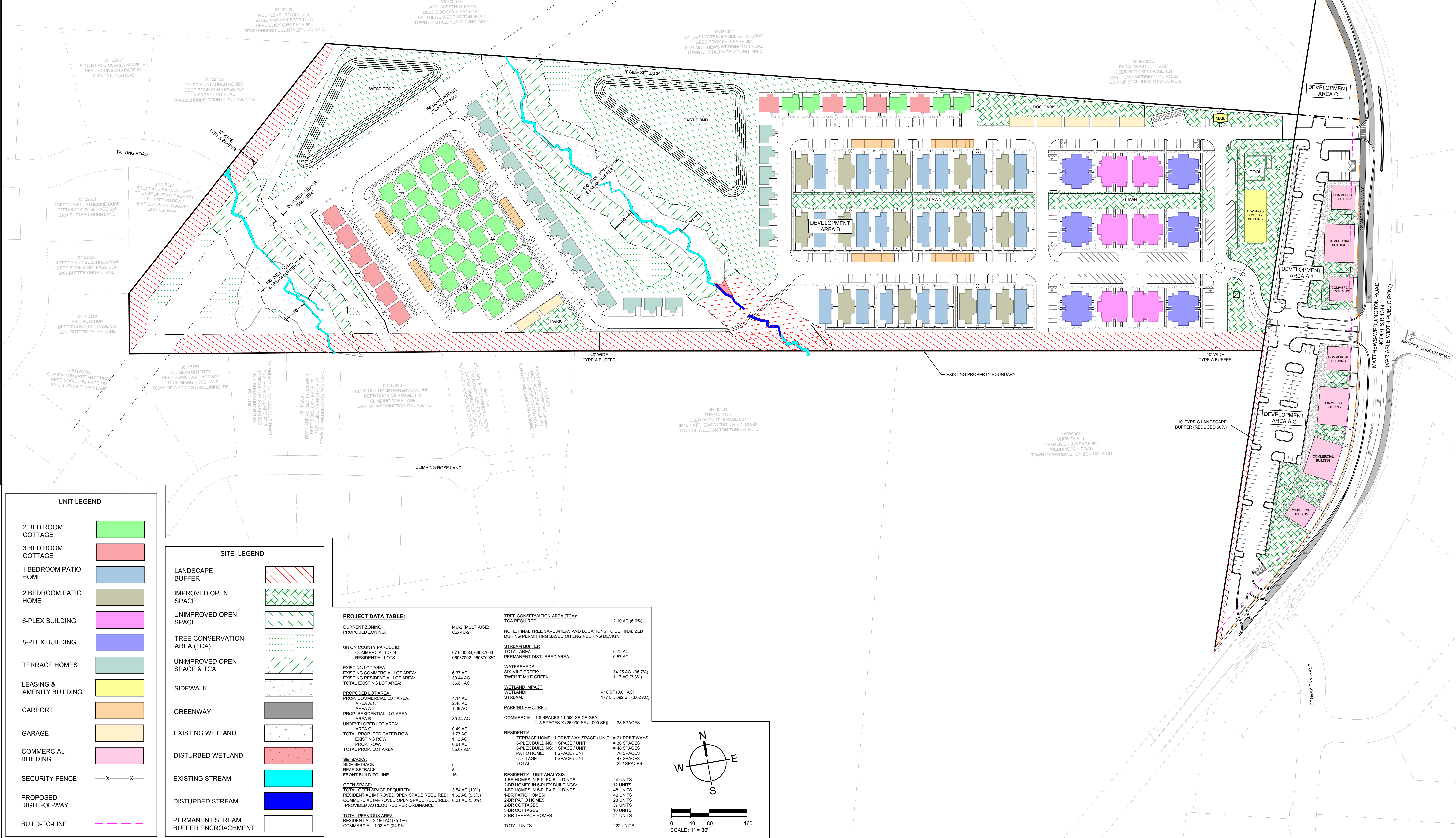
JUNE 2025

REVISIONS:

Exhibit A



VICINITY MAP
SCALE: NTS

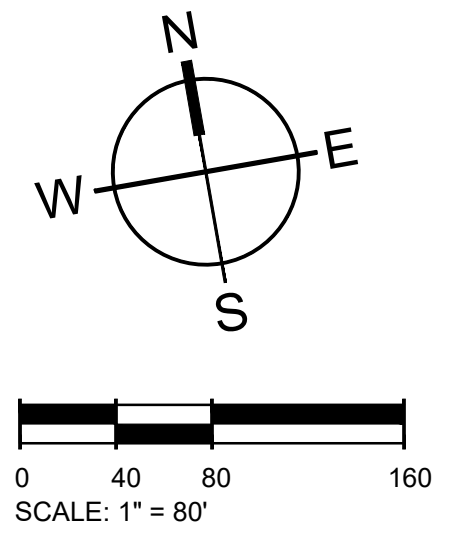


UNIT LEGEND	
2 BED ROOM COTTAGE	
3 BED ROOM COTTAGE	
1 BEDROOM PATIO HOME	
2 BEDROOM PATIO HOME	
6-PLEX BUILDING	
8-PLEX BUILDING	
TERRACE HOMES	
LEASING & AMENITY BUILDING	
CARPORT	
GARAGE	
COMMERCIAL BUILDING	
SECURITY FENCE	— X — X —
PROPOSED RIGHT-OF-WAY	
BUILD-TO-LINE	

SITE LEGEND	
LANDSCAPE BUFFER	
IMPROVED OPEN SPACE	
UNIMPROVED OPEN SPACE	
TREE CONSERVATION AREA (TCA)	
UNIMPROVED OPEN SPACE & TCA	
SIDEWALK	
GREENWAY	
EXISTING WETLAND	
DISTURBED WETLAND	
EXISTING STREAM	
DISTURBED STREAM	
PERMANENT STREAM BUFFER ENCROACHMENT	

PROJECT DATA TABLE:	
CURRENT ZONING:	MU-2 (MULTI-USE)
PROPOSED ZONING:	CZ-MU-2
UNION COUNTY PARCEL ID:	0715009G, 06087003
COMMERCIAL LOTS:	06087002, 06087002C
EXISTING LOT AREA:	6.37 AC
EXISTING COMMERCIAL LOT AREA:	30.44 AC
EXISTING RESIDENTIAL LOT AREA:	36.81 AC
TOTAL EXISTING LOT AREA:	67.22 AC
PROPOSED LOT AREA:	4.14 AC
PROP. COMMERCIAL LOT AREA:	2.48 AC
AREA A-1:	1.12 AC
AREA A-2:	1.66 AC
PROP. RESIDENTIAL LOT AREA:	30.44 AC
AREA B:	0.49 AC
UNDEVELOPED LOT AREA:	1.73 AC
EXISTING ROW:	1.12 AC
PROP. ROW:	0.61 AC
TOTAL PROP. LOT AREA:	35.07 AC
SETBACKS:	5'
REAR SETBACK:	5'
FRONT BUILD TO LINE:	16'
OPEN SPACE:	3.54 AC (10%)
RESIDENTIAL IMPROVED OPEN SPACE REQUIRED:	1.52 AC (5.0%)
COMMERCIAL IMPROVED OPEN SPACE REQUIRED:	0.21 AC (5.0%)
*PROVIDED AS REQUIRED PER ORDINANCE	
TOTAL PERVIOUS AREA:	22.86 AC (75.1%)
COMMERCIAL: 1.03 AC (24.9%)	

TREE CONSERVATION AREA (TCA):	
TCA REQUIRED:	2.10 AC (6.0%)
NOTE: FINAL TREE SAVE AREAS AND LOCATIONS TO BE FINALIZED DURING PERMITTING BASED ON ENGINEERING DESIGN	
STREAM BUFFER:	6.72 AC
TOTAL AREA:	0.57 AC
PERMANENT DISTURBED AREA:	
WATERSHEDS:	
SIX MILE CREEK:	34.25 AC (96.7%)
TWELVE MILE CREEK:	1.17 AC (3.3%)
WETLAND IMPACT:	
WETLAND:	416 SF (0.01 AC)
STREAK:	177 LF, 692 SF (0.02 AC)
PARKING REQUIRED:	
COMMERCIAL: 1.5 SPACES / 1,000 SF OF GFA	
(1.5 SPACES X (25,000 SF / 1,000 SF)) = 38 SPACES	
RESIDENTIAL:	
TERRACE HOME: 1 DRIVEWAY SPACE / UNIT	= 21 DRIVEWAYS
6-PLEX BUILDING: 1 SPACE / UNIT	= 36 SPACES
8-PLEX BUILDING: 1 SPACE / UNIT	= 48 SPACES
PATIO HOME: 1 SPACE / UNIT	= 70 SPACES
COTTAGE: 1 SPACE / UNIT	= 47 SPACES
TOTAL:	= 222 SPACES
RESIDENTIAL UNIT ANALYSIS:	
1-BR HOMES IN 6-PLEX BUILDINGS:	24 UNITS
2-BR HOMES IN 6-PLEX BUILDINGS:	12 UNITS
1-BR HOMES IN 8-PLEX BUILDINGS:	48 UNITS
1-BR PATIO HOMES:	42 UNITS
2-BR PATIO HOMES:	28 UNITS
2-BR COTTAGES:	37 UNITS
3-BR COTTAGES:	10 UNITS
3-BR TERRACE HOMES:	21 UNITS
TOTAL UNITS:	222 UNITS



NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	PAH
Scenario Description:				Date:	1/9/2025
Analysis Year:				Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	32,700	SF	77	46	31
Restaurant	932	10,900	SF	149	85	64
Cinema/Entertainment				0		
Residential	210;215	222	DU	135	34	101
Hotel				0		
All Other Land Uses ²				0		
				361	165	196

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		4	0	1	0
Restaurant	0	4		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	19	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	397	182	215
Internal Capture Percentage	16%	17%	14%
External Vehicle-Trips ⁵	305	138	167
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	15%
Restaurant	24%	9%
Cinema/Entertainment	N/A	N/A
Residential	8%	18%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	PAH
Scenario Description:				Date:	1/9/2025
Analysis Year:				Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	32,700	SF	215	108	107
Restaurant	932	10,900	SF	178	91	87
Cinema/Entertainment				0		
Residential	210;215	222	DU	167	103	64
Hotel				0		
All Other Land Uses ²				0		
				560	302	258

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4000	4000		4000	
Retail					4000	
Restaurant					4000	
Cinema/Entertainment					4000	
Residential		4000	4000			
Hotel					4000	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		29	0	3	0
Restaurant	0	39		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	1	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	616	332	284
Internal Capture Percentage	24%	23%	26%
External Vehicle-Trips ⁵	424	234	190
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	34%	27%
Restaurant	30%	43%
Cinema/Entertainment	N/A	N/A
Residential	4%	3%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	CRB
Scenario Description:	Reduced Trip Gen			Date:	5/14/2025
Analysis Year:				Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	19,100	SF	45	27	18
Restaurant	932	10,900	SF	149	85	64
Cinema/Entertainment				0		
Residential	210;215	222	DU	135	34	101
Hotel				0		
All Other Land Uses ²				0		
				329	146	183

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		3	0	1	0
Restaurant	0	2		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	19	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	362	161	201
Internal Capture Percentage	15%	17%	14%
External Vehicle-Trips ⁵	279	121	158
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	20%
Restaurant	23%	6%
Cinema/Entertainment	N/A	N/A
Residential	8%	18%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	CRB
Scenario Description:	Reduced Trip Gen			Date:	5/14/2025
Analysis Year:				Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	19,100	SF	126	63	63
Restaurant	932	10,900	SF	178	91	87
Cinema/Entertainment				0		
Residential	210;215	222	DU	167	103	64
Hotel				0		
All Other Land Uses ²				0		
				471	257	214

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4000	4000		4000	
Retail					4000	
Restaurant					4000	
Cinema/Entertainment					4000	
Residential		4000	4000			
Hotel					4000	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		20	0	2	0
Restaurant	0	35		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	1	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	517	282	235
Internal Capture Percentage	24%	22%	26%
External Vehicle-Trips ⁵	360	201	159
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	52%	32%
Restaurant	21%	39%
Cinema/Entertainment	N/A	N/A
Residential	4%	3%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Demand Analysis

Demand Analysis (Design Life / Flow Scale) Results Site: 2025 Existing AM

Site ID: 1
Roundabout

Design Life Analysis - Specified Target: Zero Practical Spare Capacity
Results are reported for year 0 based on specified target.

The Design Life target was exceeded in all future years.
Results are reported for the current conditions.

Results in the table below are given for Intersection - Vehicles

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	2987	0.833	2	14.2	0.76	12.2	95.9	1093.1
1	2950	0.861	-1	15.2	0.79	13.7	101.5	1127.6
2	2914	0.888	-4	16.4	0.83	15.4	107.9	1164.7

Demand Analysis

Demand Analysis (Design Life / Flow Scale) Results Site: 2027 Build PM

Site ID: 1
Roundabout

Design Life Analysis - Specified Target: Zero Practical Spare Capacity
Results are reported for year 11 based on specified target.

Results in the table below are given for Intersection - Vehicles

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	3607	0.648	31	9.2	0.56	7.7	73.0	958.0
1	3584	0.665	28	9.5	0.58	8.4	75.9	980.9
2	3561	0.682	25	9.9	0.60	9.1	79.2	1004.2
3	3538	0.700	21	10.2	0.63	9.8	82.9	1028.0
4	3515	0.718	18	10.6	0.66	10.7	86.7	1052.3
5	3493	0.736	16	11.0	0.69	11.5	91.0	1077.2
6	3471	0.754	13	11.5	0.73	12.5	95.4	1102.7
7	3448	0.772	10	11.9	0.76	13.5	100.0	1128.9
8	3426	0.791	7	12.5	0.80	14.7	105.0	1155.9
9	3404	0.810	5	13.1	0.83	15.9	110.2	1183.9
10	3383	0.829	3	13.7	0.87	17.3	115.8	1212.9
11	3361	0.848	0	14.4	0.91	18.9	121.9	1243.2
12	3340	0.868	-2	15.2	0.95	20.6	128.3	1274.8
13	3318	0.887	-4	16.1	0.99	22.6	135.2	1308.0
14	3297	0.907	-6	17.2	1.02	24.7	142.7	1343.2
15	3276	0.927	-8	18.3	1.06	27.2	150.9	1380.6
16	3255	0.948	-10	19.6	1.11	29.9	159.8	1420.7
17	3234	0.968	-12	21.1	1.16	32.9	169.6	1463.6
18	3213	0.989	-14	22.8	1.21	36.3	180.2	1509.7
19	3193	1.010	-16	24.6	1.26	40.1	192.0	1558.9
20	3172	1.031	-18	26.6	1.32	43.7	203.8	1611.3

Demand Analysis

Demand Analysis (Design Life / Flow Scale) Results Site: 2025 Existing PM

Site ID: 4
Roundabout

Design Life Analysis - Specified Target: Zero Practical Spare Capacity
Results are reported for year 1 based on specified target.

Results in the table below are given for Intersection - Vehicles

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	2985	0.816	4	13.1	0.78	12.0	90.8	1046.7
1	2951	0.842	1	14.0	0.81	13.4	95.8	1078.1
2	2917	0.868	-2	15.0	0.84	15.0	101.3	1111.6

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	25	25	384	27	330	48	483	187	202	694	21
Future Volume (vph)	75	25	25	384	27	330	48	483	187	202	694	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		125	275		0	150		225	250		175
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.861				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1604	0	1770	1863	1568	1736	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1604	0	1770	1863	1568	1736	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1061			1073			667			652	
Travel Time (s)		28.9			16.3			10.1			9.9	
Peak Hour Factor	0.90	0.90	0.90	0.82	0.90	0.90	0.90	0.75	0.75	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	3%	4%	2%	2%
Adj. Flow (vph)	83	28	28	468	30	367	53	644	249	224	771	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	28	28	468	397	0	53	644	249	224	771	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			16			20	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2	3	1	6	7

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4						2			6
Detector Phase	7	4	5	3	8		5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	20.0		14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	14.0	14.0	14.0	32.0	32.0		14.0	45.0	32.0	29.0	60.0	14.0
Total Split (%)	11.7%	11.7%	11.7%	26.7%	26.7%		11.7%	37.5%	26.7%	24.2%	50.0%	11.7%
Maximum Green (s)	7.0	7.0	7.0	25.0	25.0		7.0	38.0	25.0	22.0	53.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-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	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Max	None	None	Max	None
Act Effct Green (s)	9.1	9.1	17.1	29.9	27.2		9.1	41.4	76.3	20.9	56.6	70.7
Actuated g/C Ratio	0.08	0.08	0.15	0.26	0.24		0.08	0.36	0.66	0.18	0.49	0.61
v/c Ratio	0.60	0.19	0.12	1.02	1.05		0.38	0.96	0.24	0.71	0.85	0.02
Control Delay	72.0	55.6	42.5	91.3	104.7		61.5	65.3	10.2	58.4	38.2	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	55.6	42.5	91.3	104.7		61.5	65.3	10.2	58.4	38.2	11.2
LOS	E	E	D	F	F		E	E	B	E	D	B
Approach Delay		62.8			97.4			50.6			42.0	
Approach LOS		E			F			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 115.4

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 61.9

Intersection Capacity Utilization 86.7%

Analysis Period (min) 15

Intersection LOS: E

ICU Level of Service E

Splits and Phases: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.
Timing Plan: AM Peak

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	28	28	468	397	53	644	249	224	771	23
v/c Ratio	0.60	0.19	0.12	1.02	1.05	0.38	0.96	0.24	0.71	0.85	0.02
Control Delay	72.0	55.6	42.5	91.3	104.7	61.5	65.3	10.2	58.4	38.2	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	55.6	42.5	91.3	104.7	61.5	65.3	10.2	58.4	38.2	11.2
Queue Length 50th (ft)	64	21	18	~433	~349	40	~498	83	163	539	7
Queue Length 95th (ft)	#133	52	45	#556	#546	83	#555	105	248	#793	19
Internal Link Dist (ft)		981			993		587			572	
Turn Bay Length (ft)	125		125	275		150		225	250		175
Base Capacity (vph)	138	146	235	458	377	138	668	1037	364	912	969
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.19	0.12	1.02	1.05	0.38	0.96	0.24	0.62	0.85	0.02

Intersection Summary

- ~ 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.

MOVEMENT SUMMARY

 **Site: 4 [2027 Build AM - Reduced Trip Gen (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	353	2.0	392	2.0	0.741	20.6	LOS C	8.4	213.9	0.86	1.19	1.82	27.3
8	T1	106	3.0	174	3.0	0.741	20.7	LOS C	8.4	213.9	0.86	1.19	1.82	27.2
18	R2	329	2.0	366	2.0	0.477	11.3	LOS B	2.9	74.0	0.70	0.80	0.99	31.0
Approach		788	2.1	932	2.2	0.741	17.0	LOS C	8.4	213.9	0.80	1.04	1.49	28.6
East: Matthews Weddington Rd														
1	L2	314	2.0	349	2.0	0.480	11.9	LOS B	2.9	73.0	0.71	0.82	1.03	29.8
6	T1	634	2.0	704	2.0	1.334	178.0	LOS F	93.5	2375.1	1.00	4.44	11.30	9.6
16	R2	164	2.0	265	2.0	1.334	178.0	LOS F	93.5	2375.1	1.00	4.44	11.30	9.5
Approach		1112	2.0	1318	2.0	1.334	134.0	LOS F	93.5	2375.1	0.92	3.48	8.58	11.7
North: Union Day School														
7	L2	134	2.0	268	2.0	0.843	41.7	LOS E	7.3	185.8	0.92	1.36	2.54	21.9
4	T1	62	2.0	119	2.0	0.843	41.7	LOS E	7.3	185.8	0.92	1.36	2.54	21.9
14	R2	106	2.0	193	2.0	0.484	19.5	LOS C	2.2	54.7	0.81	0.93	1.24	27.8
Approach		302	2.0	580	2.0	0.843	34.3	LOS D	7.3	185.8	0.88	1.22	2.11	23.5
West: Tilley Morris Rd														
5	L2	76	2.0	133	2.0	0.535	13.6	LOS B	3.4	88.3	0.74	0.88	1.17	30.4
2	T1	214	4.0	238	4.0	0.535	13.7	LOS B	3.4	88.3	0.74	0.88	1.17	30.3
12	R2	54	4.0	60	4.0	0.087	6.2	LOS A	0.3	8.0	0.57	0.54	0.57	33.4
Approach		344	3.6	431	3.4	0.535	12.6	LOS B	3.4	88.3	0.72	0.84	1.09	30.7
All Vehicles		2546	2.3	3260	2.2	1.334	66.8	LOS F	93.5	2375.1	0.85	2.03	4.41	17.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 Build PM - Reduced Trip Gen (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	66	3.0	73	3.0	0.291	10.4	LOS B	1.1	29.0	0.68	0.70	0.73	31.6
8	T1	49	2.0	92	2.0	0.291	10.3	LOS B	1.1	29.0	0.68	0.70	0.73	31.5
18	R2	234	2.0	260	2.0	0.455	13.7	LOS B	2.3	58.7	0.74	0.84	1.07	30.0
Approach		349	2.2	426	2.2	0.455	12.4	LOS B	2.3	58.7	0.71	0.78	0.94	30.6
East: Matthews Weddington Rd														
1	L2	257	2.0	286	2.0	0.266	5.9	LOS A	1.2	30.9	0.44	0.34	0.44	32.3
6	T1	332	2.0	369	2.0	0.515	9.4	LOS A	3.3	84.2	0.58	0.48	0.61	33.0
16	R2	144	2.0	185	2.0	0.515	9.4	LOS A	3.3	84.2	0.58	0.48	0.61	32.0
Approach		733	2.0	839	2.0	0.515	8.2	LOS A	3.3	84.2	0.53	0.43	0.55	32.5
North: Union Day School														
7	L2	151	2.0	256	2.0	0.514	12.5	LOS B	3.2	80.7	0.71	0.84	1.09	30.3
4	T1	66	2.0	125	2.0	0.514	12.5	LOS B	3.2	80.7	0.71	0.84	1.09	30.2
14	R2	69	2.0	113	2.0	0.169	7.3	LOS A	0.6	15.7	0.59	0.59	0.59	32.9
Approach		286	2.0	494	2.0	0.514	11.3	LOS B	3.2	80.7	0.68	0.78	0.98	30.8
West: Tilley Morris Rd														
5	L2	73	2.0	112	2.0	0.938	42.6	LOS E	20.7	526.8	1.00	1.84	3.48	22.2
2	T1	532	2.0	591	2.0	0.938	42.6	LOS E	20.7	526.8	1.00	1.84	3.48	22.2
12	R2	174	2.0	193	2.0	0.258	7.7	LOS A	1.0	26.5	0.61	0.61	0.61	32.7
Approach		779	2.0	897	2.0	0.938	35.1	LOS E	20.7	526.8	0.92	1.58	2.86	23.8
All Vehicles		2147	2.0	2655	2.0	0.938	18.5	LOS C	20.7	526.8	0.72	0.94	1.47	28.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 Build w Test Imp AM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	353	2.0	392	2.0	0.744	20.8	LOS C	8.5	215.2	0.87	1.20	1.84	27.3
8	T1	106	3.0	174	3.0	0.744	20.9	LOS C	8.5	215.2	0.87	1.20	1.84	27.2
18	R2	332	2.0	369	2.0	0.483	11.5	LOS B	3.0	75.8	0.70	0.81	1.00	31.0
Approach		791	2.1	935	2.2	0.744	17.1	LOS C	8.5	215.2	0.80	1.04	1.51	28.6
East: Matthews Weddington Rd														
1	L2	315	2.0	350	2.0	0.910	38.6	LOS E	17.1	434.6	1.00	1.72	3.15	22.7
6	T1	636	2.0	707	2.0	0.910	38.6	LOS E	17.1	434.6	1.00	1.72	3.15	22.9
16	R2	164	2.0	265	2.0	0.910	38.6	LOS E	17.1	434.6	1.00	1.72	3.15	22.6
Approach		1115	2.0	1321	2.0	0.910	38.6	LOS E	17.1	434.6	1.00	1.72	3.15	22.8
North: Union Day School														
7	L2	134	2.0	268	2.0	0.676	29.4	LOS D	3.7	94.4	0.88	1.11	1.73	24.4
4	T1	62	2.0	119	2.0	0.351	18.0	LOS C	1.3	33.1	0.82	0.88	1.06	29.4
14	R2	106	2.0	193	2.0	0.567	26.4	LOS D	2.6	66.5	0.87	1.02	1.46	25.5
Approach		302	2.0	580	2.0	0.676	26.1	LOS D	3.7	94.4	0.86	1.03	1.50	25.6
West: Tilley Morris Rd														
5	L2	76	2.0	133	2.0	0.516	12.7	LOS B	3.1	80.6	0.71	0.84	1.11	30.8
2	T1	217	4.0	241	4.0	0.516	12.7	LOS B	3.1	80.6	0.71	0.84	1.11	30.7
12	R2	54	4.0	60	4.0	0.092	6.6	LOS A	0.3	8.2	0.57	0.55	0.57	33.2
Approach		347	3.6	434	3.4	0.516	11.9	LOS B	3.1	80.6	0.69	0.80	1.03	31.1
All Vehicles		2555	2.3	3270	2.2	0.910	26.7	LOS D	17.1	434.6	0.88	1.28	2.11	25.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 Build w Test Imp PM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	66	3.0	73	3.0	0.294	10.5	LOS B	1.2	29.4	0.68	0.70	0.74	31.6
8	T1	49	2.0	92	2.0	0.294	10.5	LOS B	1.2	29.4	0.68	0.70	0.74	31.5
18	R2	239	2.0	266	2.0	0.469	14.2	LOS B	2.4	61.4	0.74	0.85	1.10	29.8
Approach		354	2.2	431	2.2	0.469	12.8	LOS B	2.4	61.4	0.72	0.79	0.96	30.5
East: Matthews Weddington Rd														
1	L2	262	2.0	291	2.0	0.396	7.5	LOS A	2.1	52.6	0.50	0.40	0.50	32.3
6	T1	338	2.0	376	2.0	0.396	7.5	LOS A	2.1	52.6	0.50	0.40	0.50	33.3
16	R2	144	2.0	185	2.0	0.396	7.5	LOS A	2.1	52.6	0.50	0.40	0.50	32.9
Approach		744	2.0	851	2.0	0.396	7.5	LOS A	2.1	52.6	0.50	0.40	0.50	32.8
North: Union Day School														
7	L2	151	2.0	256	2.0	0.349	9.3	LOS A	1.5	38.8	0.64	0.67	0.73	30.8
4	T1	66	2.0	125	2.0	0.189	7.7	LOS A	0.7	17.7	0.60	0.60	0.60	33.9
14	R2	69	2.0	113	2.0	0.171	7.4	LOS A	0.6	15.9	0.59	0.59	0.59	32.6
Approach		286	2.0	494	2.0	0.349	8.4	LOS A	1.5	38.8	0.62	0.63	0.67	32.0
West: Tilley Morris Rd														
5	L2	73	2.0	112	2.0	0.916	37.9	LOS E	18.6	472.2	1.00	1.76	3.24	23.3
2	T1	540	2.0	600	2.0	0.916	37.9	LOS E	18.6	472.2	1.00	1.76	3.24	23.2
12	R2	174	2.0	193	2.0	0.274	8.4	LOS A	1.1	27.5	0.61	0.61	0.61	32.3
Approach		787	2.0	906	2.0	0.916	31.6	LOS D	18.6	472.2	0.92	1.51	2.68	24.7
All Vehicles		2171	2.0	2682	2.0	0.916	16.7	LOS C	18.6	472.2	0.70	0.88	1.34	29.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 Build w Test Imp AM - Reduced Trip Gen (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	353	2.0	392	2.0	0.741	20.6	LOS C	8.4	213.9	0.86	1.19	1.82	27.3
8	T1	106	3.0	174	3.0	0.741	20.7	LOS C	8.4	213.9	0.86	1.19	1.82	27.2
18	R2	329	2.0	366	2.0	0.477	11.3	LOS B	2.9	74.0	0.70	0.80	0.99	31.0
Approach		788	2.1	932	2.2	0.741	17.0	LOS C	8.4	213.9	0.80	1.04	1.49	28.6
East: Matthews Weddington Rd														
1	L2	314	2.0	349	2.0	0.907	38.2	LOS E	16.9	429.5	1.00	1.71	3.13	22.8
6	T1	634	2.0	704	2.0	0.907	38.2	LOS E	16.9	429.5	1.00	1.71	3.13	23.0
16	R2	164	2.0	265	2.0	0.907	38.2	LOS E	16.9	429.5	1.00	1.71	3.13	22.7
Approach		1112	2.0	1318	2.0	0.907	38.2	LOS E	16.9	429.5	1.00	1.71	3.13	22.9
North: Union Day School														
7	L2	134	2.0	268	2.0	0.674	29.2	LOS D	3.7	94.0	0.88	1.10	1.72	24.4
4	T1	62	2.0	119	2.0	0.350	17.9	LOS C	1.3	33.0	0.81	0.88	1.06	29.4
14	R2	106	2.0	193	2.0	0.565	26.3	LOS D	2.6	66.2	0.87	1.02	1.45	25.6
Approach		302	2.0	580	2.0	0.674	25.9	LOS D	3.7	94.0	0.86	1.03	1.49	25.7
West: Tilley Morris Rd														
5	L2	76	2.0	133	2.0	0.511	12.5	LOS B	3.1	79.1	0.71	0.83	1.09	30.9
2	T1	214	4.0	238	4.0	0.511	12.6	LOS B	3.1	79.1	0.71	0.83	1.09	30.8
12	R2	54	4.0	60	4.0	0.092	6.6	LOS A	0.3	8.2	0.57	0.55	0.57	33.2
Approach		344	3.6	431	3.4	0.511	11.7	LOS B	3.1	79.1	0.69	0.79	1.02	31.1
All Vehicles		2546	2.3	3260	2.2	0.907	26.5	LOS D	16.9	429.5	0.88	1.28	2.09	25.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 4 [2027 Build w Test Imp PM - Reduced Trip Gen (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	66	3.0	73	3.0	0.291	10.4	LOS B	1.1	29.0	0.68	0.70	0.73	31.6
8	T1	49	2.0	92	2.0	0.291	10.3	LOS B	1.1	29.0	0.68	0.70	0.73	31.5
18	R2	234	2.0	260	2.0	0.455	13.7	LOS B	2.3	58.7	0.74	0.84	1.07	30.0
Approach		349	2.2	426	2.2	0.455	12.4	LOS B	2.3	58.7	0.71	0.78	0.94	30.6
East: Matthews Weddington Rd														
1	L2	257	2.0	286	2.0	0.390	7.4	LOS A	2.0	51.5	0.50	0.40	0.50	32.4
6	T1	332	2.0	369	2.0	0.390	7.4	LOS A	2.0	51.5	0.50	0.40	0.50	33.3
16	R2	144	2.0	185	2.0	0.390	7.4	LOS A	2.0	51.5	0.50	0.40	0.50	32.9
Approach		733	2.0	839	2.0	0.390	7.4	LOS A	2.0	51.5	0.50	0.40	0.50	32.9
North: Union Day School														
7	L2	151	2.0	256	2.0	0.346	9.1	LOS A	1.5	38.1	0.63	0.66	0.72	30.9
4	T1	66	2.0	125	2.0	0.186	7.6	LOS A	0.7	17.5	0.60	0.60	0.60	34.0
14	R2	69	2.0	113	2.0	0.169	7.3	LOS A	0.6	15.7	0.59	0.59	0.59	32.7
Approach		286	2.0	494	2.0	0.346	8.3	LOS A	1.5	38.1	0.61	0.63	0.66	32.0
West: Tilley Morris Rd														
5	L2	73	2.0	112	2.0	0.900	35.3	LOS E	17.2	437.5	0.99	1.69	3.05	23.9
2	T1	532	2.0	591	2.0	0.900	35.3	LOS E	17.2	437.5	0.99	1.69	3.05	23.8
12	R2	174	2.0	193	2.0	0.273	8.3	LOS A	1.1	27.3	0.61	0.61	0.61	32.4
Approach		779	2.0	897	2.0	0.900	29.5	LOS D	17.2	437.5	0.91	1.46	2.52	25.3
All Vehicles		2147	2.0	2655	2.0	0.900	15.9	LOS C	17.2	437.5	0.69	0.86	1.28	29.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

Project/Report: The Cottage Green – TIA Review	
Prepared By:	Design Resource Group – April 2025
Reviewed By:	Town of Stallings & Bolton and Menk
Review Completed	May 27, 2025.

TRAFFIC IMPACT ANALYSIS (TIA)

BUILD TRAFFIC CONDITIONS

Site Trip Generation

- Land use & densities differ from the scoping checklist and the TIA; however, it was noted that they differ in the TIA. The densities in the TIA do not match what is shown in the site plan (site plan shows 70 single-family detached and 68 single-family attached but opposite in the report) this could change the site trip calcs.
- Was the NCHRP Internal Capture spreadsheet utilized and approved during scoping/ in the MOU, if applicable? Y / N / N/A
 - Internal Capture spreadsheet in the Appendix was the old one from the scoping checklist (old land use & densities). The Internal Capture spreadsheet calculating the updated trip gen from the TIA was **NOT** included in the Appendix.

Pass-By and Internal Capture (if applicable)

- Do entering and exiting pass-by trips adjusted to equal one another? Y / **N** / N/A

SYNCHRO/SIDRA QAQC:

- Note that the Build 2032 Synchro file contained the improvements recommended at Int 2 from the 2027 BWI Synchro.

Node #	Comments
1	-(Synchro) RAB should not have 2 circulating lanes (maybe due to limitations in Synchro), could provide false SimTraffic queueing reports due to the 2 circulating lanes.
2	
3	-Based on google earth, it looks like there is unmarked pavement that could be utilized as an EBR turn lane with approximately 50' of storage along Matthews Weddington Rd. -Build/BWI (2025/2032) AM - northern leg "Access B" link should have a min of 1,000' -BWI does not include the 100' westbound right-turn lane recommended in the TIA
4	-(Synchro) RAB should not have 2 circulating lanes (maybe due to limitations in Synchro), could provide false SimTraffic queueing reports due to the 2 circulating lanes. -(Synchro) northern leg "Union Day School" link should have a min of 1,000'
5	-BWI does not include the 75' southbound right-turn lane recommended in the TIA

Signal Plans and Timings

Node # (scenario)	Signal Plan Timing/Phasing/Detector Comments
2 (existing)	-NOTE only utilized min initial from the signal plan (all other timing settings were NCDOT recommended timing settings & mentioned in the report) -Should be min recall on phase 2 & 6 not max -Phase 1 should be the lagging phase
2 (no-build)	
2 (build)	-changed the WB phase from phase 4 (existing & no-build) to phase 8

Document Comments:

- Page 21-24 – Matthews Weddington Rd & Chestnut Ln:
 - WBR & SBL 95% & Max queues exceed storages under No-Build & Build/BWI
 - Heavy queueing experienced at this intersection
 - Did not provide flow-scale analysis reports for the roundabout in the Appendix, only screenshots in the report.
- Page 25-27 – Matthews Weddington Rd & Antioch Church Rd/Access A:
 - Table 8 – Even with the suggested improvements at this intersection, the increase in delay on the SB approach is 53% and the LOS degrades by one level (C to D) during the AM (based on the comparison of no-build and BWI).
 - Based on NCDOT and Stallings guidelines, there should be additional mitigation for dropping one level and the increase in delay greater than 25%
 - Table 9 – Even with the suggested improvements at this intersection, heavy queueing is still expected and the 95% and/or Max queues exceed storage for ALL turn lanes (except for the EBR) under BWI conditions.
 - Based on NCDOT and Stallings guidelines, there should be additional mitigation for 95th and/or Max queues (whichever is higher) exceeding storage
 - No Internal Protected Stem (IPS) length was recommended along Access A [NCDOT requirement].
- Page 28 & 29 – Matthews Weddington Rd & Brayland Ave/Access B:

- Table 10 – The NB approach LOS degrades by one level (B to C) during the AM (based on the comparison of no-build to build).
 - Based on NCDOT and Stallings guidelines, there should be additional mitigation for dropping one level
 - The first sentence on page 29 should indicate “LOS C during AM and LOS B during PM” not LOS C during both.
 - Table 11 – Queues were not reported for the EB & WB approaches along Matthews Weddington Road. Heavy queueing experienced on the EB & WB approaches due to issues at adjacent intersections.
 - Heavy queueing experienced along the SB approach (368’) during 2027 BWI AM (even with the improvements at Int 2).
 - No Internal Protected Stem (IPS) length was recommended along Access B [NCDOT requirement].
- Page 30-32 – Matthews Weddington Rd/Tilley Morris Rd & Union Day School/Weddington Matthews Rd:
- Table 12 – Even with the TEST improvements at this intersection, the increase in delay on the SB approach is 34% and the LOS degrades by one level (D to E) during the AM (based on the comparison of no-build and Build with TEST improv).
 - Based on NCDOT and Stallings guidelines, there should be additional mitigation for dropping one level and the increase in delay greater than 25%.
 - *Note: ALL 2027 Build/BWI max queues are from the BWI SimTraffic reports (this includes improvements at Int 2)*
 - Minimal increase in queues when comparing Build/BWI and No-Build, with the exception of the EB LT/TH queue increase during the PM peak hour
 - 95% increased 191’ and max increased 365’ during the PM
 - EBR, WBL, and NBR Max queues exceed storage under No-Build & Build/BWI
 - SBR Max queue exceeds storage under Build/BWI AM
 - Based on NCDOT guidelines, there should be additional mitigation for 95th and/or **Max** queues (whichever is higher) exceeding storage.
 - Heavy queueing experienced on the WB TH-R during AM and EB TH-R during PM (even with the improvements at Int 2).
 - Based on SimTraffic simulations it looks like the Roundabout is not operating as it would in the field due to the dual circulating lanes (programmed in Synchro) and the turn lanes.
 - Did not provide flow-scale analysis report for the roundabout in the Appendix, only screenshot in the report.
- Page 33 – Matthews Weddington Rd & Access C:

- The report recommended a 75' SBR along Matthews Weddington Road (warranted) but the BWI synchro did not include this improvement.
- Table 16 – Queues were not reported for the NB & SB approaches along Matthews Weddington Road. Heavy queueing experienced on the SB approach lane due to issues at adjacent intersections.
- Heavy queueing experienced along the EB approach (255') during 2027 BWI AM (even with the improvements at Int 2).
- No Internal Protected Stem (IPS) length was recommended along Access C [NCDOT requirement].
- *Note that the 2032 Build +5 analysis included the 2027 BWI improvements and optimized timings at Int 2 but **NOT** the recommended 75' SBR at this intersection).*

SimTraffic Queueing Comments

- Did not provide SimTraffic Queueing reports for Existing (2025), Build (2027), and Build (2032) scenarios in the report or Appendix.
- No-Build AM:
 - SimTraffic shows grid lock along Matthews Weddington Road (traveling southwest)
 - This results in heavy queueing along Chestnut Lane and Antioch Church Road
- No-Build PM:
 - SimTraffic shows heavy queueing at Int 2 (signal) backing into adjacent intersections along Matthews Weddington Road
 - This results in heavy queueing along the SB approach at Int 1 (RAB) and the EB approach at Int 3 (RIRO)
 - SimTraffic shows heavy queueing on the EB approach at Int 4 (RAB)
 - Same SimTraffic simulations comment about the roundabouts.
- 2027 BWI AM:
 - This scenario includes the improvements at Int 2 but **not** the recommended WBR (100') at Access B & the SBR (75') at Access C.
 - SimTraffic shows grid lock along Matthews Weddington Road (traveling southwest) likely due to the heavy queueing along the WB approach at Int 4 (RAB).
 - This results in heavy queueing at adjacent intersections.
 - Same SimTraffic simulations comment about the roundabouts.
- 2027 BWI PM:
 - This scenario includes the improvements at Int 2 but not the recommended WBR (100') at Access B & the SBR (75') at Access C.

- SimTraffic shows heavy queueing along the SB approach at Int 1 (RAB) and the EB approach at Int 4 (RAB).
- Same SimTraffic simulations comment about the roundabouts.

Appendix Comments:

- The Appendix needs to include the following:
 - The updated NCHRP Internal Capture Spreadsheet
 - SimTraffic reports for all scenarios
 - Flow-Scale analysis reports from SIDRA

Chelsey Brooks

From: Randy Goddard
Sent: Friday, June 6, 2025 1:12 PM
To: Helms, Amelia C
Cc: Gardner, Zachary L; Lee, Tou Y; Kevin Parker; Max Hsiang; Obregon, Felix A; Michael Wickline; Chelsey Brooks
Subject: The Cottage Green TIA ~ Review Response to NCDOT Comments [Filed 06 Jun 2025 13:27]
Attachments: Int 1.pdf; A.pdf; Int 2.pdf; 5.14.25 Trip Generation Table.pdf; Int 4.pdf
Categories: Cottage Green, Filed by Mail Manager

Amelia,

Good afternoon and in response, we would like to provide the following:

- **Matthews-Weddington Rd & Chestnut Ln (RAB):**

- Our client (petitioner/developer) has agreed to the additional improvement to the RAB as we had noted as “tested” in the original TIA submittal and as you have also indicated would be considered by NCDOT.
- This results in the overall intersection operating significantly better when compared to the future no-build scenario (see first attachment – Intersection 1):
 - 2027 No-Build Conditions
 - AM - LOS C/16.4 sec delay/0.89 v/c
 - PM - LOS A/8.0 sec delay/0.57 v/c
 - 2027 Build w/Improvements
 - AM - LOS B/13.7 sec delay/0.71 v/c
 - PM - LOS A/8.2 sec delay/0.46 v/c
- We have also prepared the corresponding requested concept plan for this improvement (see second attachment – Exhibit A).

- **Matthews-Weddington Rd & Antioch Church Rd (signal):**

- To also summarize our originally suggested improvements per the TIA for this intersection:
 - Construct a northbound right turn lane with 225 feet of storage on Matthews-Weddington Road
 - Construct a southbound right turn lane (originally 175’ of storage revised to a drop-right with the above noted Chestnut RAB improvement)
 - These are in addition to the proposed access with three existing lanes.
- This results in the overall intersection operating even better when compared to the future no-build scenario (see third attachment – Intersection 2):
 - 2027 No Build Conditions
 - AM - LOS E/65.4 sec delay/1.08 v/c
 - PM - LOS E/68.9 sec delay/1.09 v/c
 - 2027 Build w/Improvements
 - AM - LOS E/61.1 sec delay/1.06 v/c
 - PM - LOS D/51.4 sec delay/0.94 v/c

- **Matthews Weddington Rd & Tilley Morris Rd (RAB):**

- In our TIA, we did not suggest any improvements as only EB Tilley Morris dropped from a LOS D to LOS E in the PM peak
 - Overall intersection LOS remained LOS F in the AM and LOS C in the PM
 - In addition, the actual increase in overall intersection delay is only 4.5 seconds
 - The actual increase in the eastbound approach delay is only 11.6 seconds
- We do not feel there is any reasonable improvement that fully mitigates our impact on the one approach during the one peak hour
- Please note that the site is now proposing a reduction in retail SF (from 32,700 SF to 19,100 SF) and the estimated trips based on this reduction are provided (see fourth attachment – Trip Gen Table).
- With that reduction, we have updated the analysis which indicate the following overall intersection results. While this may only show a slight improvement, the results for the EB approach for the PM peak (original approach that showed a LOS drop) are also noted below for each analysis scenario (see fifth attachment – Intersection 4):
 - 2027 No Build
 - AM - LOS F/59.6 sec delay/1.28 v/c
 - PM - LOS C/15.1 sec delay/0.87 v/c
 - EB Approach - LOS D/26.2 sec delay
 - 2027 Build
 - AM - LOS F/67.2 sec delay/1.34 v/c
 - PM - LOS C/19.6 sec delay/0.95 v/c
 - EB Approach - LOS E/37.8 sec delay
 - 2027 Build w/Reduced Retail SF (NEW TEST)
 - AM - LOS F/66.8 sec delay/1.33 v/c
 - PM - LOS C/18.5 sec delay/0.94 v/c
 - EB Approach - LOS E/35.1 sec delay (where the cut-off on LOS D to LOS E is 35.0 sec)

We feel that the significant improvements at the Chestnut RAB and the signalized intersection at Antioch Church should be considered adequate and would offset the minor impacts to the Tilley Morris RAB.

Based on the above, we would ask for NCDOT and Stallings reconsideration of the need for any mitigation beyond what is now being committed to by the petitioner/developer.

Let us know if you have any questions and we look forward to our continued cooperation to reach an overall mitigation solution/improvement plan that can be agreed to by all parties.

Thank you,

RANDY E. GODDARD > **PE** senior principal
P 704.343.0608 x313 M 704.654.9619

From: Helms, Amelia C <achelms@ncdot.gov>

Sent: Tuesday, June 3, 2025 4:24 PM

To: Kevin Parker <kparker@stallingsnc.org>; Randy Goddard <randy@drgrp.com>; Gardner, Zachary L

<zlgardner@ncdot.gov>

Cc: Lee, Tou Y <tylee@ncdot.gov>; Michael Wickline <Michael@drgrp.com>; Chelsey Brooks <Chelsey@drgrp.com>; Aaron Cook <aaron.cook@bolton-menk.com>; Russell, Justin T <jrussell@stallingsnc.org>; Max Hsiang <mhsiang@stallingsnc.org>

Subject: RE: [External] The Cottage Green TIA ~ Request for RAB "Brainstorming" Session

Randy,

NCDOT has the following comments:

- Matthews Weddington Rd/Chestnut Ln RAB
 - Mitigation is necessary at this roundabout.
 - NCDOT is willing to consider the following tested improvements at this intersection:
 - Construct a second southbound receiving lane on Matthews Weddington Road to terminate as a right turn lane at Access "A"
 - Modify the southbound approach channelizing median to allow a second circulating lane on the north side of the roundabout
 - Please provide concept.
- Matthews Weddington Rd/Tilley Morris Rd RAB
 - Mitigation is necessary at this roundabout.
 - NCDOT is willing to review the potential of adding a second circulating lane and possibly a westbound receiving lane.

Thank you,

Amelia Helms, P.E.

District Engineer

Division 10 - District 3

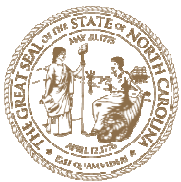
North Carolina Department of Transportation

704 218 5100 office

704 292 1800 fax

achelms@ncdot.gov

130 South Sutherland Avenue
Monroe, NC 28112



Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

From: Kevin Parker <kparker@stallingsnc.org>

Sent: Tuesday, May 27, 2025 12:17 PM

To: Randy Goddard <randy@drgrp.com>; Gardner, Zachary L <zlgardner@ncdot.gov>; Helms, Amelia C <achelms@ncdot.gov>

Cc: Lee, Tou Y <tylee@ncdot.gov>; Michael Wickline <Michael@drgrp.com>; Chelsey Brooks <Chelsey@drgrp.com>; Aaron Cook <aaron.cook@bolton-menk.com>; Russell, Justin T <jrussell@stallingsnc.org>; Max Hsiang



NCDOT Traffic Impact Analysis Need Screening / Scoping Request



TIA Need
Screening



TIA
Scoping



TIA
Submittal

A Traffic Impact Analysis (TIA) may be required for developments based on the site trip generation estimates, site context, or at the discretion of the NCDOT District Engineer. The Applicant or the TIA Consultant shall submit this form along with the site plan to the District Engineer to determine the TIA need and, if a TIA is required, initiate the TIA scoping process. Without an approved scope, the TIA is incomplete and will be rejected until the study is revised to conform to NCDOT's TIA requirements.

Project Name: The Cottage Green **Previous Name:** If Applicable _____
Location: Antioch Ch Rd & Matthews -Weddington Rd **County:** Union **Municipality:** Stallings
Project Description: Mixed-use project with a majority multi-family low-rise and some townhomes with a mix of retail And retsurant land uses.

Project Contact: Applicant
 Company Name HMF Americana, LLC
 Contact Person Timothy Crawford
 Phone Number 704-904-4745
 Email cfw926@gmail.com
 Mailing Address PO Box 7862
The Woodlands, TX 77387

TIA Consultant
Design Resource Group
Randy E Goddard, PE
704.343.0608
randy@drgrp.com
1111 Hawthorne Lane
Charlotte, NC 28205

Site Plan Prepared By: SeamonWhiteside
 See site plan/vicinity map requirements on page 2.
Parcel Size: 38.62 Acre(s)

Site Plan Date: 2/17/2025
Anticipated Build-Out Year: 2027

Weekday Site Trip Generation - Do NOT adjust for mode split, pass-by, internal capture, or diverted trips.

ITE LUC	Proposed Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
215	Single-Family Attached	21	DU's	110	Adj. Street	1	4	5	5	4	9	ITE Equation
220	Multi-Family Attached (Low)	201	DU's	1,364	Adj. Street	20	65	85	67	40	107	ITE Equation
822	Strip Retail	32,700	SF	1,781	Adj. Street	46	31	77	108	107	215	ITE Rate
932	High-Turn Sit-Down Rest	10.900	SF	1,168	Generator	85	64	149	91	87	178	ITE Rate
Total				4,423		152	164	316	271	238	509	

Refer to the current [NCDOT Congestion Management Capacity Analysis Guidelines](#) for acceptable trip calculation methods and data sources.

**Explain local or other data sources, if used: _____

- ☒ The estimated site trips meet NCDOT's TIA trip threshold of 3,000 daily trips.
- ☒ The estimated site trips meet the municipal TIA trip threshold of Stallings: 1,000 daily and 100 peak hour
- ☐ This project is located in a known [STIP](#) and/ or local CIP project # _____
- ☒ This project includes a rezoning request.
- ☐ The proposed site access is located within 1,000 feet of an interchange.
- ☐ The Applicant requests for a new or modified control-of-access break.
- ☐ The Applicant requests for a new or modified median break.

Applicant's Signature

Print Name

Date



NCDOT Traffic Impact Analysis Need Screening / Scoping Request

TIA Need
Screening



TIA
Scoping



TIA
Submittal



Site Plan/Vicinity Map Requirement for TIA Need Screening: While the site plan may not be finalized during the TIA scoping stage, the graphic representation of the proposed development shall provide adequate details on the development scope and context. More specifically, the site plan/map shall clearly show the location and type of each access point, spacing to adjacent and opposing driveways or intersections, internal street network, proposed buildings/parcels with their anticipated uses and sizes at full build-out and, if applicable, any nearby interstate, US, NC or Secondary Roads (SR).

Project Name: The Cottage Green

Project Reference Number: 1134-001

- ☐ **A TIA is Required by the Local Government.** In addition, the study area is expected to include NCDOT maintained transportation facilities.
- ☐ **A TIA is Required by NCDOT,** per the [Policy on Street and Driveway Access to North Carolina Highways](#).

If either or both of the boxes above are checked, the Applicant/TIA Consultant is hereby requested to fill out as much as possible of the following TIA scoping checklist, and return it along with the supporting documents to NCDOT prior to the scoping meeting.

- ☐ **A TIA is NOT required.** This decision is based on the development information presented above. Changes in the development plan will require re-evaluation of the TIA need, and may necessitate a TIA. The Applicant should inform the District Engineer of any significant changes in a timely fashion to avoid delays or rejections of the driveway permit / encroachment agreement applications.

Additional Comments:

The TIA need decision is made by the NCDOT Division _____ District _____ on _____.

NCDOT District Representative's Signature

Email concurrence may be used in lieu of the signature.

Print Name



NCDOT TIA Scoping Checklist



Project Name: The Cottage Green

TIA Scoping Date: 02/17/25

☒ TIA Need Screening Forms are Attached. Project Reference #: _____ Decision Date: _____

☒ Site Plan and Access

☒ Provide a site plan illustrating site access, internal and external roadways, buildings and land uses.

Refer to NCDOT's [Policy on Street and Driveway Access to North Carolina Highways](#) pages 14 and 15 for site plan requirements.

☒ Identify site access.

New Access	On Road	Access Type		Driveway Spacing		
	Road Name	Permitted Movements	Traffic Control	Distance (ft)	Direction	Nearest Intersection / Access
Access A	Matthews-Wedd Rd	Conventional Full-Mvmt	Signal	0		At Antioch Church Road
Access B	Matthews-Wedd Rd	RIRO	2-Way Stop	0		At Brayland Avenue
Access C	Matthews-Wedd Rd	RIRO	2-Way Stop	650	North	Antioch Church Road
Access D						
Access E						
Access F						
Access G						
Access H						

Existing Access	Existing Intersection of		Access Modification	Proposed Interconnectivity (If Applicable)		
	Road A	Road B		Connector #	Road Connected	Adjacent Development
Access 1			Please Select	Connector 1		
Access 2				Connector 2		
Access 3				Connector 3		
Access 4				Connector 4		

☐ Additional access clarifications and provisions (e.g., proposed control-of-access or median breaks, modifications of existing access, loading/unloading area access, bike/pedestrian accommodation).

☐

Proposed K-12 School Site

☐ NCDOT [MSTA School Traffic Calculator](#) for Select School Type shall be used.

☐ Peak Hour Factors (PHFs) shall be adjusted/weighted for new school trips (0.5 PHF by default).

☐ Internal school circulation analysis is required, and should be submitted in advance or concurrent with the TIA submittal.

☐ Clarify traffic operation plans (e.g. traffic circulation pattern, pedestrian access, drop-off/pick-up zone location and configuration, queue storage area and, if applicable, staggered start times).



NCDOT TIA Scoping Checklist

TIA Need
Screening



TIA
Scoping



TIA
Submittal



☒ Trip Generation

The TIA Consultant shall prepare trip generation estimates following the current [NCDOT Congestion Management Capacity Analysis Guidelines](#), and submit the calculation sheets and supporting information to the District Engineer for approval prior to capacity analysis.

ITE LUC	Proposed Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
215	Single-Family Attached	21	DU's	110	Adj. Street	1	4	5	5	4	9	ITE Equation
220	Multi-Family Attached (Low)	201	DU's	1,364	Adj. Street	20	65	85	67	40	107	ITE Equation
822	Strip Retail	32,700	SF	1,781	Adj. Street	46	31	77	108	107	215	ITE Equation
932	High-Turn Sit-Down Rest	10,900	SF	1,168	Adj. Street	85	64	149	91	87	178	ITE Equation
Unadjusted Site Trips				4,423		152	164	316	271	238	509	
Internal Capture Trips (Attach Calculation Sheets)						-22	-23	-45	-68	-68	-136	NCHRP 684
Internal Capture % of Unadjusted Site Trips				%		%			%			
LUC	Proposed Land Use	Any Internal Trips?		Pass-By % of External Trips								
932	High-turn Sit-Down Rest	Yes - Adjust External Trips		0 %		0 %			43 %			Please Select
				%		%			%			
				%		%			%			
				%		%			%			
				%		%			%			
Pass-By Trips (Attach Calculation Sheets)				-49		0	0	0	-25	-24	-49	
Adjacent Street Volumes												Please Select
Non-Pass-By Primary Trips				4,374		130	141	271	178	146	324	
Diverted Trips, if Applicable and Justifiable												Please Select

**Explain local or other data sources, if used:

☐ Existing Site Trip Information for Redevelopment Projects (Attach separate sheets as needed)

ITE LUC	Existing Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
					Please Select							Please Select
Total Existing Site Trips												



NCDOT TIA Scoping Checklist



☒ Trip Distribution

- ☐ Trip distribution diagrams are submitted concurrently with this document (attach separate sheets).
- ☒ Trip distribution diagrams will be submitted separately, along with supporting information, to the District Engineer for review and approval prior to capacity analysis. The trip distribution shall be based on the current and anticipated traffic patterns, as well as instructions noted below.

If required by the District Engineer, the following additional diagrams shall also be submitted:

- ☐ Mixed-Use Developments (separate diagrams for residential, commercial, and office trips)
- ☐ Inter-Development Trips (if 'internal' trips cross public streets)
- ☒ Pass-By Trips
- ☐ Diverted Trips
- ☐ Each Analysis Period

☐ Mode Split

- ☐ Provide Data Source and Justification

Mode Period	Auto		
AM Peak	%	%	%
PM Peak	%	%	%
Daily	%	%	%
	%	%	%

- ☐ Identify proper infrastructure and accommodation for other modes of travel.

☒ Analysis Peak Periods:

- ☒ Weekday AM Peak 7-9 AM
- ☒ Weekday PM Peak 4-6 PM
- ☐ Weekday Midday Peak _____
- ☒ Weekday PM School Peak 2-4 PM (Union Day School and Antioch Elementary School)
- ☐ Weekend _____ Peak _____
- ☐ Other _____



NCDOT TIA Scoping Checklist



☒ Study Area Intersections and Data Collection

The study area shall include the site access intersections (both new and existing) identified under “Site Plan and Access” on page 1, as well as the following external and, if applicable, internal intersections.

External Intersection	Intersection of		Traffic Control	Intersection Turning Movement Counts			Notes
	Road A	Road B		New / Existing	Date of Counts	Growth Adjustment	
#1	Matthews-Wedd Rd	Chestnut Lane	Yield	Require New Counts			Roundabout
#2	Matthews-Wedd Rd	Antioch Church Rd	Signal	Require New Counts			
#3	Matthews-Wedd Rd	Brayland Avenue	2-Way Stop	Require New Counts			
#4	Matthews-Wedd Rd	Tilley Morris Road	Yield	Require New Counts			Roundabout
#5							
#6							
#7							
#8							
#9							
#10							
#11							
#12							

Internal Intersection	Intersection of		Access Type		Intersection Spacing		
	Road A	Road B	Traffic Control	Permitted Movements	Distance (ft)	Direction	Nearest Intersection
#101			Please Select	Please Select		Please Select	
#102							
#103							
#104							
#105							

The following data will be collected:

- ☒ New traffic turning movement counts in ☒ 15-min intervals ☐ 5-min intervals (near schools)
Unless otherwise noted above, new traffic counts shall be collected at the existing study intersections during the analysis periods. Weekday counts shall avoid Mondays, Fridays, holidays, school breaks, road closures, and major weather events.
- ☐ To account for the impact of existing and/or proposed school traffic, PHFs will be adjusted for:
intersections numbered: _____
and access points numbered: _____
- ☐ Traffic Forecast Data for TIP: _____
- ☒ Roadway/Intersection Configuration & Traffic Control
- ☒ Traffic Signal Phasing & Timing Data
- ☐ Crash Data: _____ Period: _____
- ☐ Other: _____



NCDOT TIA Scoping Checklist



☒ Future Year Conditions

☒ Project Build-Out Year: 2027

☒ Future Analysis Year(s): 2032 (2027 +5) Stallings Requirement

☐ Identify below any funded/committed future transportation improvements, as well as any approved but incomplete developments near the site.

Funded STIP / Local CIP Project	Project Description		Year Complete
	Please Provide		
Nearby Approved Development	Location	Future Land Use (exclude any completed phases)	Committed Improvements
Please Provide			

☒ Annual Growth Factor: 2 %

Justification/Data Source: Calculated Historical AADT

☐ Local Comprehensive Transportation Plan Compliance

☐ Identify Applicable Local Transportation Planning Documents

☒ Identify Applicable Roadways inside the Study Area

Road Name	Classification	Speed Limit	Proposed Cross-Section	Proposed Right-of-Way	Compliance Requirements	Affect Study Intersection #
Matthews-Wedd Rd	Minor Arterial	45				1-5
Antioch Church Rd	Minor Collector	45				2
Chestnut Lane	Minor Collector	45				1
Tilley Morris Road	Major Collector	45				4



NCDOT TIA Scoping Checklist



☒ Study Method

The traffic analysis shall follow the current [NCDOT Congestion Management Capacity Analysis Guidelines](#), [Policy on Street and Driveway Access to North Carolina Highways](#), and use the current approved version of analysis software (e.g. Synchro/SimTraffic, HCS, Sidra Intersection, TransModeler).

The study shall include the following analysis scenarios for each analysis period.

1. Existing Conditions
2. Future No-Build Conditions (existing + background growth + approved developments + committed or funded improvements)
3. Future Build Conditions (future no-build + site trips)
4. Future Build with Improvements Conditions (future build traffic with improvements to mitigate the proposed development's impacts) and, if applicable:
- ☐ 5. TIP Design Year Analysis _____
- ☐ 6. Alternative Access Scenario (without proposed control-of-access or median break / modification)

The following additional analysis/outputs should be provided as warranted:

- ☐ Signal Warrant Analysis for accesses/intersections _____
- ☐ Multi-Modal Level of Service Analysis
- ☐ School Loading Zone Traffic Simulation
- ☐ Phasing Analysis (scope separately as needed)
- ☐ Safety/Crash Analysis
- ☐ Control-of-Access Modification Justification
- ☐ Median Break / Modification Justification
- ☐ Other _____

☒ Submittals

In addition to the hardcopies required below, the TIA Consultant shall provide the District Engineer and, if required, the local government an electronic copy of the study documents, including the latest site plan, figures and appendices, in searchable PDF files and the original traffic analysis files (e.g., Synchro, HCS).

To expedite review, the NCDOT electronic submittals shall also be delivered concurrently to:

☒ Div. Traffic Engr ☐ Regional Traffic Engr ☐ Congestion Management ☒ Other _____

Submittals	NCDOT		Local Government	
	Electronic	Hardcopy	Electronic	Hardcopy
Trip Generation & Distribution	Required		Please Select	
Draft TIA Report	Required			
Final Sealed TIA Report	Required			

☐ **Additional Comments** (municipal TIA requirements, approved variations from NCDOT guidelines)



NCDOT TIA Scoping Checklist

TIA Need
Screening

TIA
Scoping

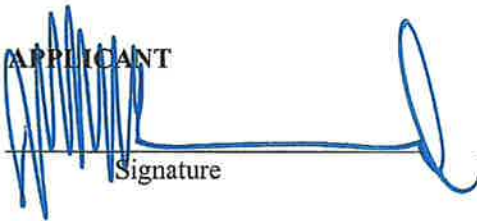
TIA
Submittal



Agreement by All Parties

The undersigned agree to the contents and methodology described above for completing the required traffic impact analysis for the proposed development identified herein. Any changes to the above methodology contemplated by the Applicant or the TIA Consultant must be submitted to the District Engineer in writing. If approved by NCDOT, then such changes may be accepted for the TIA report. Subsequent revisions to the development plan (e.g. land use, density, site access, or schedule) may require additional scoping and analysis, and may modify the TIA requirements.

This agreement shall become effective on the date approved by NCDOT, and shall expire ____ months after the effective date or upon significant changes to the roadway network and/or development assumptions, whichever occurs first. Once expired, renewal or re-scoping will be required for subsequent TIA submittals.

APPLICANT

Signature

TIMOTHY CRAWFORD
Print Name

1/14/25
Date

TIA CONSULTANT


Signature

Randy E. Goddard, PE
Print Name

1/15/2025
Date

LOCAL GOVERNMENT REPRESENTATIVE (If Applicable)

Signature

Print Name

Date

Email concurrence may be used in lieu of the signature.

NCDOT DISTRICT REPRESENTATIVE

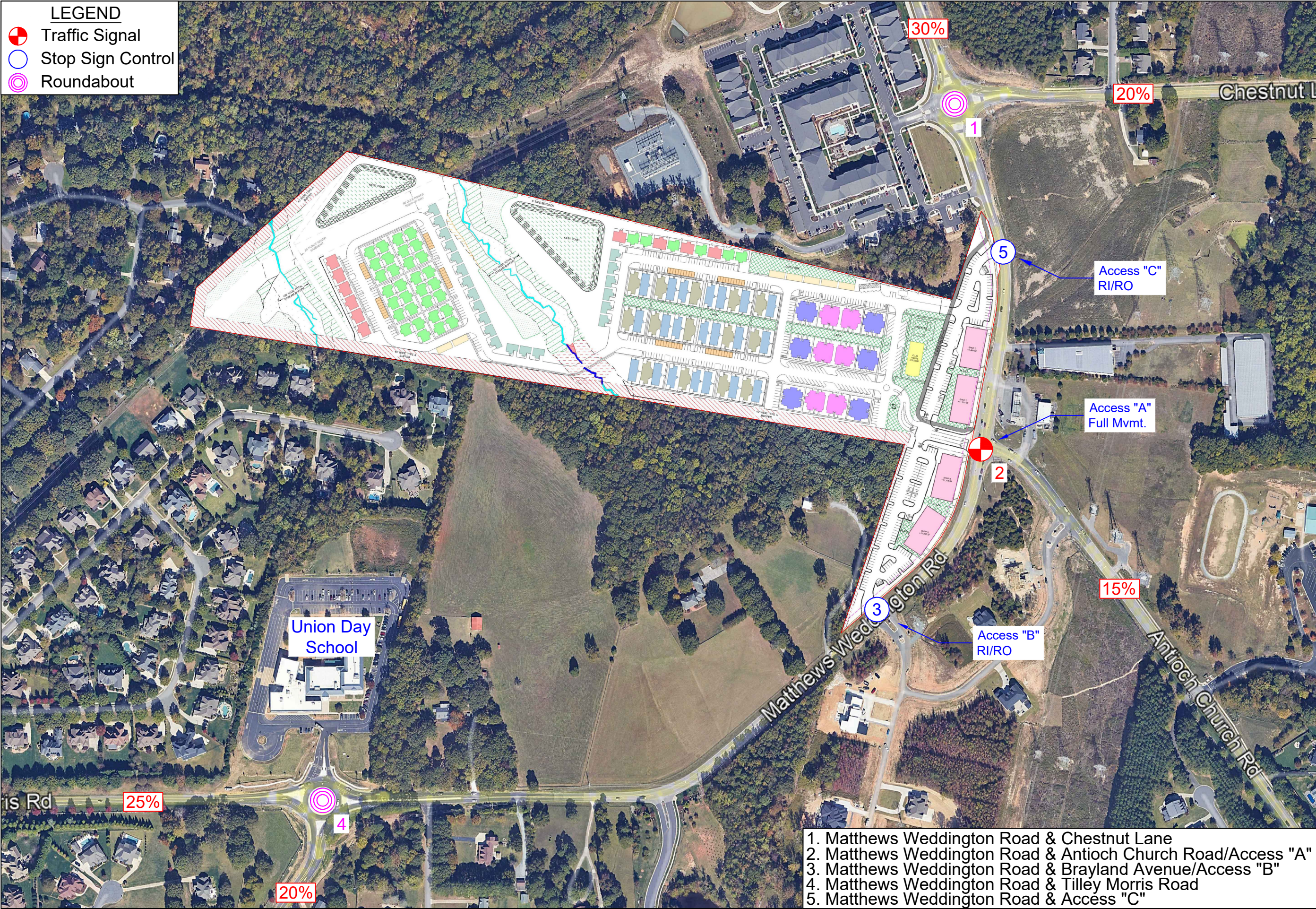
Reviewed and approved by the NCDOT Division ____ District ____ on ____.

Signature
Email concurrence may be used in lieu of the signature.

Print Name

LEGEND

- Traffic Signal
- Stop Sign Control
- Roundabout



1. Matthews Weddington Road & Chestnut Lane
2. Matthews Weddington Road & Antioch Church Road/Access "A"
3. Matthews Weddington Road & Brayland Avenue/Access "B"
4. Matthews Weddington Road & Tilley Morris Road
5. Matthews Weddington Road & Access "C"

drG
**DESIGN
RESOURCE
GROUP**

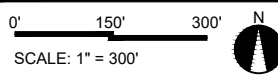
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING

2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
704.343.0608
www.drgroup.com

THE COTTAGE GREEN
STALLINGS, NORTH CAROLINA

HMF AMERICANA, LLC
PO BOX 7862
THE WOODLANDS, TX 77387

AREA OF
INFLUENCE MAP

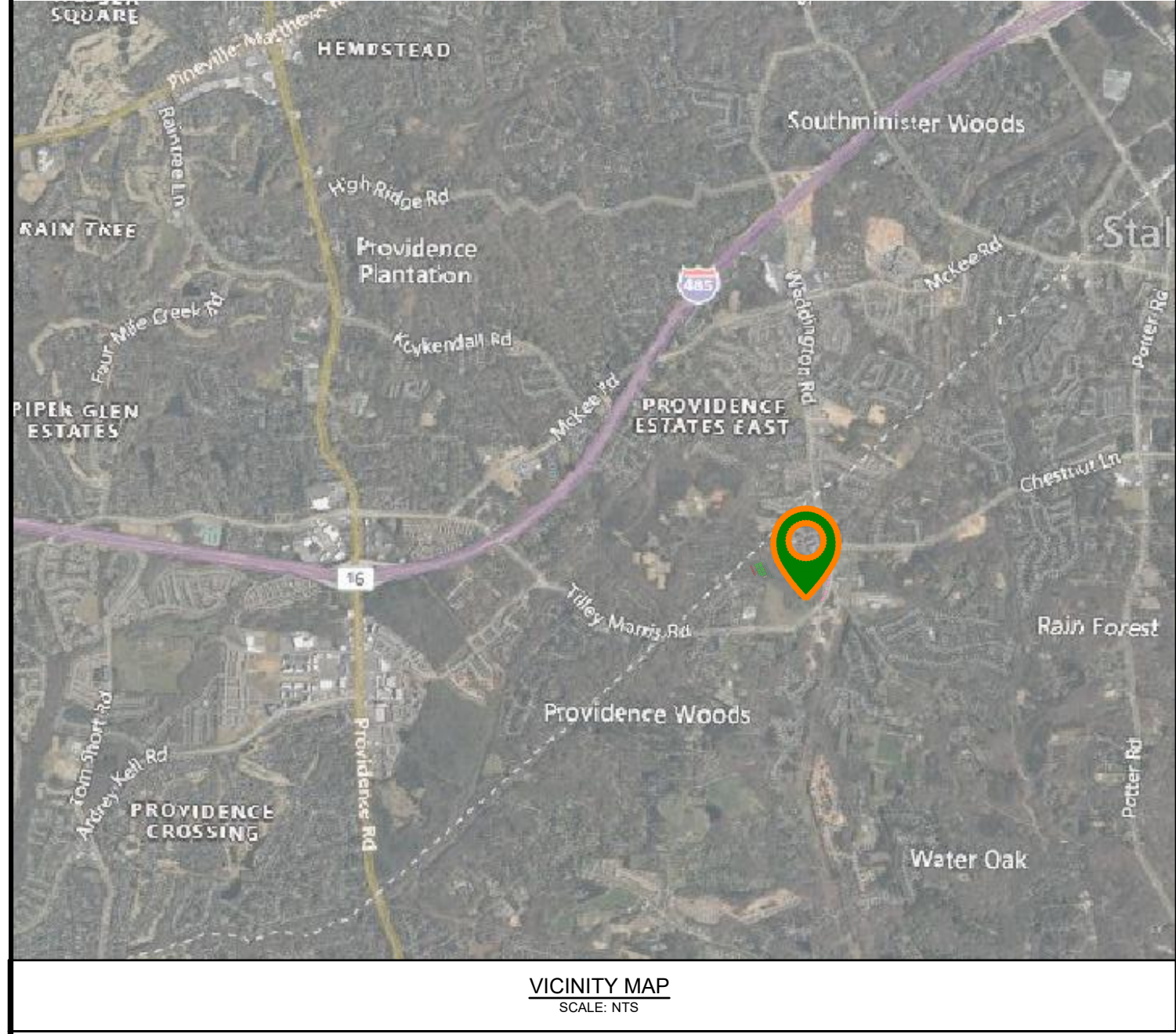


PROJECT #: 1134-001
DRAWN BY: PAH
CHECKED BY: REG

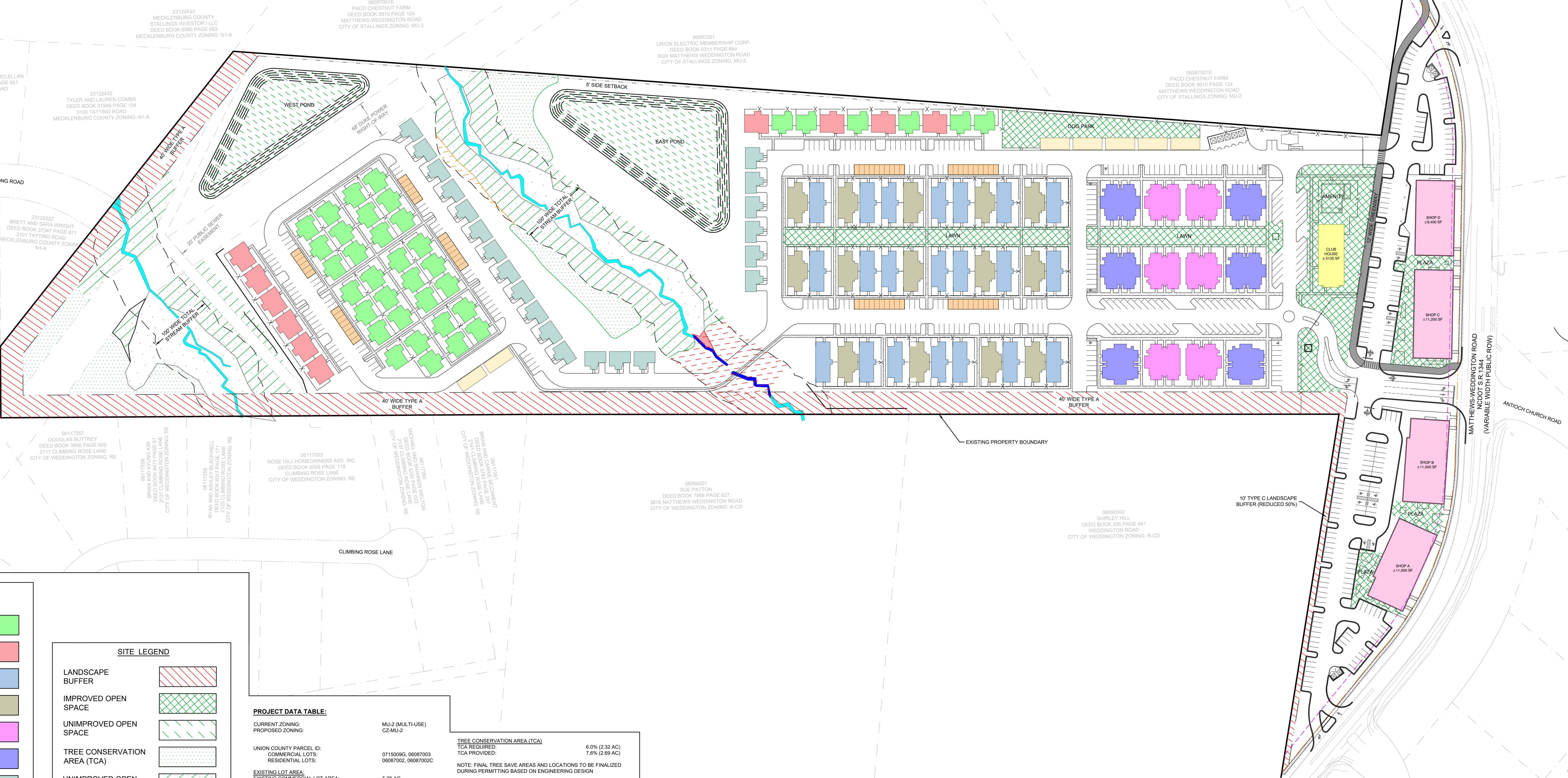
FEBRUARY 2025

REVISIONS:

Figure 1



VICINITY MAP
SCALE: NTS



UNIT LEGEND	
2 BED ROOM COTTAGE	
3 BED ROOM COTTAGE	
1 BEDROOM PATIO HOME	
2 BEDROOM PATIO HOME	
6-PLEX	
8-PLEX	
TOWNHOME	
CLUBHOUSE	
CARPORT	
GARAGE	
COMMERCIAL SHOPS	
SECURITY FENCE	— X — X —
PROPOSED RIGHT-OF-WAY	
BUILD-TO-LINE	

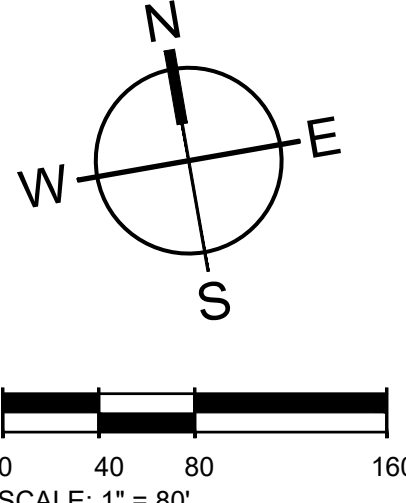
SITE LEGEND	
LANDSCAPE BUFFER	
IMPROVED OPEN SPACE	
UNIMPROVED OPEN SPACE	
TREE CONSERVATION AREA (TCA)	
UNIMPROVED OPEN SPACE & TCA	
CONCRETE SIDEWALK	
ASPHALT GREENWAY	
EXISTING WETLAND	
DISTURBED WETLAND	
EXISTING STREAM	
DISTURBED STREAM	
TEMP. DISTURBED STREAM BUFFER	

PROJECT DATA TABLE:

CURRENT ZONING:	MU-2 (MULTI-USE)
PROPOSED ZONING:	CZ-MU-2
UNION COUNTY PARCEL ID:	07150095, 06087003
COMMERCIAL LOTS:	06087002, 06087002C
RESIDENTIAL LOTS:	
EXISTING LOT AREA:	5.28 AC
EXISTING COMMERCIAL LOT AREA:	30.44 AC
EXISTING RESIDENTIAL LOT AREA:	35.72 AC
TOTAL EXISTING LOT AREA:	
PROPOSED LOT AREA:	4.98 AC
PROP. COMMERCIAL LOT AREA:	30.44 AC
PROP. RESIDENTIAL LOT AREA:	35.42 AC
TOTAL PROP. LOT AREA:	
SETBACKS:	5'
SIDE SETBACK:	5'
REAR SETBACK:	5'
OPEN SPACE:	
RESIDENTIAL IMPROVED OPEN SPACE REQUIRED:	1.52 AC (5.0%)
RESIDENTIAL IMPROVED OPEN SPACE PROVIDED:	1.92 AC (6.3%)
LAWN:	0.73 AC
DOG PARK:	0.33 AC
AMENITY AREA:	0.73 AC
ENTRY AREA:	0.13 AC
COMMERCIAL IMPROVED OPEN SPACE REQUIRED:	0.25 AC (5.0%)
COMMERCIAL IMPROVED OPEN SPACE PROVIDED:	0.58 AC (11.6%)
PLAZA:	0.21 AC
GREENWAY:	0.21 AC
UNIMPROVED OPEN SPACE PROVIDED:	3.67 AC (10.4%)
STREAM BUFFER:	1.81 AC
WEST POND:	0.74 AC
EAST POND:	1.12 AC
OPEN SPACE REQUIRED:	3.54 AC (10%)
TOTAL OPEN SPACE PROVIDED:	5.93 AC (16.7%)

TREE CONSERVATION AREA (TCA)	6.0% (2.32 AC)
TCA REQUIRED:	7.6% (2.69 AC)
TCA PROVIDED:	
NOTE: FINAL TREE SAVE AREAS AND LOCATIONS TO BE FINALIZED DURING PERMITTING BASED ON ENGINEERING DESIGN	
STREAM BUFFER	
TOTAL AREA: 6.72 AC	
TEMPORARY DISTURBED AREA: 0.05 AC	
PERMANENT DISTURBED AREA: 2.17 AC (32.3%)	

WATERSHEDS	
TWELVE MILE CREEK: 1.17 AC (3.3%)	
SIX MILE CREEK: 34.25 AC (96.7%)	
PROPOSED BUA	
RESIDENTIAL: 7.58 AC (24.9%)	
COMMERCIAL: 4.15 AC (83.2%)	
WETLAND IMPACTS	
WETLAND: 415 SF (0.01 AC)	
STREAM: 177 LF, 692 SF (0.02 AC)	
PARKING COUNT:	
PARKING PROVIDED FOR RESIDENTIAL:	462 SPACES
PARKING PROVIDED FOR COMMERCIAL:	207 SPACES
RESIDENTIAL UNIT ANALYSIS:	
1-BR HOMES IN 6-PLEX BUILDINGS:	24 UNITS
2-BR HOMES IN 6-PLEX BUILDINGS:	12 UNITS
1-BR HOMES IN 6-PLEX BUILDINGS:	48 UNITS
1-BR PATIO HOMES:	42 UNITS
2-BR PATIO HOMES:	28 UNITS
2-BR COTTAGES:	37 UNITS
3-BR COTTAGES:	10 UNITS
TOWNHOMES:	21 UNITS
TOTAL UNITS:	222 UNITS



THE COTTAGE GREEN - STALLINGS
REZONING PLAN

HMF AMERICANA
STALLINGS, NORTH CAROLINA

SW+ PROJECT: 11408
DATE: 2/17/2025
DRAWN BY: ASB/JCH
CHECKED BY: TLL

REVISION HISTORY	



The Cottages Green Stallings

2/6/2025

Land Use [ITE Code]			Daily	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Single Family (Attached) Housing [215]	21	DUs	110	1	4	5	5	4	9
Multi-Family (Low-Rise) Housing [220]	201	DUs	1,364	20	65	85	67	40	107
Strip Retail [822]	32,700	SF	1,781	46	31	77	108	107	215
High-Turnover (Sit-Down) Restaurant [932]	10,900	SF	1,168	85	64	149	91	87	178
Subtotal Trips			4,423	152	164	316	271	238	509
<i>Internal Capture Reduction</i>			*	-22	-23	-45	-68	-68	-136
<i>Pass-By Reduction</i>			-49	0	0	0	-25	-24	-49
Total New Trips			4,374	130	141	271	178	146	324

References:

Trip Generation, 11th Edition, Institute of Transportation Engineers, Washington, DC. 2021.

*Internal capture reductions not applied to daily trips.

Pass-by for LUC 932 = 43% in PM peak.

1111 Hawthorne Lane
Charlotte, NC 28205

O 704.343.0608
W www.drgrp.com

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	PAH
Scenario Description:				Date:	1/9/2025
Analysis Year:				Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	32,700	SF	77	46	31
Restaurant	932	10,900	SF	149	85	64
Cinema/Entertainment				0		
Residential	215,220	222	DU	90	21	69
Hotel				0		
All Other Land Uses ²				0		
				316	152	164

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		4	0	0	0
Restaurant	0	4		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	15	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	348	168	180
Internal Capture Percentage	14%	15%	14%
External Vehicle-Trips ⁵	271	130	141
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	12%
Restaurant	20%	7%
Cinema/Entertainment	N/A	N/A
Residential	4%	21%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	PAH
Scenario Description:				Date:	1/9/2025
Analysis Year:				Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	32,700	SF	215	108	107
Restaurant	932	10,900	SF	178	91	87
Cinema/Entertainment				0		
Residential	215,220	222	DU	116	72	44
Hotel				0		
All Other Land Uses ²				0		
				509	271	238

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4000	4000		4000	
Retail					4000	
Restaurant					4000	
Cinema/Entertainment					4000	
Residential		4000	4000			
Hotel					4000	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		29	0	3	0
Restaurant	0	39		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	1	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	560	298	262
Internal Capture Percentage	27%	25%	29%
External Vehicle-Trips ⁵	373	203	170
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	34%	27%
Restaurant	30%	43%
Cinema/Entertainment	N/A	N/A
Residential	6%	4%
Hotel	N/A	N/A

¹ Land Use Codes (LUCs) from <i>Trip Generation Manual</i> , published by the Institute of Transportation Engineers.
² Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.
³ Enter trips assuming no transit or non-motorized trips (as assumed in ITE <i>Trip Generation Manual</i>).
⁴ Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be
⁵ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.
⁶ Person-Trips
*Indicates computation that has been rounded to the nearest whole number.
Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Weddington Matthews Road north of Antioch Church Rd

[illegible]

The Cottage Green Stallings

5/14/2025

Land Use [ITE Code]			Daily	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Updated Scope									
Single Family (Detached) Housing [210]	21	DUs	240	5	13	18	14	9	23
Single Family (Detached) Housing [210]	47	DUs	504	9	28	37	31	18	49
Single Family (Attached) Housing [215]	70	DUs	483	8	23	31	22	16	38
Multi-Family (Low-Rise) Housing [220]	84	DUs	614	12	37	49	36	21	57
Strip Retail [822]	32,700	SF	1,781	46	31	77	108	107	215
High-Turnover (Sit-Down) Restaurant [932]	10,900	SF	1,168	85	64	149	91	87	178
Subtotal Trips			4,790	165	196	361	302	258	560
Internal Capture Reduction			*	-27	-29	-56	-68	-68	-136
Pass-By Reduction			-49	0	0	0	-25	-24	-49
Total New Trips			4,741	138	167	305	209	166	375

References:

Trip Generation, 11th Edition, Institute of Transportation Engineers, Washington, DC. 2021.

*Internal capture reductions not applied to daily trips.

Pass-by for LUC 932 = 43% in PM peak.

Land Use [ITE Code]			Daily	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Updated - Reduced Retail									
Single Family (Detached) Housing [210]	21	DUs	240	5	13	18	14	9	23
Single Family (Detached) Housing [210]	47	DUs	504	9	28	37	31	18	49
Single Family (Attached) Housing [215]	70	DUs	483	8	23	31	22	16	38
Multi-Family (Low-Rise) Housing [220]	84	DUs	614	12	37	49	36	21	57
Strip Retail [822]	19,100	SF	1,040	27	18	45	63	63	126
High-Turnover (Sit-Down) Restaurant [932]	10,900	SF	1,168	85	64	149	91	87	178
Subtotal Trips			4,049	146	183	329	257	214	471
Internal Capture Reduction			*	-25	-25	-50	-56	-55	-111
Pass-By Reduction			-54	0	0	0	-31	-23	-54
Total New Trips			3,995	121	158	279	170	136	306

References:

Trip Generation, 11th Edition, Institute of Transportation Engineers, Washington, DC. 2021.

*Internal capture reductions not applied to daily trips.

Pass-by for LUC 932 = 43% in PM peak.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	PAH
Scenario Description:				Date:	1/9/2025
Analysis Year:				Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	32,700	SF	77	46	31
Restaurant	932	10,900	SF	149	85	64
Cinema/Entertainment				0		
Residential	210;215	222	DU	135	34	101
Hotel				0		
All Other Land Uses ²				0		
				361	165	196

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		4	0	1	0
Restaurant	0	4		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	19	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	397	182	215
Internal Capture Percentage	16%	17%	14%
External Vehicle-Trips ⁵	305	138	167
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	15%
Restaurant	24%	9%
Cinema/Entertainment	N/A	N/A
Residential	8%	18%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	PAH
Scenario Description:				Date:	1/9/2025
Analysis Year:				Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	32,700	SF	215	108	107
Restaurant	932	10,900	SF	178	91	87
Cinema/Entertainment				0		
Residential	210;215	222	DU	167	103	64
Hotel				0		
All Other Land Uses ²				0		
				560	302	258

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4000	4000		4000	
Retail					4000	
Restaurant					4000	
Cinema/Entertainment					4000	
Residential		4000	4000			
Hotel					4000	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		29	0	3	0
Restaurant	0	39		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	1	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	616	332	284
Internal Capture Percentage	24%	23%	26%
External Vehicle-Trips ⁵	424	234	190
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	34%	27%
Restaurant	30%	43%
Cinema/Entertainment	N/A	N/A
Residential	4%	3%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	CRB
Scenario Description:	Reduced Trip Gen			Date:	5/14/2025
Analysis Year:				Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	19,100	SF	45	27	18
Restaurant	932	10,900	SF	149	85	64
Cinema/Entertainment				0		
Residential	210;215	222	DU	135	34	101
Hotel				0		
All Other Land Uses ²				0		
				329	146	183

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		3	0	1	0
Restaurant	0	2		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	19	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	362	161	201
Internal Capture Percentage	15%	17%	14%
External Vehicle-Trips ⁵	279	121	158
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	20%
Restaurant	23%	6%
Cinema/Entertainment	N/A	N/A
Residential	8%	18%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Cottages Green Stallings			Organization:	DRG
Project Location:				Performed By:	CRB
Scenario Description:	Reduced Trip Gen			Date:	5/14/2025
Analysis Year:				Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	19,100	SF	126	63	63
Restaurant	932	10,900	SF	178	91	87
Cinema/Entertainment				0		
Residential	210;215	222	DU	167	103	64
Hotel				0		
All Other Land Uses ²				0		
				471	257	214

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office	1.10	0%	0%	1.10	0%	0%
Retail	1.10	0%	0%	1.10	0%	0%
Restaurant	1.10	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.10	0%	0%	1.10	0%	0%
Residential	1.10	0%	0%	1.10	0%	0%
Hotel	1.10	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.10	0%	0%	1.10	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4000	4000		4000	
Retail					4000	
Restaurant					4000	
Cinema/Entertainment					4000	
Residential		4000	4000			
Hotel					4000	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		20	0	2	0
Restaurant	0	35		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	1	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	517	282	235
Internal Capture Percentage	24%	22%	26%
External Vehicle-Trips ⁵	360	201	159
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	52%	32%
Restaurant	21%	39%
Cinema/Entertainment	N/A	N/A
Residential	4%	3%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

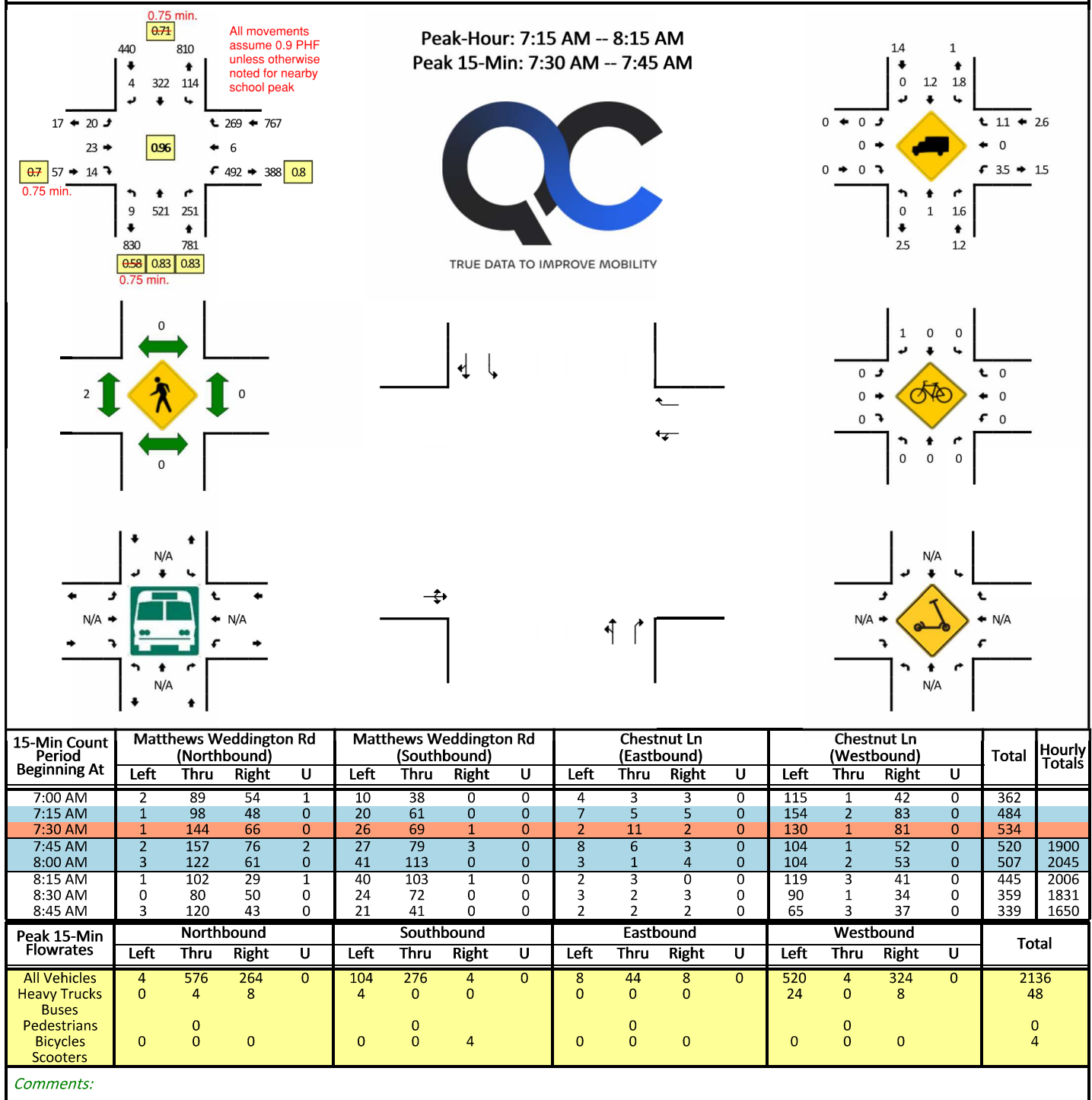
³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

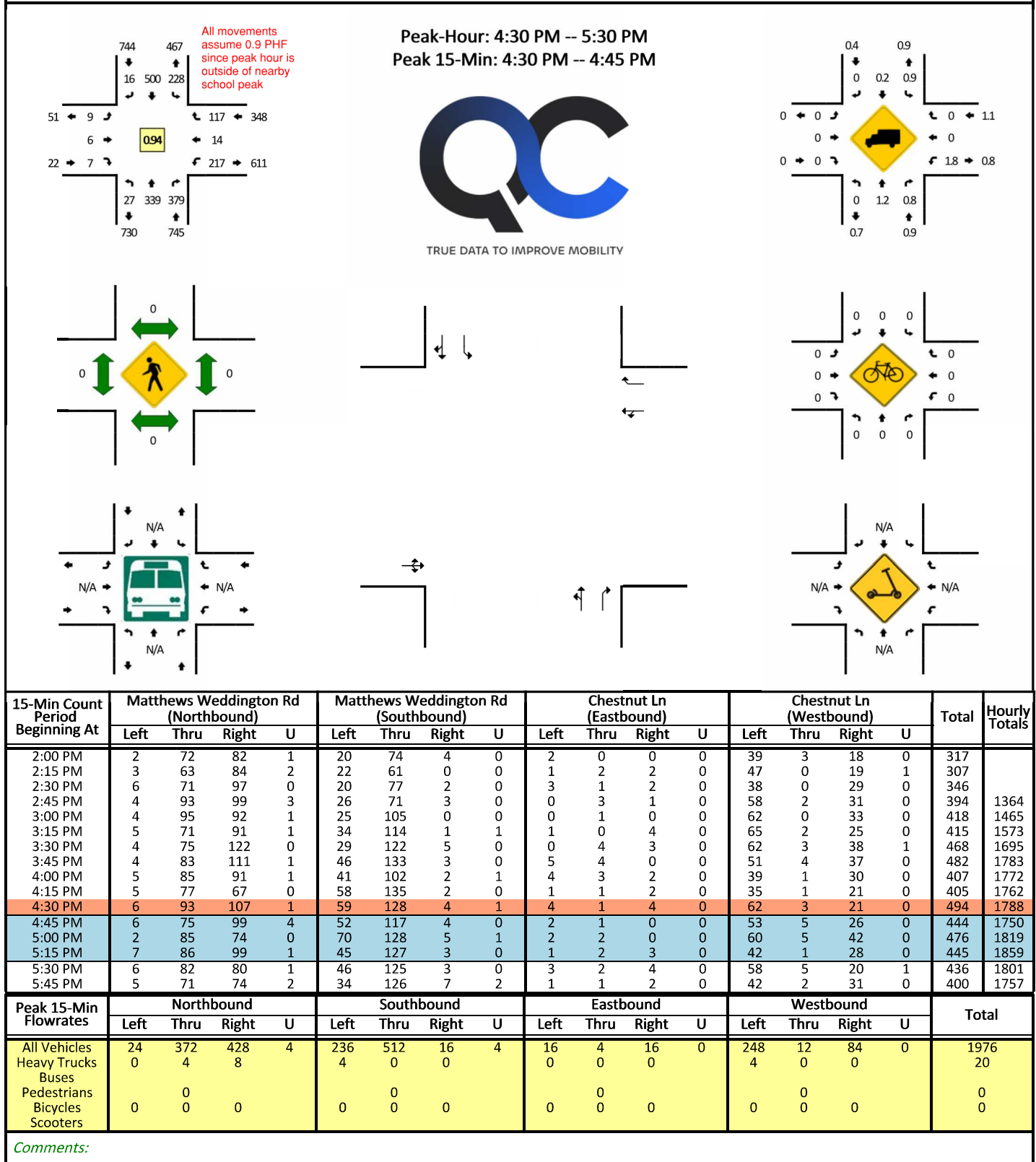
⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

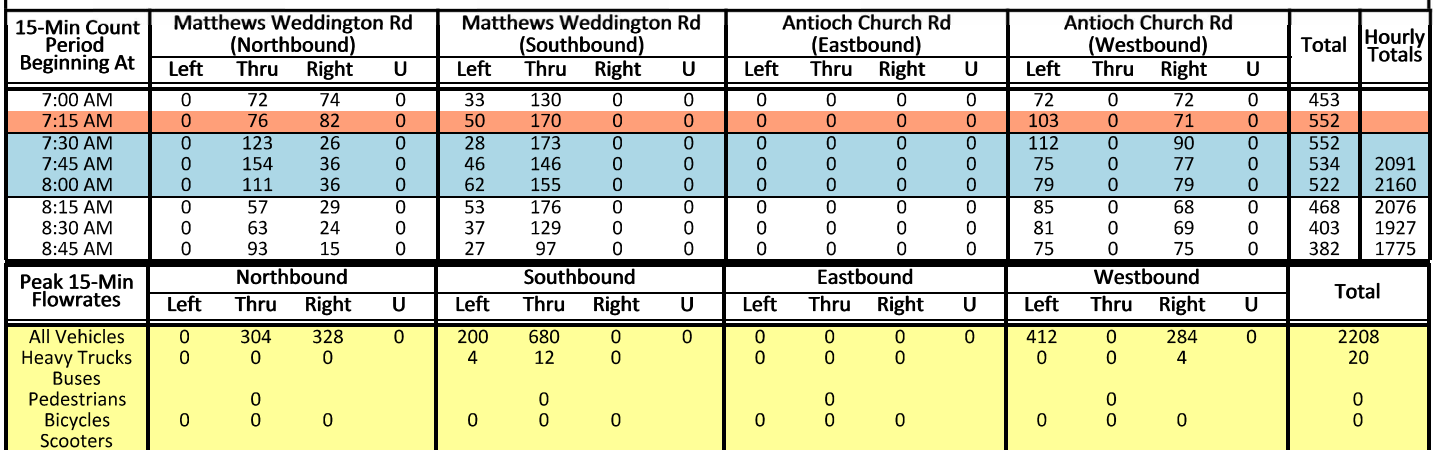
⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

LOCATION: Matthews Weddington Rd -- Chestnut Ln**CITY/STATE:** Stallings, NC**QC JOB #:** 16885401**DATE:** Tue, Feb 11 2025

LOCATION: Matthews Weddington Rd -- Chestnut Ln**CITY/STATE:** Stallings, NC**QC JOB #:** 16885402**DATE:** Tue, Feb 11 2025

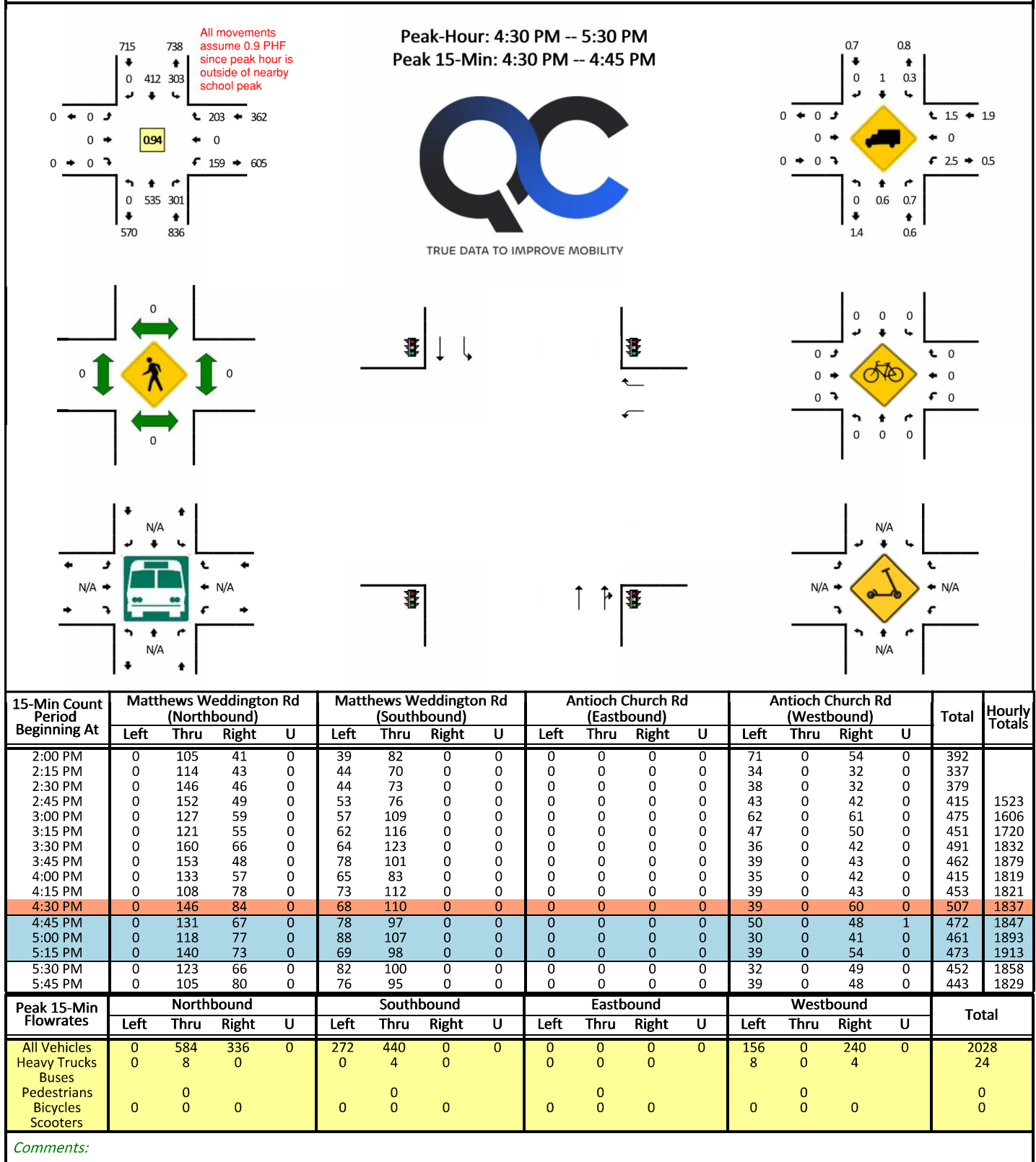
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DATE: Tue, Feb 11 2025



Report generated on 3/24/2025 4:41 PM SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

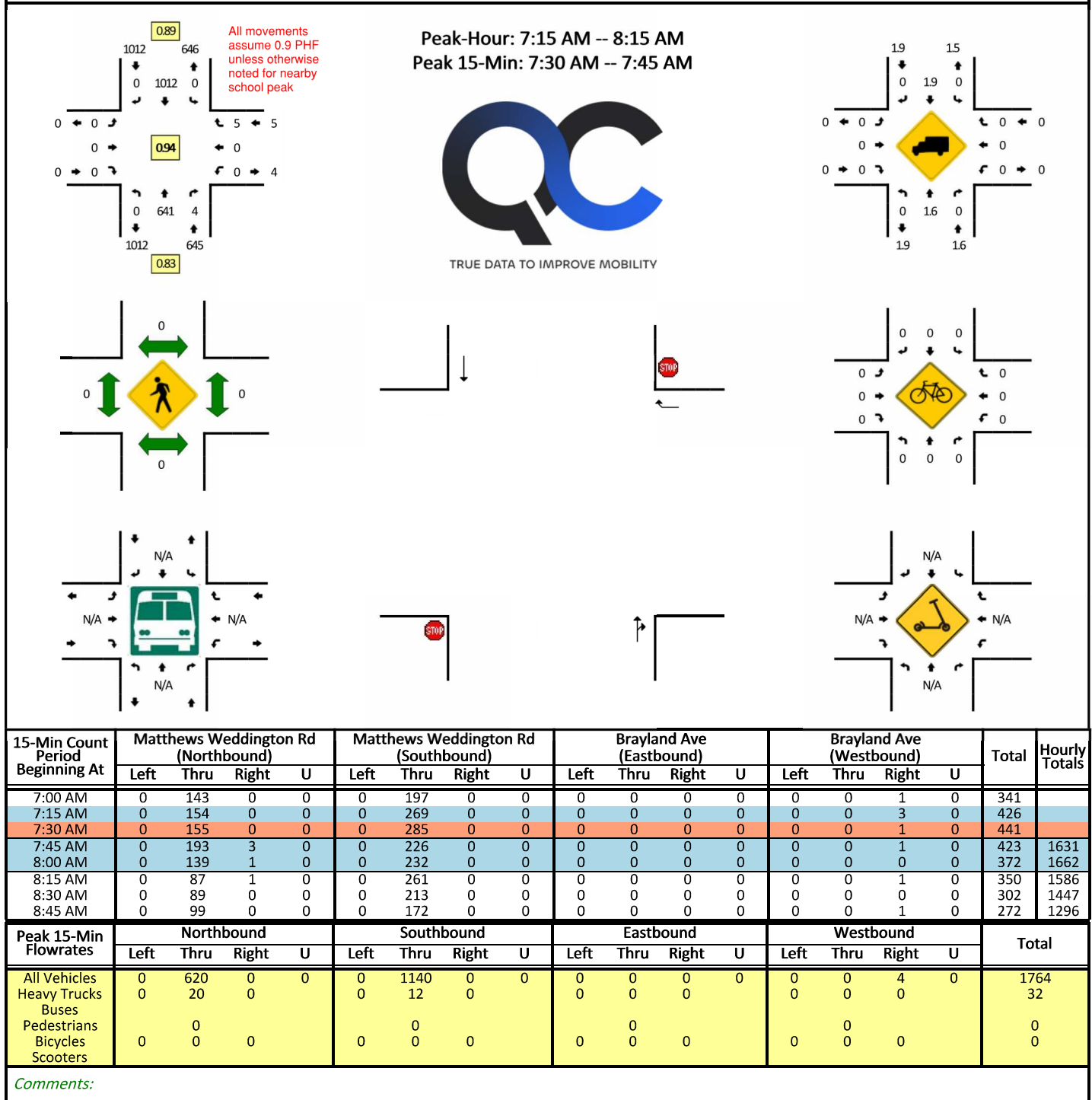
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CITY/STATE: Stallings, NC

QC JOB #: 16885404
DATE: Tue, Feb 11 2025



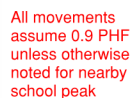
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CITY/STATE: Stallings, NC

QC JOB #: 16885405
DATE: Tue, Feb 11 2025



OC JOB #: 16885406

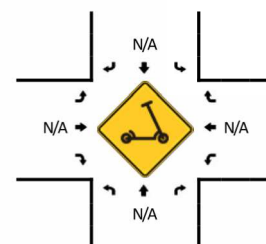
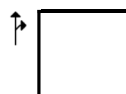
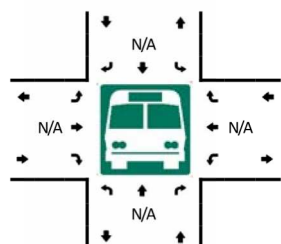
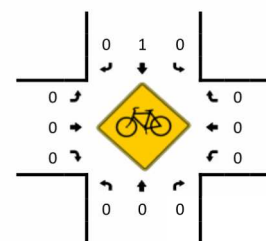
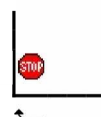
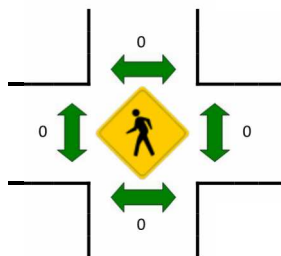
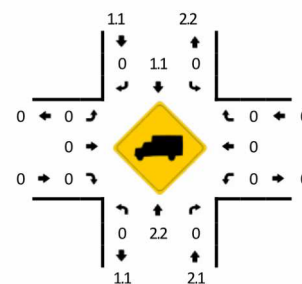
DATE: Tue, Feb 11 2025



Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:30 PM -- 3:45 PM



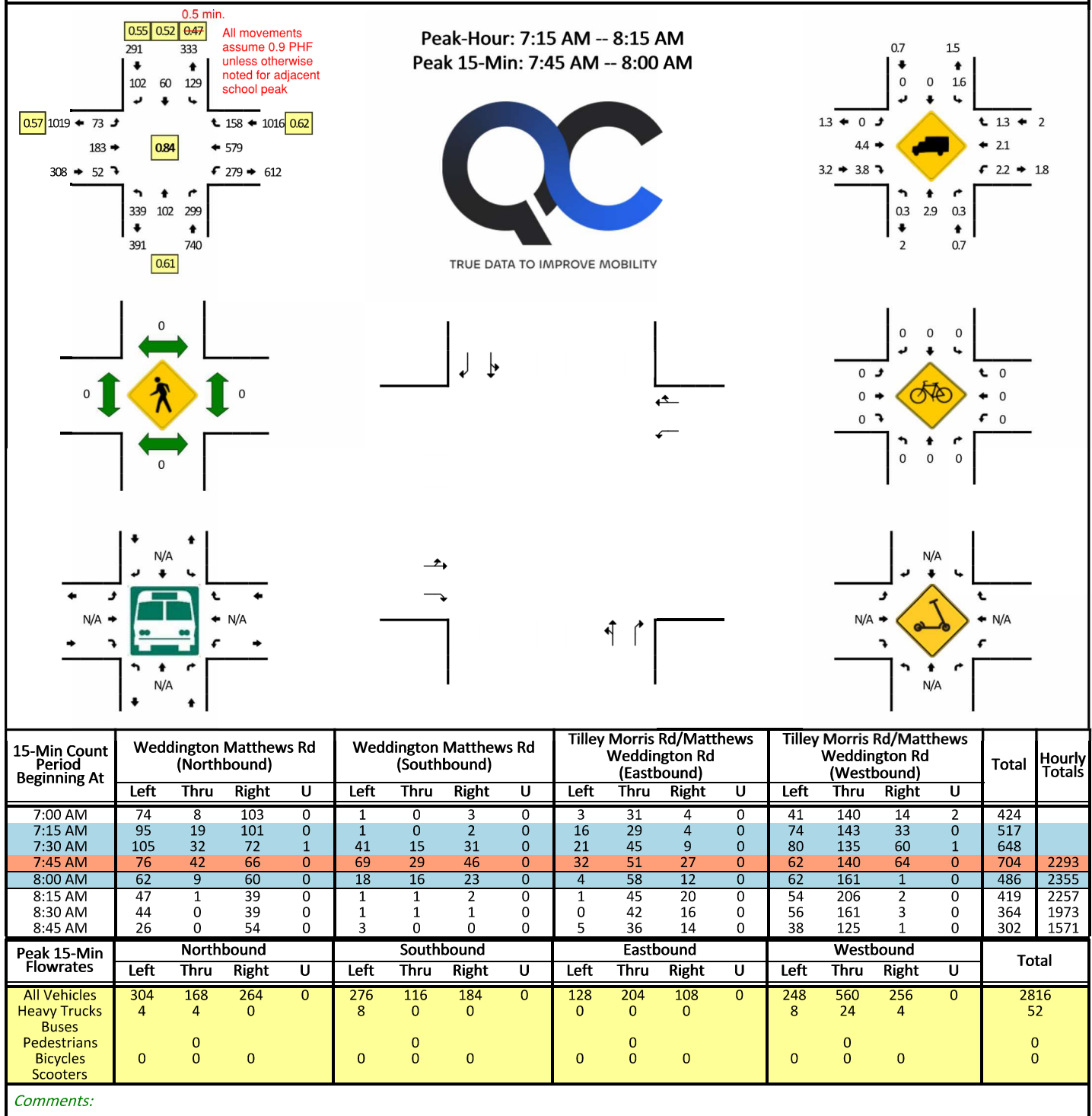
TRUE DATA TO IMPROVE MOBILITY



Comments:

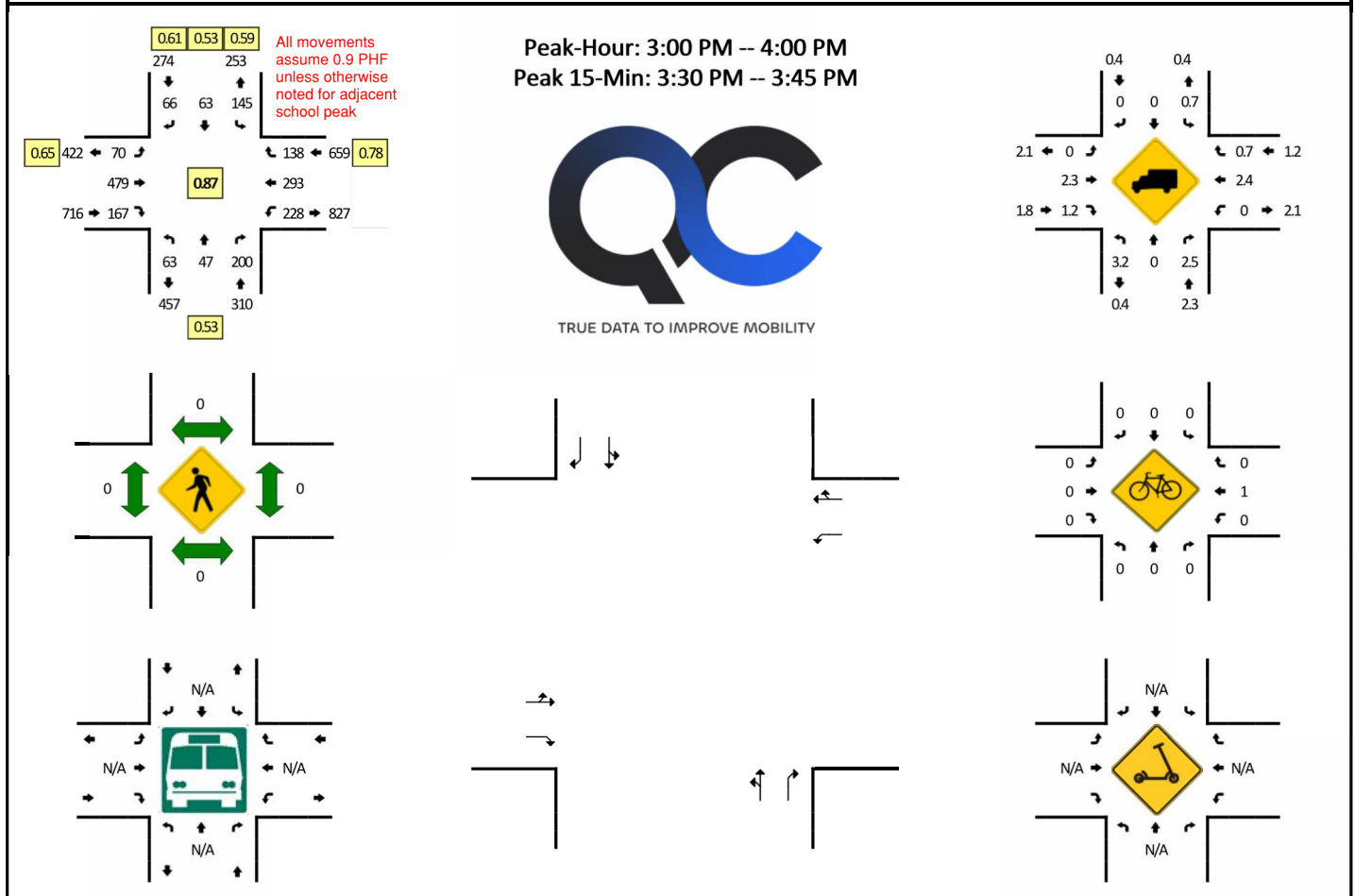
LOCATION: Weddington Matthews Rd -- Tilley Morris Rd/Matthews Weddington Rd
CITY/STATE: Weddington, NC

QC JOB #: 16885407
DATE: Tue, Feb 11 2025



LOCATION: Weddington Matthews Rd -- Tilley Morris Rd/Matthews Weddington Rd
CITY/STATE: Weddington, NC

QC JOB #: 16885408
DATE: Tue, Feb 11 2025



15-Min Count Period Beginning At	Weddington Matthews Rd (Northbound)				Weddington Matthews Rd (Southbound)				Tilley Morris Rd/Matthews Weddington Rd (Eastbound)				Tilley Morris Rd/Matthews Weddington Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	8	1	58	0	2	3	0	0	0	93	24	0	68	73	1	0	331	
2:15 PM	13	0	38	0	3	1	2	0	3	106	14	0	41	61	5	2	289	
2:30 PM	15	1	70	0	1	1	2	0	1	141	20	0	38	66	1	1	358	
2:45 PM	17	3	61	0	0	1	0	0	2	128	26	0	40	66	2	2	348	1326
3:00 PM	10	15	69	2	0	0	3	0	26	117	36	0	52	85	43	1	459	1454
3:15 PM	17	5	48	0	26	6	14	0	20	114	28	0	59	72	35	1	445	1610
3:30 PM	16	22	47	0	58	30	27	0	15	132	47	2	56	64	44	0	560	1812
3:45 PM	18	5	36	0	61	27	22	0	7	116	56	0	58	72	16	1	495	1959
4:00 PM	16	1	44	1	16	8	11	0	4	110	44	0	47	61	2	0	365	1865
4:15 PM	21	1	48	0	5	3	3	0	1	136	39	0	66	72	3	1	399	1819
4:30 PM	19	2	57	0	5	4	2	0	3	159	45	0	65	78	2	1	442	1701
4:45 PM	19	1	58	0	1	3	1	0	1	141	44	0	63	76	1	3	412	1618
5:00 PM	18	0	50	0	5	3	0	0	2	147	59	0	55	75	1	2	417	1670
5:15 PM	20	0	53	1	7	0	0	0	1	151	49	0	64	77	1	0	424	1695
5:30 PM	18	0	50	0	2	1	0	0	0	136	57	0	54	71	1	2	392	1645
5:45 PM	14	1	37	0	1	0	0	0	0	138	43	1	60	69	1	3	368	1601
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	64	88	188	0	232	120	108	0	60	528	188	8	224	256	176	0	2240	
Heavy Trucks	4	0	4		4	0	0		0	4	4		0	8	0		28	
Buses																		
Pedestrians	0	0			0	0			0	0			0	0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

SIGNAL FACE	PHASE			
	Ø 1 + 6	Ø 2 + 6	Ø 4	FLASH
11	→	←	→	→
21, 22	R	G	R	Y
41, 42	R	R	G	R
61, 62	G	G	R	Y

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NOTES
1A	6X40	0	EXISTING	-	1	Y	Y	-	-	15	-	
					6	Y	Y	Y	-	3	-	
2A	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	
4A	6X40	0	EXISTING	-	4	Y	Y	-	-	-	-	
4B	6X40	0	EXISTING	-	4	Y	Y	-	-	15	-	
6A	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	

3 Phase
Fully Actuated
Isolated

NOTES

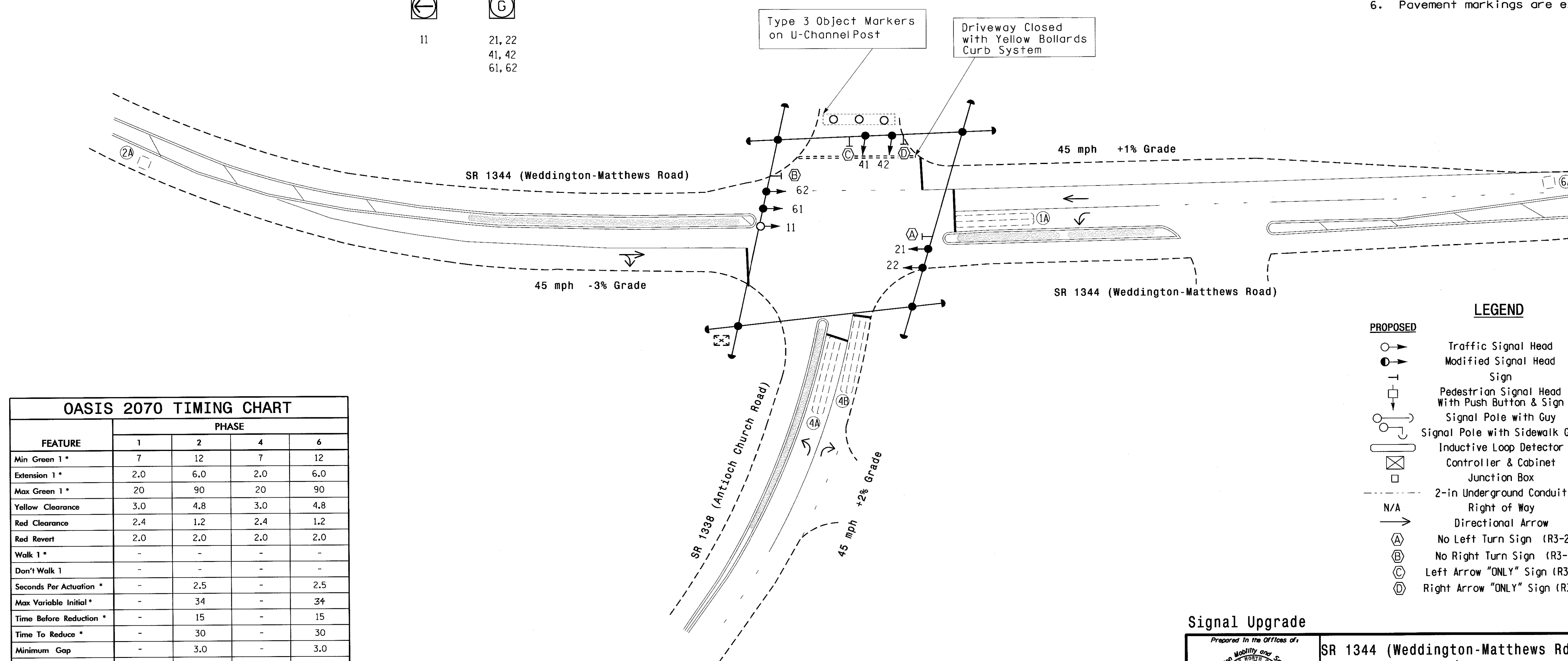
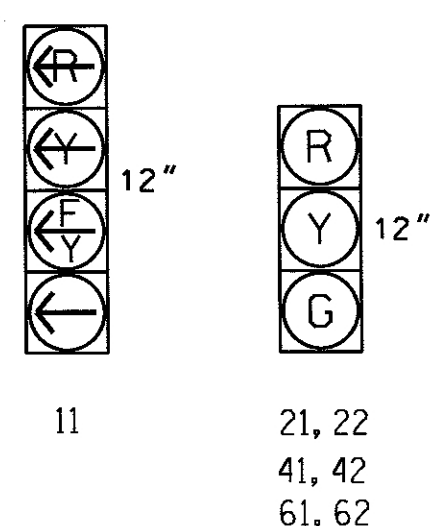
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition existing signal heads numbered 61 & 62.
5. Set all detector units to presence mode.
6. Pavement markings are existing.

PHASING DIAGRAM DETECTION LEGEND

- | | |
|------|-------------------------------|
| ←● | DETECTED MOVEMENT |
| ←— | UNDETECTED MOVEMENT (OVERLAP) |
| ←--- | UNSIGNALIZED MOVEMENT |
| ↔--- | PEDESTRIAN MOVEMENT |

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART				
FEATURE	PHASE			
	1	2	4	6
Min Green 1 *	7	12	7	12
Extension 1 *	2.0	6.0	2.0	6.0
Max Green 1 *	20	90	20	90
Yellow Clearance	3.0	4.8	3.0	4.8
Red Clearance	2.4	1.2	2.4	1.2
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	2.5	-	2.5
Max Variable Initial *	-	34	-	34
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

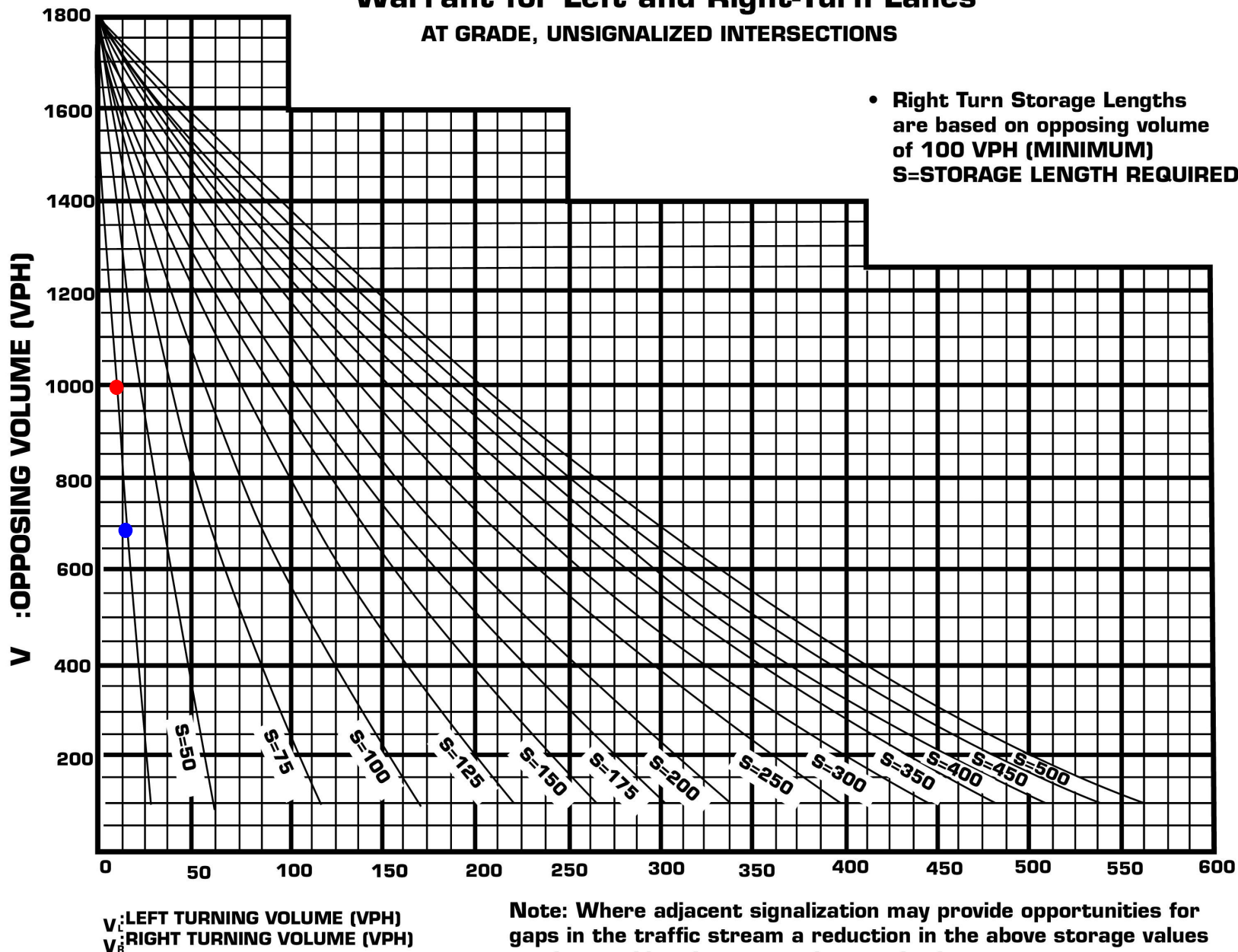
<u>PROPOSED</u>	<u>EXISTING</u>
	N/A
-----	-----
N/A	
(A)	(A)
(B)	(B)
(C)	(C)
(D)	(D)

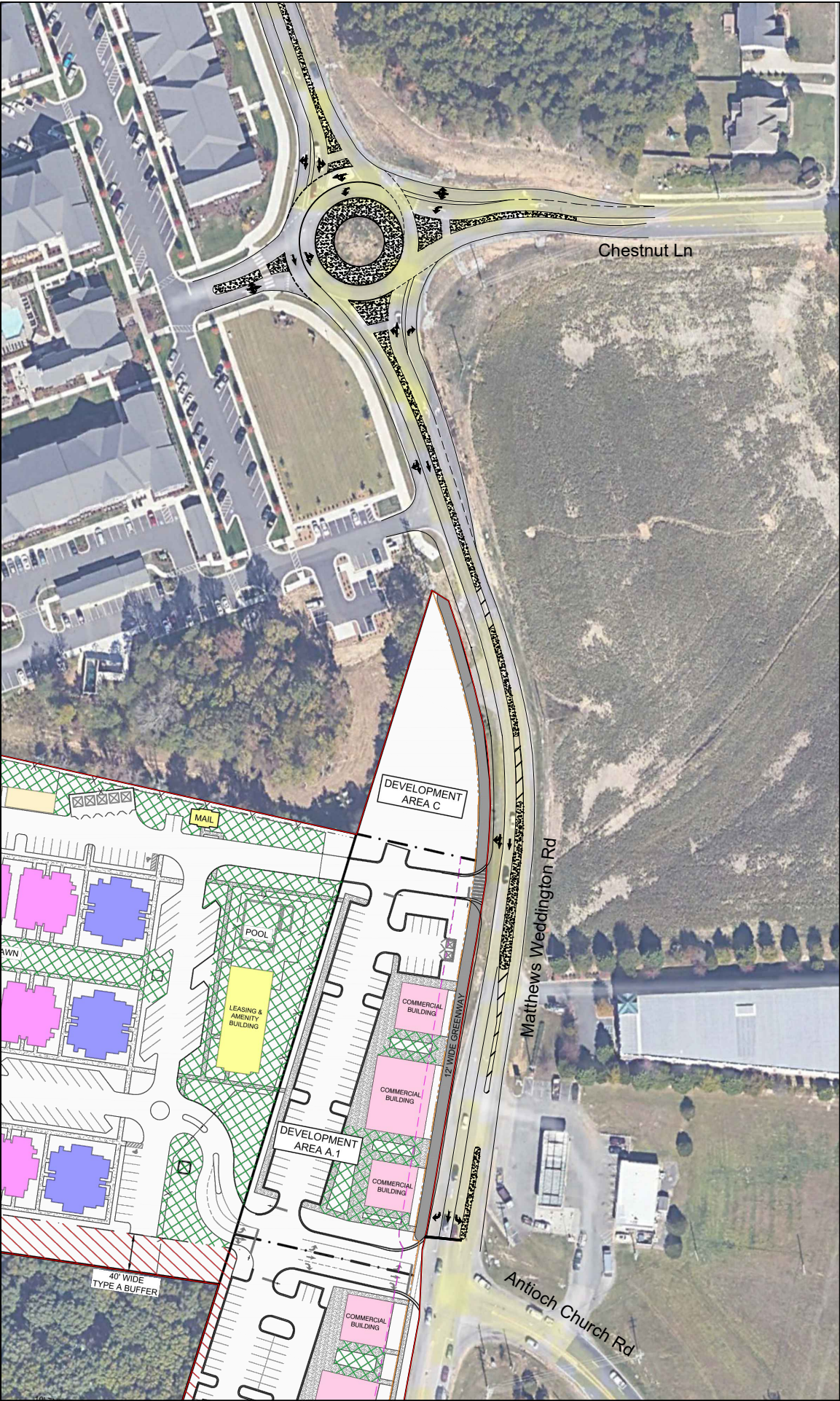
Signal Upgrade

Prepared In The Offices of:  TRANSPORTATION MOBILITY AND SAFETY DIVISION STATE OF NORTH CAROLINA SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529	SR 1344 (Weddington-Matthews Rd.) at SR 1338 (Antioch Church Rd.) Division 10 Union County Stallings PLAN DATE: November 2013 REVIEWED BY: PREPARED BY: C. Pierce REVIEWED BY: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISIONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE																															SEAL  SEAL 30530 ZACHARY M. LITTLE ENGINEER NORTH CAROLINA PROFESSIONAL SIG. INVENTORY NO. 10-1978
REVISIONS	INIT.	DATE																																	

AM Peak
PM Peak

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS





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TRANSPORTATION PLANNING

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704.343.0608
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THE COTTAGE GREEN

STALLINGS, NORTH CAROLINA

HMF AMERICANA, LLC
PO BOX 7862
THE WOODLANDS, TX 77387

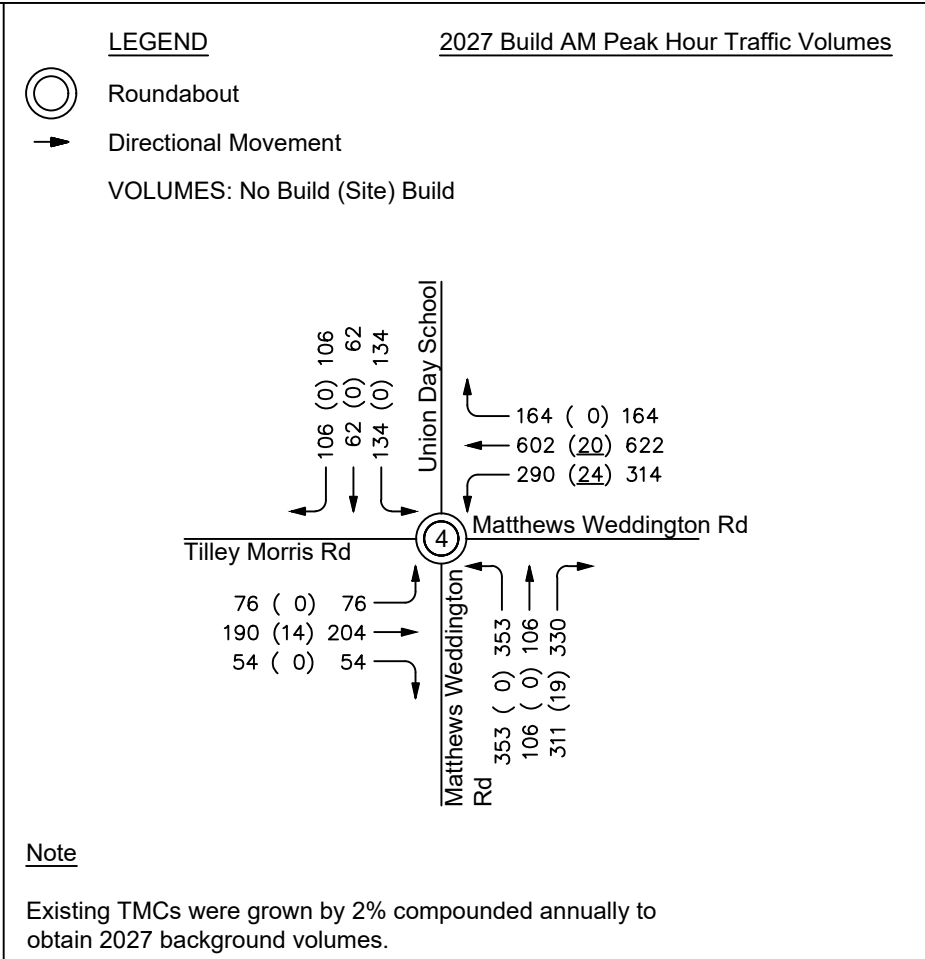
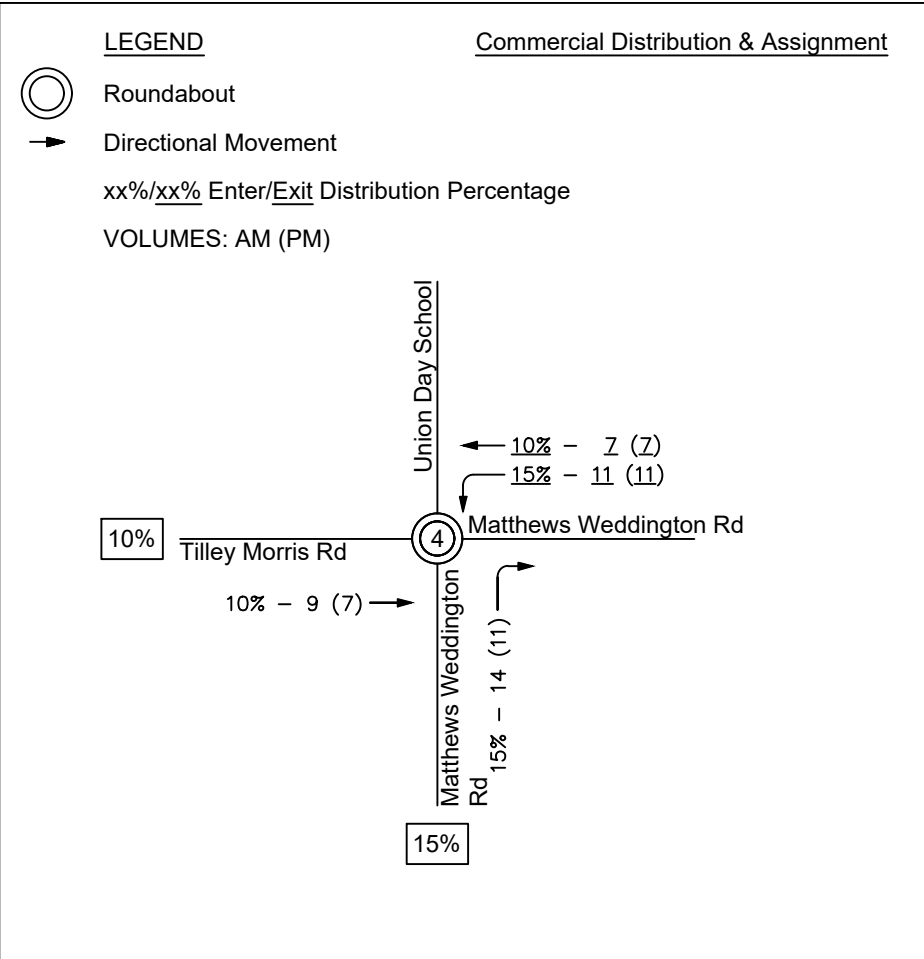
INTERSECTION 1 IMPROVEMENTS CONCEPT

0' 75' 150' N
SCALE: 1" = 150'

PROJECT #: 1134-001
DRAWN BY: CRB
CHECKED BY: REG

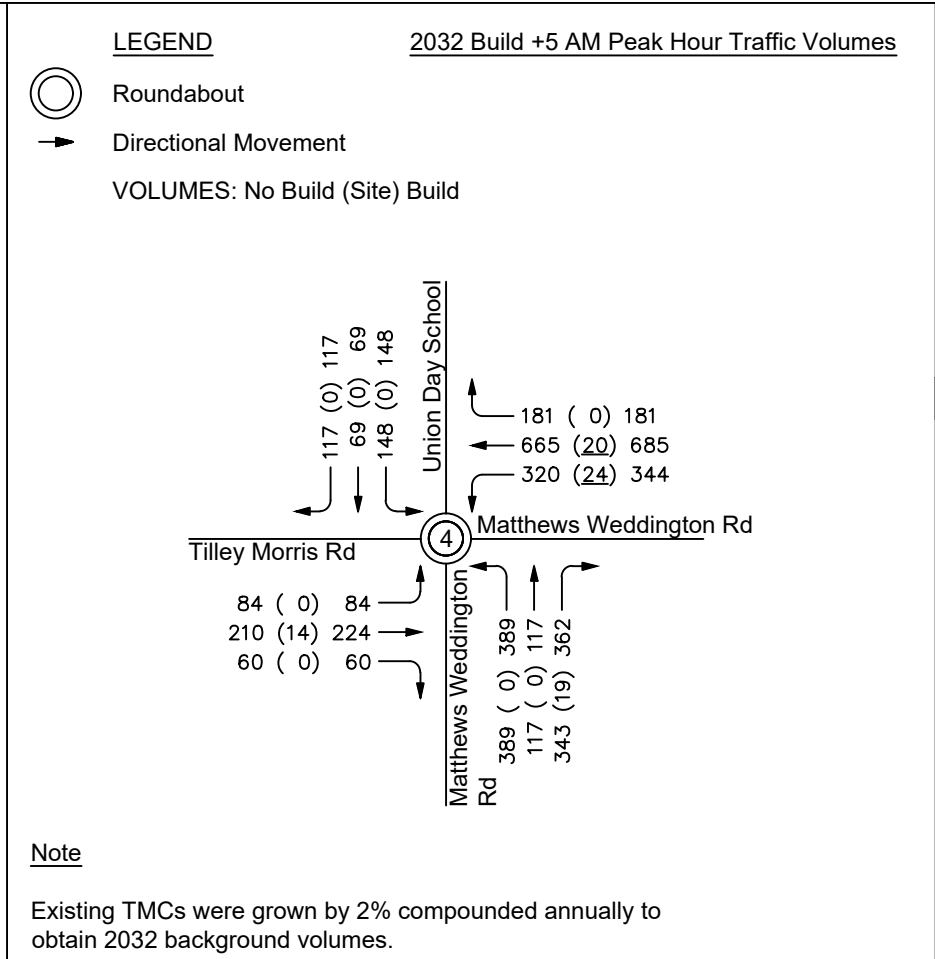
AUGUST 2025

REVISIONS:



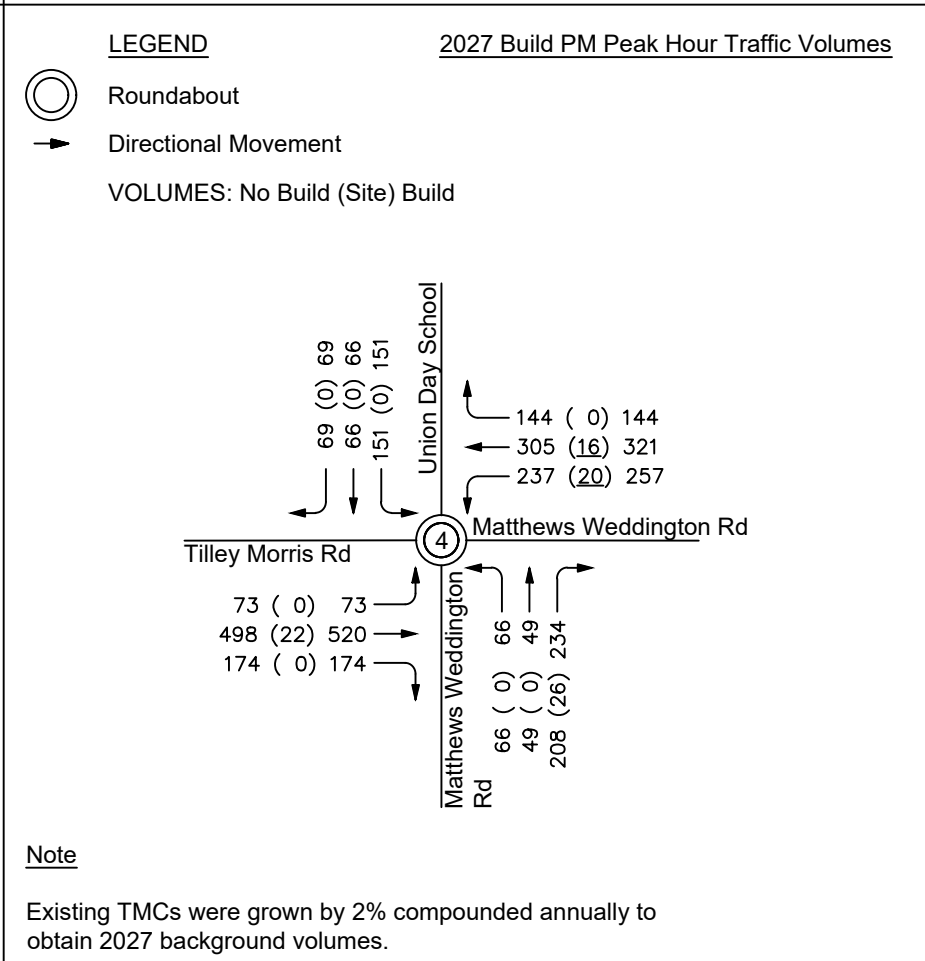
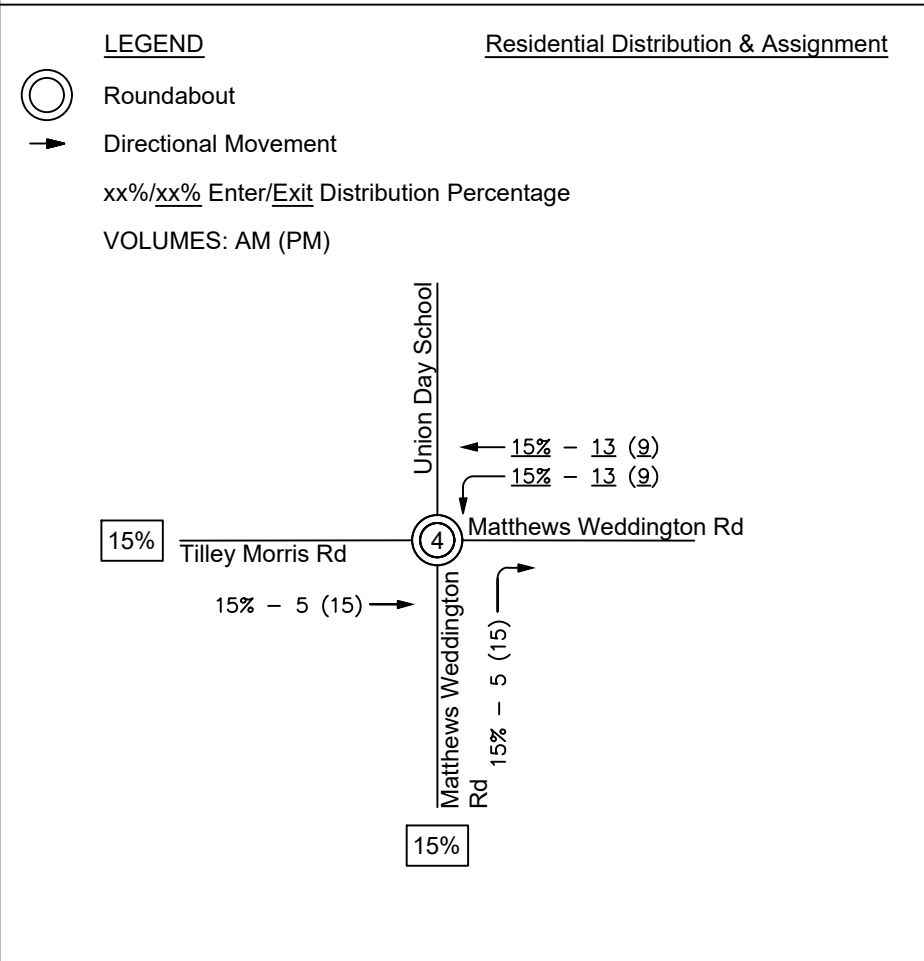
Note

Existing TMCs were grown by 2% compounded annually to obtain 2027 background volumes.



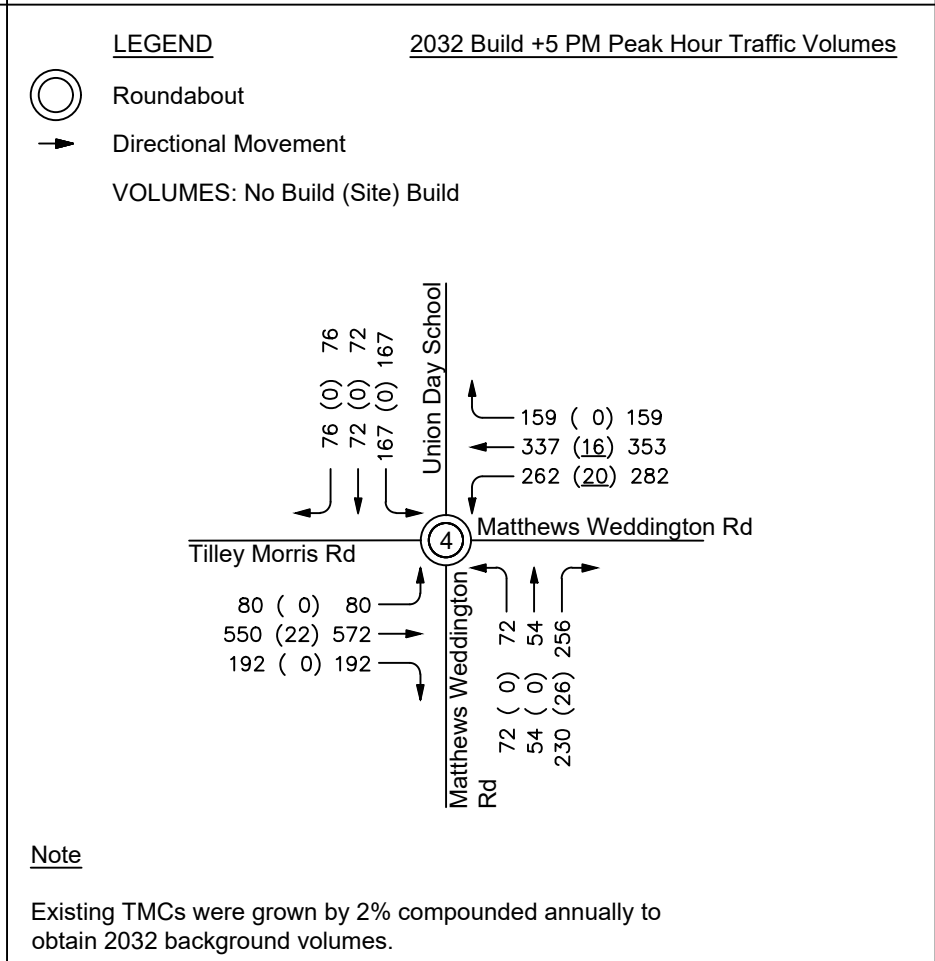
Note

Existing TMCs were grown by 2% compounded annually to obtain 2032 background volumes.



Note

Existing TMCs were grown by 2% compounded annually to obtain 2027 background volumes.



Note

Existing TMCs were grown by 2% compounded annually to obtain 2032 background volumes.

**INTERSECTION 4
BUILD W/ IMP. AT
INTERSECTIONS
1 & 2**

SCALE: NTS

PROJECT #: 1134-001
DRAWN BY: CRB
CHECKED BY: REG

AUGUST 2025

REVISIONS:

MOVEMENT SUMMARY

 Site: 1 [2025 Existing AM (Site Folder: General)]

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	9	2.0	12	2.0	0.535	9.1	LOS A	3.4	86.0	0.47	0.32	0.47	33.3
8	T1	521	2.0	628	2.0	0.535	9.1	LOS A	3.4	86.0	0.47	0.32	0.47	33.2
18	R2	251	2.0	302	2.0	0.269	5.7	LOS A	1.2	31.5	0.35	0.23	0.35	33.7
Approach		781	2.0	942	2.0	0.535	8.0	LOS A	3.4	86.0	0.43	0.29	0.43	33.3
East: Chestnut Ln														
1	L2	492	3.0	615	3.0	0.833	28.2	LOS D	12.2	313.2	0.93	1.43	2.40	24.7
6	T1	6	2.0	7	2.0	0.833	28.2	LOS D	12.2	313.2	0.93	1.43	2.40	24.6
16	R2	269	2.0	299	2.0	0.397	9.9	LOS A	2.0	51.2	0.66	0.72	0.82	31.7
Approach		767	2.6	921	2.7	0.833	22.3	LOS C	12.2	313.2	0.85	1.20	1.89	26.5
North: Matthews Weddington Rd														
7	L2	114	2.0	127	2.0	0.165	6.4	LOS A	0.6	16.1	0.57	0.55	0.57	32.0
4	T1	322	2.0	429	2.0	0.564	13.4	LOS B	4.2	106.1	0.75	0.90	1.20	31.2
14	R2	4	2.0	4	2.0	0.564	13.4	LOS B	4.2	106.1	0.75	0.90	1.20	30.4
Approach		440	2.0	560	2.0	0.564	11.8	LOS B	4.2	106.1	0.71	0.82	1.06	31.4
West: Chestnut Ln														
5	L2	20	2.0	22	2.0	0.132	8.9	LOS A	0.4	11.1	0.67	0.67	0.67	32.5
2	T1	23	2.0	26	2.0	0.132	8.9	LOS A	0.4	11.1	0.67	0.67	0.67	32.4
12	R2	14	2.0	19	2.0	0.132	8.9	LOS A	0.4	11.1	0.67	0.67	0.67	31.5
Approach		57	2.0	66	2.0	0.132	8.9	LOS A	0.4	11.1	0.67	0.67	0.67	32.2
All Vehicles		2045	2.2	2490	2.2	0.833	14.2	LOS B	12.2	313.2	0.65	0.76	1.12	30.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

 Site: 1 [2025 Existing PM (Site Folder: General)]

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	27	2.0	30	2.0	0.396	7.8	LOS A	2.0	50.9	0.49	0.39	0.49	33.8
8	T1	339	2.0	377	2.0	0.396	7.8	LOS A	2.0	50.9	0.49	0.39	0.49	33.7
18	R2	379	2.0	421	2.0	0.382	7.2	LOS A	1.9	47.6	0.46	0.36	0.46	32.9
Approach		745	2.0	828	2.0	0.396	7.5	LOS A	2.0	50.9	0.48	0.38	0.48	33.3
East: Chestnut Ln														
1	L2	217	2.0	241	2.0	0.271	6.6	LOS A	1.2	30.3	0.52	0.46	0.52	32.1
6	T1	14	2.0	16	2.0	0.271	6.6	LOS A	1.2	30.3	0.52	0.46	0.52	32.0
16	R2	117	2.0	130	2.0	0.137	5.1	LOS A	0.5	13.8	0.47	0.39	0.47	34.0
Approach		348	2.0	387	2.0	0.271	6.1	LOS A	1.2	30.3	0.51	0.44	0.51	32.7
North: Matthews Weddington Rd														
7	L2	228	2.0	253	2.0	0.237	5.6	LOS A	1.1	26.9	0.43	0.33	0.43	32.4
4	T1	500	2.0	556	2.0	0.537	9.9	LOS A	4.0	101.5	0.60	0.54	0.69	32.8
14	R2	16	2.0	18	2.0	0.537	9.9	LOS A	4.0	101.5	0.60	0.54	0.69	31.8
Approach		744	2.0	827	2.0	0.537	8.6	LOS A	4.0	101.5	0.55	0.47	0.61	32.7
West: Chestnut Ln														
5	L2	9	2.0	10	2.0	0.044	6.9	LOS A	0.1	3.6	0.61	0.60	0.61	33.3
2	T1	6	2.0	7	2.0	0.044	6.9	LOS A	0.1	3.6	0.61	0.60	0.61	33.1
12	R2	7	2.0	8	2.0	0.044	6.9	LOS A	0.1	3.6	0.61	0.60	0.61	32.2
Approach		22	2.0	24	2.0	0.044	6.9	LOS A	0.1	3.6	0.61	0.60	0.61	32.9
All Vehicles		1859	2.0	2066	2.0	0.537	7.7	LOS A	4.0	101.5	0.51	0.43	0.54	32.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

 Site: 1 [2027 No Build AM (Site Folder: General)]

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	9	2.0	12	2.0	0.559	9.6	LOS A	3.7	93.0	0.50	0.35	0.50	33.0
8	T1	542	2.0	653	2.0	0.559	9.6	LOS A	3.7	93.0	0.50	0.35	0.50	32.9
18	R2	261	2.0	314	2.0	0.282	5.9	LOS A	1.3	33.3	0.36	0.24	0.36	33.6
Approach		812	2.0	979	2.0	0.559	8.4	LOS A	3.7	93.0	0.45	0.31	0.45	33.1
East: Chestnut Ln														
1	L2	512	3.0	640	3.0	0.889	35.4	LOS E	15.5	395.8	0.98	1.63	2.92	23.0
6	T1	6	2.0	7	2.0	0.889	35.3	LOS E	15.5	395.8	0.98	1.63	2.92	22.9
16	R2	280	2.0	311	2.0	0.423	10.6	LOS B	2.3	57.5	0.68	0.75	0.89	31.4
Approach		798	2.6	958	2.7	0.889	27.3	LOS D	15.5	395.8	0.88	1.35	2.26	25.1
North: Matthews Weddington Rd														
7	L2	119	2.0	132	2.0	0.176	6.7	LOS A	0.7	17.2	0.58	0.57	0.58	31.9
4	T1	335	2.0	447	2.0	0.601	14.7	LOS B	4.7	120.1	0.77	0.95	1.31	30.7
14	R2	4	2.0	4	2.0	0.601	14.7	LOS B	4.7	120.1	0.77	0.95	1.31	29.8
Approach		458	2.0	583	2.0	0.601	12.9	LOS B	4.7	120.1	0.73	0.87	1.15	31.0
West: Chestnut Ln														
5	L2	21	2.0	23	2.0	0.145	9.5	LOS A	0.5	12.2	0.69	0.69	0.69	32.3
2	T1	24	2.0	27	2.0	0.145	9.5	LOS A	0.5	12.2	0.69	0.69	0.69	32.2
12	R2	15	2.0	20	2.0	0.145	9.5	LOS A	0.5	12.2	0.69	0.69	0.69	31.3
Approach		60	2.0	70	2.0	0.145	9.5	LOS A	0.5	12.2	0.69	0.69	0.69	31.9
All Vehicles		2128	2.2	2591	2.2	0.889	16.4	LOS C	15.5	395.8	0.68	0.83	1.28	29.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

 Site: 1 [2027 No Build PM (Site Folder: General)]

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	28	2.0	31	2.0	0.416	8.1	LOS A	2.1	54.4	0.51	0.41	0.51	33.6
8	T1	353	2.0	392	2.0	0.416	8.1	LOS A	2.1	54.4	0.51	0.41	0.51	33.5
18	R2	394	2.0	438	2.0	0.401	7.5	LOS A	2.0	50.8	0.48	0.38	0.48	32.8
Approach		775	2.0	861	2.0	0.416	7.8	LOS A	2.1	54.4	0.49	0.40	0.49	33.1
East: Chestnut Ln														
1	L2	226	2.0	251	2.0	0.288	6.9	LOS A	1.3	32.4	0.54	0.48	0.54	32.0
6	T1	15	2.0	17	2.0	0.288	6.9	LOS A	1.3	32.4	0.54	0.48	0.54	31.9
16	R2	122	2.0	136	2.0	0.146	5.3	LOS A	0.6	14.7	0.48	0.41	0.48	33.9
Approach		363	2.0	403	2.0	0.288	6.3	LOS A	1.3	32.4	0.52	0.46	0.52	32.6
North: Matthews Weddington Rd														
7	L2	237	2.0	263	2.0	0.250	5.8	LOS A	1.1	28.4	0.45	0.35	0.45	32.3
4	T1	520	2.0	578	2.0	0.566	10.6	LOS B	4.9	124.5	0.63	0.61	0.80	32.5
14	R2	17	2.0	19	2.0	0.566	10.6	LOS B	4.9	124.5	0.63	0.61	0.80	31.5
Approach		774	2.0	860	2.0	0.566	9.1	LOS A	4.9	124.5	0.57	0.53	0.70	32.4
West: Chestnut Ln														
5	L2	9	2.0	10	2.0	0.045	7.2	LOS A	0.1	3.7	0.62	0.62	0.62	33.1
2	T1	6	2.0	7	2.0	0.045	7.2	LOS A	0.1	3.7	0.62	0.62	0.62	33.0
12	R2	7	2.0	8	2.0	0.045	7.2	LOS A	0.1	3.7	0.62	0.62	0.62	32.1
Approach		22	2.0	24	2.0	0.045	7.2	LOS A	0.1	3.7	0.62	0.62	0.62	32.8
All Vehicles		1934	2.0	2149	2.0	0.566	8.0	LOS A	4.9	124.5	0.53	0.46	0.58	32.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

Site: 1 [2027 Build AM (Site Folder: General)]

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] veh/h %		DEMAND FLOWS [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	9	2.0	12	2.0	0.602	10.5	LOS B	4.2	107.2	0.53	0.38	0.53	32.6
8	T1	584	2.0	704	2.0	0.602	10.5	LOS B	4.2	107.2	0.53	0.38	0.53	32.5
18	R2	294	2.0	354	2.0	0.318	6.3	LOS A	1.5	39.0	0.38	0.25	0.38	33.4
Approach		887	2.0	1070	2.0	0.602	9.1	LOS A	4.2	107.2	0.48	0.34	0.48	32.8
East: Chestnut Ln														
1	L2	540	3.0	675	3.0	0.982	54.0	LOS F	23.7	607.4	1.00	2.05	4.19	19.4
6	T1	6	2.0	7	2.0	0.982	53.9	LOS F	23.7	607.4	1.00	2.05	4.19	19.4
16	R2	280	2.0	311	2.0	0.444	11.4	LOS B	2.4	61.6	0.70	0.79	0.97	31.0
Approach		826	2.7	993	2.7	0.982	40.6	LOS E	23.7	607.4	0.91	1.65	3.18	21.9
North: Matthews Weddington Rd														
7	L2	119	2.0	132	2.0	0.182	7.0	LOS A	0.7	17.7	0.59	0.59	0.59	31.8
4	T1	370	2.0	493	2.0	0.685	18.4	LOS C	6.3	161.2	0.83	1.09	1.60	29.2
14	R2	4	2.0	4	2.0	0.685	18.4	LOS C	6.3	161.2	0.83	1.09	1.60	28.5
Approach		493	2.0	630	2.0	0.685	16.0	LOS C	6.3	161.2	0.78	0.98	1.39	29.7
West: Chestnut Ln														
5	L2	21	2.0	23	2.0	0.156	10.3	LOS B	0.5	12.9	0.71	0.71	0.71	31.9
2	T1	24	2.0	27	2.0	0.156	10.3	LOS B	0.5	12.9	0.71	0.71	0.71	31.8
12	R2	15	2.0	20	2.0	0.156	10.3	LOS B	0.5	12.9	0.71	0.71	0.71	30.9
Approach		60	2.0	70	2.0	0.156	10.3	LOS B	0.5	12.9	0.71	0.71	0.71	31.6
All Vehicles		2266	2.2	2763	2.2	0.982	22.1	LOS C	23.7	607.4	0.71	0.97	1.66	27.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

 **Site: 1 [2027 Build PM (Site Folder: General)]**

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	28	2.0	31	2.0	0.462	8.8	LOS A	2.5	63.5	0.54	0.44	0.54	33.3
8	T1	395	2.0	439	2.0	0.462	8.8	LOS A	2.5	63.5	0.54	0.44	0.54	33.1
18	R2	427	2.0	474	2.0	0.434	8.0	LOS A	2.2	57.1	0.50	0.40	0.50	32.5
Approach		850	2.0	944	2.0	0.462	8.4	LOS A	2.5	63.5	0.52	0.42	0.52	32.9
East: Chestnut Ln														
1	L2	268	2.0	298	2.0	0.353	8.0	LOS A	1.6	41.1	0.59	0.56	0.59	31.5
6	T1	15	2.0	17	2.0	0.353	8.0	LOS A	1.6	41.1	0.59	0.56	0.59	31.4
16	R2	122	2.0	136	2.0	0.152	5.5	LOS A	0.6	15.3	0.51	0.44	0.51	33.8
Approach		405	2.0	450	2.0	0.353	7.2	LOS A	1.6	41.1	0.56	0.52	0.56	32.1
North: Matthews Weddington Rd														
7	L2	237	2.0	263	2.0	0.261	6.1	LOS A	1.2	29.5	0.48	0.40	0.48	32.2
4	T1	572	2.0	636	2.0	0.648	13.1	LOS B	7.7	196.5	0.73	0.84	1.17	31.4
14	R2	17	2.0	19	2.0	0.648	13.1	LOS B	7.7	196.5	0.73	0.84	1.17	30.5
Approach		826	2.0	918	2.0	0.648	11.1	LOS B	7.7	196.5	0.66	0.72	0.97	31.6
West: Chestnut Ln														
5	L2	9	2.0	10	2.0	0.050	7.9	LOS A	0.2	4.0	0.66	0.66	0.66	32.8
2	T1	6	2.0	7	2.0	0.050	7.9	LOS A	0.2	4.0	0.66	0.66	0.66	32.7
12	R2	7	2.0	8	2.0	0.050	7.9	LOS A	0.2	4.0	0.66	0.66	0.66	31.8
Approach		22	2.0	24	2.0	0.050	7.9	LOS A	0.2	4.0	0.66	0.66	0.66	32.4
All Vehicles		2103	2.0	2337	2.0	0.648	9.2	LOS A	7.7	196.5	0.58	0.56	0.71	32.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

 Site: 1 [2027 Build w Imp AM (Site Folder: General)]

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	9	2.0	12	2.0	0.609	10.7	LOS B	4.5	115.4	0.57	0.40	0.57	32.5
8	T1	584	2.0	704	2.0	0.609	10.7	LOS B	4.5	115.4	0.57	0.40	0.57	32.4
18	R2	294	2.0	354	2.0	0.301	5.9	LOS A	1.5	37.8	0.37	0.25	0.37	33.6
Approach		887	2.0	1070	2.0	0.609	9.1	LOS A	4.5	115.4	0.50	0.35	0.50	32.8
East: Chestnut Ln														
1	L2	540	3.0	675	3.0	0.713	20.5	LOS C	6.8	172.8	0.84	1.13	1.73	27.1
6	T1	6	2.0	7	2.0	0.713	20.4	LOS C	6.8	172.8	0.84	1.13	1.73	27.7
16	R2	280	2.0	311	2.0	0.713	20.4	LOS C	6.8	172.8	0.84	1.13	1.73	27.0
Approach		826	2.7	993	2.7	0.713	20.5	LOS C	6.8	172.8	0.84	1.13	1.73	27.1
North: Matthews Weddington Rd														
7	L2	119	2.0	132	2.0	0.436	11.4	LOS B	2.3	58.9	0.68	0.77	0.93	31.2
4	T1	370	2.0	493	2.0	0.436	10.8	LOS B	2.3	59.0	0.67	0.75	0.91	32.0
14	R2	4	2.0	4	2.0	0.436	10.5	LOS B	2.3	59.0	0.67	0.75	0.90	31.6
Approach		493	2.0	630	2.0	0.436	11.0	LOS B	2.3	59.0	0.67	0.76	0.92	31.8
West: Chestnut Ln														
5	L2	21	2.0	23	2.0	0.156	10.3	LOS B	0.5	12.9	0.71	0.71	0.71	31.9
2	T1	24	2.0	27	2.0	0.156	10.3	LOS B	0.5	12.9	0.71	0.71	0.71	31.8
12	R2	15	2.0	20	2.0	0.156	10.3	LOS B	0.5	12.9	0.71	0.71	0.71	30.9
Approach		60	2.0	70	2.0	0.156	10.3	LOS B	0.5	12.9	0.71	0.71	0.71	31.6
All Vehicles		2266	2.2	2763	2.2	0.713	13.7	LOS B	6.8	172.8	0.67	0.73	1.04	30.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

 **Site: 1 [2027 Build w Imp PM (Site Folder: General)]**

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	28	2.0	31	2.0	0.438	8.1	LOS A	2.4	60.9	0.53	0.42	0.53	33.6
8	T1	395	2.0	439	2.0	0.438	8.1	LOS A	2.4	60.9	0.53	0.42	0.53	33.5
18	R2	427	2.0	474	2.0	0.442	8.2	LOS A	2.4	61.7	0.53	0.42	0.53	32.4
Approach		850	2.0	944	2.0	0.442	8.2	LOS A	2.4	61.7	0.53	0.42	0.53	33.0
East: Chestnut Ln														
1	L2	268	2.0	298	2.0	0.252	6.7	LOS A	1.1	27.2	0.54	0.50	0.54	32.3
6	T1	15	2.0	17	2.0	0.252	6.7	LOS A	1.1	27.2	0.54	0.50	0.54	33.4
16	R2	122	2.0	136	2.0	0.252	6.7	LOS A	1.1	27.2	0.54	0.50	0.54	32.4
Approach		405	2.0	450	2.0	0.252	6.7	LOS A	1.1	27.2	0.54	0.50	0.54	32.4
North: Matthews Weddington Rd														
7	L2	237	2.0	263	2.0	0.461	9.3	LOS A	2.7	67.6	0.58	0.54	0.63	31.8
4	T1	572	2.0	636	2.0	0.461	8.9	LOS A	2.7	67.6	0.56	0.51	0.60	32.9
14	R2	17	2.0	19	2.0	0.461	8.8	LOS A	2.5	64.5	0.56	0.50	0.59	32.3
Approach		826	2.0	918	2.0	0.461	9.0	LOS A	2.7	67.6	0.57	0.52	0.61	32.5
West: Chestnut Ln														
5	L2	9	2.0	10	2.0	0.050	7.9	LOS A	0.2	4.0	0.66	0.66	0.66	32.8
2	T1	6	2.0	7	2.0	0.050	7.9	LOS A	0.2	4.0	0.66	0.66	0.66	32.7
12	R2	7	2.0	8	2.0	0.050	7.9	LOS A	0.2	4.0	0.66	0.66	0.66	31.8
Approach		22	2.0	24	2.0	0.050	7.9	LOS A	0.2	4.0	0.66	0.66	0.66	32.4
All Vehicles		2103	2.0	2337	2.0	0.461	8.2	LOS A	2.7	67.6	0.55	0.48	0.56	32.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

 Site: 1 [2032 Build w Imp +5 AM (Site Folder: General)]

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	10	2.0	13	2.0	0.671	12.5	LOS B	7.7	195.3	0.64	0.53	0.77	31.7
8	T1	640	2.0	771	2.0	0.671	12.5	LOS B	7.7	195.3	0.64	0.53	0.77	31.6
18	R2	321	2.0	387	2.0	0.331	6.3	LOS A	1.7	42.8	0.39	0.27	0.39	33.4
Approach		971	2.0	1171	2.0	0.671	10.4	LOS B	7.7	195.3	0.56	0.44	0.64	32.2
East: Chestnut Ln														
1	L2	593	3.0	741	3.0	0.838	31.7	LOS D	10.6	269.5	0.92	1.41	2.46	24.0
6	T1	7	2.0	8	2.0	0.838	31.5	LOS D	10.6	269.5	0.92	1.41	2.46	24.4
16	R2	309	2.0	343	2.0	0.838	31.5	LOS D	10.6	269.5	0.92	1.41	2.46	23.9
Approach		909	2.7	1092	2.7	0.838	31.6	LOS D	10.6	269.5	0.92	1.41	2.46	23.9
North: Matthews Weddington Rd														
7	L2	131	2.0	146	2.0	0.509	13.8	LOS B	3.0	76.4	0.73	0.86	1.13	30.2
4	T1	405	2.0	540	2.0	0.509	13.1	LOS B	3.0	77.4	0.72	0.84	1.11	31.0
14	R2	5	2.0	6	2.0	0.509	12.7	LOS B	3.0	77.4	0.71	0.84	1.10	30.6
Approach		541	2.0	691	2.0	0.509	13.2	LOS B	3.0	77.4	0.72	0.85	1.11	30.9
West: Chestnut Ln														
5	L2	23	2.0	26	2.0	0.161	11.5	LOS B	0.5	13.1	0.75	0.75	0.75	31.2
2	T1	16	2.0	18	2.0	0.161	11.5	LOS B	0.5	13.1	0.75	0.75	0.75	31.1
12	R2	16	2.0	21	2.0	0.161	11.5	LOS B	0.5	13.1	0.75	0.75	0.75	30.3
Approach		55	2.0	65	2.0	0.161	11.5	LOS B	0.5	13.1	0.75	0.75	0.75	30.9
All Vehicles		2476	2.2	3019	2.2	0.838	18.8	LOS C	10.6	269.5	0.73	0.89	1.41	28.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

MOVEMENT SUMMARY

 Site: 1 [2032 Build w Imp +5 PM (Site Folder: General)]

Matthews Weddington Rd & Chestnut Ln

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	31	2.0	34	2.0	0.492	9.2	LOS A	3.0	77.5	0.58	0.51	0.62	33.1
8	T1	431	2.0	479	2.0	0.492	9.2	LOS A	3.0	77.5	0.58	0.51	0.62	33.0
18	R2	468	2.0	520	2.0	0.498	9.3	LOS A	3.2	81.1	0.59	0.52	0.64	31.9
Approach		930	2.0	1033	2.0	0.498	9.3	LOS A	3.2	81.1	0.58	0.51	0.63	32.5
East: Chestnut Ln														
1	L2	291	2.0	323	2.0	0.286	7.3	LOS A	1.2	31.2	0.58	0.55	0.58	32.0
6	T1	16	2.0	18	2.0	0.286	7.3	LOS A	1.2	31.2	0.58	0.55	0.58	33.1
16	R2	134	2.0	149	2.0	0.286	7.3	LOS A	1.2	31.2	0.58	0.55	0.58	32.1
Approach		441	2.0	490	2.0	0.286	7.3	LOS A	1.2	31.2	0.58	0.55	0.58	32.1
North: Matthews Weddington Rd														
7	L2	262	2.0	291	2.0	0.520	10.6	LOS B	3.8	97.5	0.63	0.67	0.84	31.2
4	T1	626	2.0	696	2.0	0.520	10.2	LOS B	3.8	97.5	0.62	0.64	0.81	32.3
14	R2	18	2.0	20	2.0	0.520	10.0	LOS A	3.8	96.0	0.61	0.63	0.80	31.8
Approach		906	2.0	1007	2.0	0.520	10.3	LOS B	3.8	97.5	0.62	0.65	0.82	31.9
West: Chestnut Ln														
5	L2	10	2.0	11	2.0	0.062	8.9	LOS A	0.2	5.0	0.69	0.69	0.69	32.4
2	T1	7	2.0	8	2.0	0.062	8.9	LOS A	0.2	5.0	0.69	0.69	0.69	32.3
12	R2	8	2.0	9	2.0	0.062	8.9	LOS A	0.2	5.0	0.69	0.69	0.69	31.4
Approach		25	2.0	28	2.0	0.062	8.9	LOS A	0.2	5.0	0.69	0.69	0.69	32.0
All Vehicles		2302	2.0	2558	2.0	0.520	9.3	LOS A	3.8	97.5	0.60	0.58	0.69	32.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\1 - MatthewsWeddington_Chestnut\MatthewsWeddington_Chestnut.sip9

```

Exit: NORTH
Lane: 1      1119.0    22.8   1141.9
Total      1119.0    22.8   1141.9
-----
Exit: WEST
Lane: 1      24.9     0.5    25.4
Total      24.9     0.5    25.4
-----

```

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

[Go to Table Links \(Top\)](#)

For other Output reports and displays on Flow Rates, see the commands in the Site Reports and Network Site Reports tab ribbons.

Demand Analysis

Demand Analysis (Design Life / Flow Scale) Results Site: 2027 Build w Imp AM

Site ID: 1
Roundabout

Design Life Analysis - Specified Target: Zero Practical Spare Capacity
Results are reported for year 5 based on specified target.

Results in the table below are given for Intersection - Vehicles

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	3876	0.713	19	13.7	0.73	6.8	97.3	1203.8
1	3824	0.737	15	14.5	0.76	7.4	101.8	1238.6
2	3771	0.762	12	15.4	0.79	8.0	107.8	1275.4
3	3720	0.787	8	16.4	0.83	8.7	114.5	1314.3
4	3669	0.813	5	17.6	0.87	9.6	121.8	1355.8
5	3619	0.840	1	19.0	0.91	10.6	129.9	1400.4
6	3570	0.867	-2	20.5	0.96	11.9	138.9	1448.8
7	3521	0.894	-5	22.4	1.01	13.4	149.0	1501.8
8	3473	0.923	-8	24.6	1.07	15.2	160.6	1560.1
9	3426	0.951	-11	27.1	1.14	17.4	173.8	1624.6
10	3379	0.981	-13	30.0	1.22	20.1	188.9	1696.0

[Go to Table Links \(Top\)](#)

For other Output reports and displays on Demand Analysis, see the commands in the Site Reports and Network Site Reports tab ribbons.

Other

Parameter Settings Summary Site: 2027 Build w Imp AM

Site ID: 1
Roundabout

* Basic Parameters:
Intersection Type: Roundabout
US HCM 6 Roundabout Capacity Model used
Driving on the right-hand side of the road
Input data specified in US units
Model Defaults: US HCM (Customary)


```

Exit: NORTH
Lane: 1      801.9    16.4    818.2
Total      801.9    16.4    818.2
-----
Exit: WEST
Lane: 1      91.5     1.9     93.3
Total      91.5     1.9     93.3
-----

```

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

[Go to Table Links \(Top\)](#)

For other Output reports and displays on Flow Rates, see the commands in the Site Reports and Network Site Reports tab ribbons.

Demand Analysis

Demand Analysis (Design Life / Flow Scale) Results

Site: 2027 Build w Imp PM

Site ID: 1
Roundabout

Design Life Analysis - Specified Target: Zero Practical Spare Capacity
Results are reported for year 20 based on specified target.

The Design Life target was not reached by the final year in the Design Life Analysis. Results are reported for the final year.

Results in the table below are given for Intersection - Vehicles

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	5063	0.461	84	8.2	0.48	2.7	63.6	945.2
1	5032	0.474	79	8.4	0.50	2.9	65.9	966.8
2	5001	0.486	75	8.6	0.51	3.1	68.2	988.6
3	4970	0.498	71	8.9	0.53	3.4	70.5	1010.6
4	4939	0.511	66	9.1	0.56	3.7	73.1	1032.9
5	4908	0.524	62	9.3	0.58	3.9	76.1	1055.5
6	4878	0.537	58	9.6	0.61	4.2	79.2	1078.4
7	4847	0.550	55	9.9	0.63	4.5	82.4	1101.5
8	4817	0.563	51	10.2	0.66	4.8	85.6	1124.9
9	4787	0.576	48	10.5	0.68	5.1	88.9	1148.6
10	4758	0.589	44	10.8	0.71	5.4	92.3	1172.7
11	4728	0.603	41	11.1	0.74	5.7	95.8	1197.1
12	4699	0.617	38	11.5	0.76	6.1	99.5	1222.0
13	4669	0.631	35	11.8	0.79	6.5	103.4	1247.3
14	4640	0.645	32	12.2	0.82	6.9	107.3	1273.1
15	4612	0.659	29	12.6	0.85	7.3	111.4	1299.4
16	4583	0.673	26	13.1	0.88	7.7	115.7	1326.3
17	4555	0.687	24	13.6	0.91	8.2	120.1	1353.8
18	4526	0.702	21	14.1	0.94	8.7	124.7	1382.0
19	4498	0.717	19	14.6	0.97	9.2	129.5	1411.0
20	4470	0.732	16	15.2	1.00	9.8	134.5	1440.9

[Go to Table Links \(Top\)](#)

For other Output reports and displays on Demand Analysis, see the commands in the Site Reports and Network Site Reports tab ribbons.

Other

Parameter Settings Summary

MOVEMENT SUMMARY

 **Site: 4 [2025 Existing AM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	339	2.0	377	2.0	0.680	16.9	LOS C	6.9	175.4	0.81	1.07	1.54	28.6
8	T1	102	3.0	167	3.0	0.680	16.9	LOS C	6.9	175.4	0.81	1.07	1.54	28.5
18	R2	299	2.0	332	2.0	0.414	9.7	LOS A	2.2	56.4	0.66	0.71	0.81	31.8
Approach		740	2.1	876	2.2	0.680	14.2	LOS B	6.9	175.4	0.75	0.93	1.26	29.6
East: Matthews Weddington Rd														
1	L2	279	2.0	310	2.0	0.416	10.3	LOS B	2.2	55.9	0.68	0.74	0.87	30.4
6	T1	579	2.0	643	2.0	1.206	125.1	LOS F	67.5	1715.2	1.00	3.60	8.69	12.3
16	R2	158	2.0	255	2.0	1.206	125.1	LOS F	67.5	1715.2	1.00	3.60	8.69	12.2
Approach		1016	2.0	1208	2.0	1.206	95.6	LOS F	67.5	1715.2	0.92	2.87	6.69	14.5
North: Union Day School														
7	L2	129	2.0	258	2.0	0.777	32.8	LOS D	5.9	148.9	0.89	1.23	2.10	23.9
4	T1	60	2.0	115	2.0	0.777	32.8	LOS D	5.9	148.9	0.89	1.23	2.10	23.8
14	R2	102	2.0	185	2.0	0.443	17.4	LOS C	1.9	48.9	0.79	0.89	1.15	28.6
Approach		291	2.0	559	2.0	0.777	27.7	LOS D	5.9	148.9	0.85	1.11	1.79	25.2
West: Tilley Morris Rd														
5	L2	73	2.0	128	2.0	0.454	11.2	LOS B	2.6	65.7	0.69	0.78	0.96	31.4
2	T1	183	4.0	203	4.0	0.454	11.3	LOS B	2.6	65.7	0.69	0.78	0.96	31.2
12	R2	52	4.0	58	4.0	0.080	5.8	LOS A	0.3	7.3	0.55	0.51	0.55	33.6
Approach		308	3.5	389	3.3	0.454	10.4	LOS B	2.6	65.7	0.67	0.74	0.90	31.6
All Vehicles		2355	2.2	3032	2.2	1.206	48.6	LOS E	67.5	1715.2	0.83	1.71	3.47	20.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 4 [2025 Existing PM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	63	3.0	70	3.0	0.260	9.3	LOS A	1.0	25.3	0.66	0.66	0.66	32.1
8	T1	47	2.0	89	2.0	0.260	9.3	LOS A	1.0	25.3	0.66	0.66	0.66	32.0
18	R2	200	2.0	222	2.0	0.363	11.0	LOS B	1.6	41.6	0.69	0.74	0.86	31.2
Approach		310	2.2	381	2.2	0.363	10.3	LOS B	1.6	41.6	0.68	0.71	0.78	31.5
East: Matthews Weddington Rd														
1	L2	228	2.0	253	2.0	0.233	5.5	LOS A	1.0	26.4	0.42	0.31	0.42	32.5
6	T1	293	2.0	326	2.0	0.462	8.4	LOS A	2.6	66.7	0.53	0.42	0.53	33.5
16	R2	138	2.0	177	2.0	0.462	8.4	LOS A	2.6	66.7	0.53	0.42	0.53	32.4
Approach		659	2.0	756	2.0	0.462	7.5	LOS A	2.6	66.7	0.49	0.38	0.49	32.9
North: Union Day School														
7	L2	145	2.0	246	2.0	0.460	10.7	LOS B	2.6	66.8	0.67	0.76	0.93	31.0
4	T1	63	2.0	119	2.0	0.460	10.7	LOS B	2.6	66.8	0.67	0.76	0.93	30.9
14	R2	66	2.0	108	2.0	0.150	6.6	LOS A	0.6	14.1	0.56	0.55	0.56	33.2
Approach		274	2.0	473	2.0	0.460	9.7	LOS A	2.6	66.8	0.64	0.71	0.84	31.4
West: Tilley Morris Rd														
5	L2	70	2.0	108	2.0	0.816	25.5	LOS D	12.0	305.7	0.93	1.39	2.25	26.6
2	T1	479	2.0	532	2.0	0.816	25.5	LOS D	12.0	305.7	0.93	1.39	2.25	26.5
12	R2	167	2.0	186	2.0	0.237	7.2	LOS A	1.0	24.3	0.59	0.58	0.59	32.9
Approach		716	2.0	825	2.0	0.816	21.4	LOS C	12.0	305.7	0.85	1.21	1.88	27.7
All Vehicles		1959	2.0	2435	2.0	0.816	13.1	LOS B	12.0	305.7	0.67	0.78	1.07	30.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 4 [2027 No Build AM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	353	2.0	392	2.0	0.723	19.2	LOS C	8.0	204.2	0.85	1.15	1.72	27.8
8	T1	106	3.0	174	3.0	0.723	19.3	LOS C	8.0	204.2	0.85	1.15	1.72	27.7
18	R2	311	2.0	346	2.0	0.440	10.3	LOS B	2.5	63.4	0.67	0.75	0.88	31.5
Approach		770	2.1	912	2.2	0.723	15.9	LOS C	8.0	204.2	0.78	1.00	1.41	29.0
East: Matthews Weddington Rd														
1	L2	290	2.0	322	2.0	0.444	11.1	LOS B	2.5	62.6	0.69	0.78	0.94	30.1
6	T1	602	2.0	669	2.0	1.285	157.7	LOS F	82.7	2100.7	1.00	4.12	10.36	10.5
16	R2	164	2.0	265	2.0	1.285	157.7	LOS F	82.7	2100.7	1.00	4.12	10.36	10.3
Approach		1056	2.0	1256	2.0	1.285	120.1	LOS F	82.7	2100.7	0.92	3.26	7.95	12.6
North: Union Day School														
7	L2	134	2.0	268	2.0	0.818	37.5	LOS E	6.8	171.7	0.90	1.31	2.35	22.8
4	T1	62	2.0	119	2.0	0.818	37.5	LOS E	6.8	171.7	0.90	1.31	2.35	22.7
14	R2	106	2.0	193	2.0	0.468	18.5	LOS C	2.1	52.7	0.80	0.91	1.20	28.2
Approach		302	2.0	580	2.0	0.818	31.2	LOS D	6.8	171.7	0.87	1.17	1.97	24.3
West: Tilley Morris Rd														
5	L2	76	2.0	133	2.0	0.484	12.1	LOS B	2.9	73.4	0.71	0.82	1.04	31.0
2	T1	190	4.0	211	4.0	0.484	12.2	LOS B	2.9	73.4	0.71	0.82	1.04	30.9
12	R2	54	4.0	60	4.0	0.085	6.0	LOS A	0.3	7.8	0.56	0.53	0.56	33.5
Approach		320	3.5	404	3.3	0.484	11.2	LOS B	2.9	73.4	0.69	0.78	0.97	31.3
All Vehicles		2448	2.2	3152	2.2	1.285	59.6	LOS F	82.7	2100.7	0.84	1.91	4.06	18.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 No Build PM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	66	3.0	73	3.0	0.281	9.9	LOS A	1.1	27.6	0.67	0.68	0.69	31.8
8	T1	49	2.0	92	2.0	0.281	9.9	LOS A	1.1	27.6	0.67	0.68	0.69	31.7
18	R2	208	2.0	231	2.0	0.391	11.9	LOS B	1.8	46.3	0.71	0.78	0.93	30.8
Approach		323	2.2	397	2.2	0.391	11.0	LOS B	1.8	46.3	0.69	0.73	0.83	31.2
East: Matthews Weddington Rd														
1	L2	237	2.0	263	2.0	0.245	5.7	LOS A	1.1	28.0	0.43	0.33	0.43	32.4
6	T1	305	2.0	339	2.0	0.487	8.9	LOS A	2.8	71.8	0.56	0.45	0.56	33.2
16	R2	144	2.0	185	2.0	0.487	8.9	LOS A	2.8	71.8	0.56	0.45	0.56	32.2
Approach		686	2.0	787	2.0	0.487	7.8	LOS A	2.8	71.8	0.51	0.41	0.51	32.7
North: Union Day School														
7	L2	151	2.0	256	2.0	0.491	11.5	LOS B	3.0	75.5	0.69	0.80	1.01	30.6
4	T1	66	2.0	125	2.0	0.491	11.5	LOS B	3.0	75.5	0.69	0.80	1.01	30.5
14	R2	69	2.0	113	2.0	0.161	6.9	LOS A	0.6	15.1	0.57	0.57	0.57	33.1
Approach		286	2.0	494	2.0	0.491	10.5	LOS B	3.0	75.5	0.66	0.75	0.91	31.1
West: Tilley Morris Rd														
5	L2	73	2.0	112	2.0	0.869	31.6	LOS D	15.0	381.2	0.98	1.57	2.70	24.9
2	T1	498	2.0	553	2.0	0.869	31.6	LOS D	15.0	381.2	0.98	1.57	2.70	24.8
12	R2	174	2.0	193	2.0	0.252	7.5	LOS A	1.0	26.0	0.60	0.60	0.60	32.8
Approach		745	2.0	859	2.0	0.869	26.2	LOS D	15.0	381.2	0.89	1.35	2.23	26.2
All Vehicles		2040	2.0	2536	2.0	0.869	15.1	LOS C	15.0	381.2	0.70	0.85	1.22	29.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 Build AM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	353	2.0	392	2.0	0.744	20.8	LOS C	8.5	215.2	0.87	1.20	1.84	27.3
8	T1	106	3.0	174	3.0	0.744	20.9	LOS C	8.5	215.2	0.87	1.20	1.84	27.2
18	R2	332	2.0	369	2.0	0.483	11.5	LOS B	3.0	75.8	0.70	0.81	1.00	31.0
Approach		791	2.1	935	2.2	0.744	17.1	LOS C	8.5	215.2	0.80	1.04	1.51	28.6
East: Matthews Weddington Rd														
1	L2	315	2.0	350	2.0	0.482	11.9	LOS B	2.9	73.4	0.71	0.82	1.03	29.8
6	T1	636	2.0	707	2.0	1.337	179.3	LOS F	94.2	2392.3	1.00	4.46	11.36	9.5
16	R2	164	2.0	265	2.0	1.337	179.3	LOS F	94.2	2392.3	1.00	4.46	11.36	9.4
Approach		1115	2.0	1321	2.0	1.337	135.0	LOS F	94.2	2392.3	0.92	3.49	8.62	11.6
North: Union Day School														
7	L2	134	2.0	268	2.0	0.845	41.9	LOS E	7.3	186.5	0.92	1.37	2.55	21.9
4	T1	62	2.0	119	2.0	0.845	41.9	LOS E	7.3	186.5	0.92	1.37	2.55	21.8
14	R2	106	2.0	193	2.0	0.484	19.6	LOS C	2.2	54.8	0.81	0.93	1.24	27.8
Approach		302	2.0	580	2.0	0.845	34.5	LOS D	7.3	186.5	0.88	1.22	2.12	23.5
West: Tilley Morris Rd														
5	L2	76	2.0	133	2.0	0.540	13.7	LOS B	3.5	90.1	0.74	0.89	1.19	30.4
2	T1	217	4.0	241	4.0	0.540	13.8	LOS B	3.5	90.1	0.74	0.89	1.19	30.3
12	R2	54	4.0	60	4.0	0.087	6.2	LOS A	0.3	8.0	0.57	0.54	0.57	33.4
Approach		347	3.6	434	3.4	0.540	12.8	LOS B	3.5	90.1	0.72	0.84	1.10	30.7
All Vehicles		2555	2.3	3270	2.2	1.337	67.2	LOS F	94.2	2392.3	0.85	2.04	4.44	17.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 Build PM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	66	3.0	73	3.0	0.294	10.5	LOS B	1.2	29.4	0.68	0.70	0.74	31.6
8	T1	49	2.0	92	2.0	0.294	10.5	LOS B	1.2	29.4	0.68	0.70	0.74	31.5
18	R2	239	2.0	266	2.0	0.469	14.2	LOS B	2.4	61.4	0.74	0.85	1.10	29.8
Approach		354	2.2	431	2.2	0.469	12.8	LOS B	2.4	61.4	0.72	0.79	0.96	30.5
East: Matthews Weddington Rd														
1	L2	262	2.0	291	2.0	0.271	5.9	LOS A	1.2	31.7	0.44	0.34	0.44	32.2
6	T1	338	2.0	376	2.0	0.521	9.5	LOS A	3.5	88.3	0.58	0.49	0.62	32.9
16	R2	144	2.0	185	2.0	0.521	9.5	LOS A	3.5	88.3	0.58	0.49	0.62	31.9
Approach		744	2.0	851	2.0	0.521	8.3	LOS A	3.5	88.3	0.53	0.44	0.56	32.5
North: Union Day School														
7	L2	151	2.0	256	2.0	0.519	12.7	LOS B	3.2	81.9	0.71	0.84	1.11	30.2
4	T1	66	2.0	125	2.0	0.519	12.7	LOS B	3.2	81.9	0.71	0.84	1.11	30.1
14	R2	69	2.0	113	2.0	0.171	7.4	LOS A	0.6	15.9	0.59	0.59	0.59	32.8
Approach		286	2.0	494	2.0	0.519	11.5	LOS B	3.2	81.9	0.69	0.79	0.99	30.7
West: Tilley Morris Rd														
5	L2	73	2.0	112	2.0	0.954	46.0	LOS E	22.5	571.9	1.00	1.92	3.71	21.5
2	T1	540	2.0	600	2.0	0.954	46.0	LOS E	22.5	571.9	1.00	1.92	3.71	21.5
12	R2	174	2.0	193	2.0	0.259	7.8	LOS A	1.0	26.6	0.61	0.61	0.61	32.6
Approach		787	2.0	906	2.0	0.954	37.8	LOS E	22.5	571.9	0.92	1.64	3.05	23.1
All Vehicles		2171	2.0	2682	2.0	0.954	19.6	LOS C	22.5	571.9	0.72	0.97	1.55	28.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 Build AM - Reduced Trip Gen and Dist (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	353	2.0	392	2.0	0.733	20.0	LOS C	8.2	209.7	0.86	1.18	1.78	27.5
8	T1	106	3.0	174	3.0	0.733	20.1	LOS C	8.2	209.7	0.86	1.18	1.78	27.4
18	R2	330	2.0	367	2.0	0.474	11.1	LOS B	2.9	73.3	0.69	0.79	0.97	31.1
Approach		789	2.1	933	2.2	0.733	16.5	LOS C	8.2	209.7	0.79	1.02	1.46	28.8
East: Matthews Weddington Rd														
1	L2	314	2.0	349	2.0	0.480	11.9	LOS B	2.9	73.0	0.71	0.82	1.03	29.8
6	T1	622	2.0	691	2.0	1.316	170.4	LOS F	89.4	2271.7	1.00	4.32	10.96	9.9
16	R2	164	2.0	265	2.0	1.316	170.4	LOS F	89.4	2271.7	1.00	4.32	10.96	9.8
Approach		1100	2.0	1305	2.0	1.316	128.0	LOS F	89.4	2271.7	0.92	3.38	8.30	12.1
North: Union Day School														
7	L2	134	2.0	268	2.0	0.841	41.3	LOS E	7.3	184.4	0.92	1.36	2.52	22.0
4	T1	62	2.0	119	2.0	0.841	41.3	LOS E	7.3	184.4	0.92	1.36	2.52	21.9
14	R2	106	2.0	193	2.0	0.482	19.4	LOS C	2.1	54.6	0.81	0.93	1.24	27.9
Approach		302	2.0	580	2.0	0.841	34.0	LOS D	7.3	184.4	0.88	1.22	2.09	23.6
West: Tilley Morris Rd														
5	L2	76	2.0	133	2.0	0.518	13.2	LOS B	3.2	83.0	0.73	0.86	1.13	30.6
2	T1	204	4.0	227	4.0	0.518	13.3	LOS B	3.2	83.0	0.73	0.86	1.13	30.5
12	R2	54	4.0	60	4.0	0.087	6.2	LOS A	0.3	8.0	0.57	0.54	0.57	33.4
Approach		334	3.5	420	3.4	0.518	12.2	LOS B	3.2	83.0	0.71	0.82	1.05	30.9
All Vehicles		2525	2.2	3237	2.2	1.316	64.0	LOS F	89.4	2271.7	0.85	1.98	4.28	18.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2027 Build PM - Reduced Trip Gen and Dist (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	66	3.0	73	3.0	0.288	10.2	LOS B	1.1	28.5	0.68	0.69	0.72	31.7
8	T1	49	2.0	92	2.0	0.288	10.2	LOS B	1.1	28.5	0.68	0.69	0.72	31.6
18	R2	234	2.0	260	2.0	0.449	13.4	LOS B	2.3	57.8	0.73	0.83	1.06	30.1
Approach		349	2.2	426	2.2	0.449	12.2	LOS B	2.3	57.8	0.71	0.77	0.92	30.7
East: Matthews Weddington Rd														
1	L2	257	2.0	286	2.0	0.266	5.9	LOS A	1.2	30.9	0.44	0.34	0.44	32.3
6	T1	321	2.0	357	2.0	0.504	9.2	LOS A	3.0	77.0	0.57	0.46	0.58	33.1
16	R2	144	2.0	185	2.0	0.504	9.2	LOS A	3.0	77.0	0.57	0.46	0.58	32.1
Approach		722	2.0	827	2.0	0.504	8.1	LOS A	3.0	77.0	0.52	0.42	0.53	32.6
North: Union Day School														
7	L2	151	2.0	256	2.0	0.509	12.2	LOS B	3.1	79.5	0.70	0.83	1.08	30.4
4	T1	66	2.0	125	2.0	0.509	12.2	LOS B	3.1	79.5	0.70	0.83	1.08	30.3
14	R2	69	2.0	113	2.0	0.167	7.2	LOS A	0.6	15.6	0.59	0.59	0.59	32.9
Approach		286	2.0	494	2.0	0.509	11.1	LOS B	3.1	79.5	0.68	0.77	0.96	30.9
West: Tilley Morris Rd														
5	L2	73	2.0	112	2.0	0.920	39.4	LOS E	18.9	479.5	1.00	1.77	3.26	22.9
2	T1	520	2.0	578	2.0	0.920	39.4	LOS E	18.9	479.5	1.00	1.77	3.26	22.9
12	R2	174	2.0	193	2.0	0.258	7.7	LOS A	1.0	26.5	0.61	0.61	0.61	32.7
Approach		767	2.0	883	2.0	0.920	32.5	LOS D	18.9	479.5	0.91	1.51	2.68	24.4
All Vehicles		2124	2.0	2630	2.0	0.920	17.5	LOS C	18.9	479.5	0.71	0.91	1.40	28.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 Site: 4 [2032 Build +5 AM (Site Folder: General)]

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	389	2.0	432	2.0	0.856	31.2	LOS D	13.2	335.9	0.96	1.51	2.60	24.3
8	T1	117	3.0	192	3.0	0.856	31.2	LOS D	13.2	335.9	0.96	1.51	2.60	24.2
18	R2	362	2.0	402	2.0	0.550	13.5	LOS B	3.8	96.9	0.75	0.90	1.19	30.1
Approach		868	2.1	1026	2.2	0.856	24.3	LOS C	13.2	335.9	0.87	1.27	2.05	26.2
East: Matthews Weddington Rd														
1	L2	344	2.0	382	2.0	0.563	14.7	LOS B	3.8	96.2	0.76	0.92	1.25	28.8
6	T1	685	2.0	761	2.0	1.551	272.2	LOS F	132.7	3370.8	1.00	5.52	15.01	6.8
16	R2	181	2.0	292	2.0	1.551	272.2	LOS F	132.7	3370.8	1.00	5.52	15.01	6.8
Approach		1210	2.0	1435	2.0	1.551	203.6	LOS F	132.7	3370.8	0.94	4.30	11.35	8.6
North: Union Day School														
7	L2	148	2.0	296	2.0	0.961	63.8	LOS F	12.6	320.6	0.97	1.76	3.85	18.1
4	T1	69	2.0	133	2.0	0.961	63.8	LOS F	12.6	320.6	0.97	1.76	3.85	18.1
14	R2	117	2.0	213	2.0	0.551	22.9	LOS C	2.6	66.7	0.84	0.99	1.39	26.7
Approach		334	2.0	641	2.0	0.961	50.2	LOS F	12.6	320.6	0.93	1.50	3.03	20.2
West: Tilley Morris Rd														
5	L2	84	2.0	147	2.0	0.609	16.8	LOS C	4.3	111.2	0.79	0.98	1.39	29.2
2	T1	224	4.0	249	4.0	0.609	16.9	LOS C	4.3	111.2	0.79	0.98	1.39	29.1
12	R2	60	4.0	67	4.0	0.103	6.8	LOS A	0.4	9.4	0.60	0.59	0.60	33.1
Approach		368	3.5	463	3.4	0.609	15.4	LOS C	4.3	111.2	0.76	0.92	1.28	29.6
All Vehicles		2780	2.2	3566	2.2	1.551	100.0	LOS F	132.7	3370.8	0.89	2.48	5.87	14.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: G:\SDSKPROJ\1134-001 The Cottage Green Stallings Pre-TIA & TIA\SIDRA\4 - MatthewsWeddington_TilleyMorris\MatthewsWeddington_TilleyMorris.sip9

MOVEMENT SUMMARY

 **Site: 4 [2032 Build +5 PM (Site Folder: General)]**

Matthews Weddington Rd & Tilley Morris Rd

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh ft		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Matthews Weddington Rd														
3	L2	72	3.0	80	3.0	0.330	11.4	LOS B	1.4	34.7	0.70	0.74	0.83	31.2
8	T1	54	2.0	102	2.0	0.330	11.3	LOS B	1.4	34.7	0.70	0.74	0.83	31.1
18	R2	256	2.0	284	2.0	0.515	15.7	LOS C	2.8	71.0	0.76	0.89	1.20	29.2
Approach		382	2.2	466	2.2	0.515	14.0	LOS B	2.8	71.0	0.73	0.83	1.06	30.0
East: Matthews Weddington Rd														
1	L2	282	2.0	313	2.0	0.297	6.3	LOS A	1.4	35.3	0.47	0.37	0.47	32.1
6	T1	353	2.0	392	2.0	0.565	10.6	LOS B	4.9	123.4	0.63	0.60	0.80	32.5
16	R2	159	2.0	204	2.0	0.565	10.6	LOS B	4.9	123.4	0.63	0.60	0.80	31.5
Approach		794	2.0	909	2.0	0.565	9.1	LOS A	4.9	123.4	0.57	0.52	0.68	32.1
North: Union Day School														
7	L2	167	2.0	283	2.0	0.595	15.3	LOS C	4.2	106.0	0.76	0.94	1.32	29.2
4	T1	72	2.0	136	2.0	0.595	15.3	LOS C	4.2	106.0	0.76	0.94	1.32	29.1
14	R2	76	2.0	125	2.0	0.197	8.1	LOS A	0.7	18.4	0.61	0.61	0.61	32.5
Approach		315	2.0	543	2.0	0.595	13.7	LOS B	4.2	106.0	0.73	0.86	1.16	29.8
West: Tilley Morris Rd														
5	L2	80	2.0	123	2.0	1.075	79.5	LOS F	38.5	976.9	1.00	2.63	5.96	16.4
2	T1	572	2.0	636	2.0	1.075	79.5	LOS F	38.5	976.9	1.00	2.63	5.96	16.3
12	R2	192	2.0	213	2.0	0.302	8.8	LOS A	1.2	31.3	0.64	0.64	0.64	32.2
Approach		844	2.0	972	2.0	1.075	64.0	LOS F	38.5	976.9	0.92	2.19	4.80	18.3
All Vehicles		2335	2.0	2891	2.0	1.075	29.2	LOS D	38.5	976.9	0.74	1.20	2.22	25.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Demand Analysis

Demand Analysis (Design Life / Flow Scale) Results Site: 2025 Existing PM

Site ID: 4
Roundabout

Design Life Analysis - Specified Target: Zero Practical Spare Capacity
Results are reported for year 1 based on specified target.

Results in the table below are given for Intersection - Vehicles

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	2985	0.816	4	13.1	0.78	12.0	90.8	1046.7
1	2951	0.842	1	14.0	0.81	13.4	95.8	1078.1
2	2917	0.868	-2	15.0	0.84	15.0	101.3	1111.6

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2025 Existing
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	23	14	492	6	269	9	521	251	114	322	4
Future Volume (vph)	20	23	14	492	6	269	9	521	251	114	322	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962				0.850			0.850		0.999	
Flt Protected		0.984			0.953			0.999		0.950		
Satd. Flow (prot)	0	1763	0	0	1758	1583	0	1861	1583	1770	1861	0
Flt Permitted		0.984			0.953			0.999		0.950		
Satd. Flow (perm)	0	1763	0	0	1758	1583	0	1861	1583	1770	1861	0
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1281			1441			496			1129	
Travel Time (s)		34.9			21.8			7.5			17.1	
Peak Hour Factor	0.90	0.90	0.75	0.80	0.90	0.90	0.75	0.83	0.83	0.90	0.75	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	22	26	19	615	7	299	12	628	302	127	429	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	622	299	0	640	302	127	433	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 89.3%

ICU Level of Service E

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2025 Existing
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh	14.0						
Intersection LOS	B						
Approach	EB	WB		NB		SB	
Entry Lanes	1	2		2		2	
Conflicting Circle Lanes	2	1		1		2	
Adj Approach Flow, veh/h	67	921		942		560	
Demand Flow Rate, veh/h	68	945		961		572	
Vehicles Circulating, veh/h	1201	675		179		652	
Vehicles Exiting, veh/h	23	465		1090		968	
Ped Vol Crossing Leg, #/h	0	0		0		0	
Ped Cap Adj	1.000	1.000		1.000		1.000	
Approach Delay, s/veh	8.8	22.2		8.0		11.2	
Approach LOS	A	C		A		B	
Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	LT	R	LT	R	L	TR
Assumed Moves	LTR	LT	R	LT	R	L	TR
RT Channelized							
Lane Util	1.000	0.677	0.323	0.680	0.320	0.227	0.773
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.544	4.544	4.544	4.544	4.645	4.328
Entry Flow, veh/h	68	640	305	653	308	130	442
Cap Entry Lane, veh/h	512	768	768	1207	1207	741	816
Entry HV Adj Factor	0.992	0.972	0.980	0.981	0.981	0.977	0.981
Flow Entry, veh/h	67	622	299	640	302	127	433
Cap Entry, veh/h	508	747	753	1183	1183	724	800
V/C Ratio	0.133	0.833	0.397	0.541	0.255	0.175	0.542
Control Delay, s/veh	8.8	28.2	9.9	9.3	5.4	6.9	12.4
LOS	A	D	A	A	A	A	B
95th %tile Queue, veh	0	9	2	3	1	1	3

The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2025 Existing
Timing Plan: AM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	369	317	464	180	186	644
Future Volume (vph)	369	317	464	180	186	644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275	0		0	250	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr t		0.850	0.962			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1787	0	1736	1863
Flt Permitted	0.950				0.082	
Satd. Flow (perm)	1770	1583	1787	0	150	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	45		45			45
Link Distance (ft)	1073		667			652
Travel Time (s)	16.3		10.1			9.9
Peak Hour Factor	0.82	0.90	0.75	0.75	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	4%	2%
Adj. Flow (vph)	450	352	619	240	207	716
Shared Lane Traffic (%)						
Lane Group Flow (vph)	450	352	859	0	207	716
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		20	6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Prot	NA		pm+pt	NA
Protected Phases	4	4	2		1	6

The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2025 Existing
Timing Plan: AM Peak

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases					6	
Detector Phase	4	4	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	14.0	14.0	19.0		14.0	19.0
Total Split (s)	27.0	27.0	49.0		14.0	63.0
Total Split (%)	30.0%	30.0%	54.4%		15.6%	70.0%
Maximum Green (s)	20.0	20.0	42.0		7.0	56.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	22.0	22.0	44.0		58.0	58.0
Actuated g/C Ratio	0.24	0.24	0.49		0.64	0.64
v/c Ratio	1.04	0.91	0.98		0.81	0.60
Control Delay	89.8	63.2	51.2		43.0	11.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	89.8	63.2	51.2		43.0	11.8
LOS	F	E	D		D	B
Approach Delay	78.1		51.2			18.8
Approach LOS	E		D			B

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 48.0

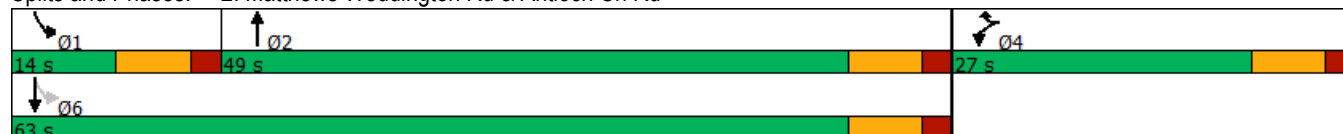
Intersection LOS: D

Intersection Capacity Utilization 78.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Matthews Weddington Rd & Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2025 Existing
Timing Plan: AM Peak

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	450	352	859	207	716
v/c Ratio	1.04	0.91	0.98	0.81	0.60
Control Delay	89.8	63.2	51.2	43.0	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	89.8	63.2	51.2	43.0	11.8
Queue Length 50th (ft)	~279	195	460	65	210
Queue Length 95th (ft)	#399	#357	475	#182	311
Internal Link Dist (ft)	993		587		572
Turn Bay Length (ft)	275			250	
Base Capacity (vph)	432	386	873	255	1200
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.04	0.91	0.98	0.81	0.60

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave & Matthews Weddington Rd

2025 Existing
Timing Plan: AM Peak

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	641	4	0	1012	0	5
Future Volume (vph)	641	4	0	1012	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999					0.865
Flt Protected						
Satd. Flow (prot)	1861	0	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1861	0	0	1863	0	1611
Link Speed (mph)	45			45	35	
Link Distance (ft)	2073			667	1113	
Travel Time (s)	31.4			10.1	21.7	
Peak Hour Factor	0.83	0.90	0.90	0.89	0.90	0.90
Adj. Flow (vph)	772	4	0	1137	0	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	776	0	0	1137	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	4			4	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 56.6%

ICU Level of Service B

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave & Matthews Weddington Rd

2025 Existing
Timing Plan: AM Peak

Intersection

Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑		↗
Traffic Vol, veh/h	641	4	0	1012	0	5
Future Vol, veh/h	641	4	0	1012	0	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	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	90	90	89	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	772	4	0	1137	0	6

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - - 774
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - - 3.318
Pot Cap-1 Maneuver	-	-	0 - 0 398
Stage 1	-	-	0 - 0
Stage 2	-	-	0 - 0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - - 398
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	398	-	-	-
HCM Lane V/C Ratio	0.014	-	-	-
HCM Control Delay (s)	14.2	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

The Cottage Green

4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2025 Existing

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	183	52	279	579	158	339	102	299	129	60	102
Future Volume (vph)	73	183	52	279	579	158	339	102	299	129	60	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.957				0.850			0.850
Flt Protected		0.981		0.950				0.967			0.967	
Satd. Flow (prot)	0	1806	1553	1770	1783	0	0	1796	1583	0	1801	1583
Flt Permitted		0.981		0.950				0.967			0.967	
Satd. Flow (perm)	0	1806	1553	1770	1783	0	0	1796	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.57	0.90	0.90	0.90	0.90	0.62	0.90	0.61	0.90	0.50	0.52	0.55
Heavy Vehicles (%)	2%	4%	4%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	128	203	58	310	643	255	377	167	332	258	115	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	331	58	310	898	0	0	544	332	0	373	185
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 94.6%

ICU Level of Service F

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2025 Existing
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh 48.1
Intersection LOS E

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	389		1208		876		558	
Demand Flow Rate, veh/h	402		1232		896		569	
Vehicles Circulating, veh/h	696		688		605		1357	
Vehicles Exiting, veh/h	1230		813		493		563	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	10.4		81.5		14.2		55.4	
Approach LOS	B		F		B		F	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.851	0.149	0.256	0.744	0.622	0.378	0.668	0.332
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	342	60	316	916	557	339	380	189
Cap Entry Lane, veh/h	754	754	717	791	819	819	387	448
Entry HV Adj Factor	0.967	0.967	0.981	0.980	0.977	0.979	0.981	0.979
Flow Entry, veh/h	331	58	310	898	544	332	373	185
Cap Entry, veh/h	729	729	703	776	800	802	380	439
V/C Ratio	0.454	0.080	0.441	1.158	0.680	0.414	0.981	0.422
Control Delay, s/veh	11.2	5.8	11.3	105.7	16.9	9.7	74.9	16.2
LOS	B	A	B	F	C	A	F	C
95th %tile Queue, veh	2	0	2	28	5	2	11	2

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2025 Existing
Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	6	7	217	14	117	27	339	379	228	500	16
Future Volume (vph)	9	6	7	217	14	117	27	339	379	228	500	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957				0.850			0.850		0.995	
Flt Protected		0.980			0.955			0.996		0.950		
Satd. Flow (prot)	0	1747	0	0	1779	1583	0	1855	1583	1770	1853	0
Flt Permitted		0.980			0.955			0.996		0.950		
Satd. Flow (perm)	0	1747	0	0	1779	1583	0	1855	1583	1770	1853	0
Link Speed (mph)		25			45			45		45		
Link Distance (ft)		1281			1441			496		1129		
Travel Time (s)		34.9			21.8			7.5		17.1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	7	8	241	16	130	30	377	421	253	556	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	0	0	257	130	0	407	421	253	574	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22		22		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 76.0%

ICU Level of Service D

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2025 Existing
Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh 7.5
Intersection LOS A

Approach	EB	WB	NB	SB
Entry Lanes	1	2	2	2
Conflicting Circle Lanes	2	1	1	2
Adj Approach Flow, veh/h	25	387	828	827
Demand Flow Rate, veh/h	25	395	845	843
Vehicles Circulating, veh/h	1071	426	275	293
Vehicles Exiting, veh/h	65	694	821	528
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.8	6.1	7.3	8.5
Approach LOS	A	A	A	A

Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	LT	R	LT	R	L	TR
Assumed Moves	LTR	LT	R	LT	R	L	TR
RT Channelized							
Lane Util	1.000	0.663	0.337	0.492	0.508	0.306	0.694
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.544	4.544	4.544	4.544	4.645	4.328
Entry Flow, veh/h	25	262	133	416	429	258	585
Cap Entry Lane, veh/h	571	964	964	1106	1106	1031	1107
Entry HV Adj Factor	0.995	0.980	0.977	0.979	0.981	0.981	0.981
Flow Entry, veh/h	25	257	130	407	421	253	574
Cap Entry, veh/h	568	944	942	1083	1085	1011	1086
V/C Ratio	0.044	0.272	0.138	0.376	0.388	0.250	0.528
Control Delay, s/veh	6.8	6.6	5.1	7.2	7.3	6.0	9.6
LOS	A	A	A	A	A	A	A
95th %tile Queue, veh	0	1	0	2	2	1	3

The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2025 Existing
Timing Plan: PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	159	203	535	301	303	412
Future Volume (vph)	159	203	535	301	303	412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275	0		0	250	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr t		0.850	0.951			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1771	0	1770	1863
Flt Permitted	0.950				0.083	
Satd. Flow (perm)	1770	1583	1771	0	155	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	45		45			45
Link Distance (ft)	1073		667			652
Travel Time (s)	16.3		10.1			9.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	177	226	594	334	337	458
Shared Lane Traffic (%)						
Lane Group Flow (vph)	177	226	928	0	337	458
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Prot	NA		pm+pt	NA
Protected Phases	4	4	2		1	6
Permitted Phases					6	

The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2025 Existing
Timing Plan: PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	14.0	14.0	19.0		14.0	19.0
Total Split (s)	18.0	18.0	56.0		16.0	72.0
Total Split (%)	20.0%	20.0%	62.2%		17.8%	80.0%
Maximum Green (s)	11.0	11.0	49.0		9.0	65.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	13.0	13.0	51.0		67.0	67.0
Actuated g/C Ratio	0.14	0.14	0.57		0.74	0.74
v/c Ratio	0.69	0.99	0.93		1.08	0.33
Control Delay	52.3	98.5	34.6		98.5	4.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	52.3	98.5	34.6		98.5	4.6
LOS	D	F	C		F	A
Approach Delay	78.2		34.6			44.4
Approach LOS	E		C			D

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 46.6

Intersection LOS: D

Intersection Capacity Utilization 84.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: Matthews Weddington Rd & Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2025 Existing
Timing Plan: PM Peak

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	177	226	928	337	458
v/c Ratio	0.69	0.99	0.93	1.08	0.33
Control Delay	52.3	98.5	34.6	98.5	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	98.5	34.6	98.5	4.6
Queue Length 50th (ft)	97	130	448	~156	72
Queue Length 95th (ft)	#187	#275	#740	#325	108
Internal Link Dist (ft)	993		587		572
Turn Bay Length (ft)	275			250	
Base Capacity (vph)	255	228	1003	312	1386
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.69	0.99	0.93	1.08	0.33

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave & Matthews Weddington Rd

2025 Existing
Timing Plan: PM Peak

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	787	10	0	632	0	4
Future Volume (vph)	787	10	0	632	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					0.865
Flt Protected						
Satd. Flow (prot)	1859	0	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1859	0	0	1863	0	1611
Link Speed (mph)	45			45	35	
Link Distance (ft)	2073			667	1113	
Travel Time (s)	31.4			10.1	21.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	874	11	0	702	0	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	885	0	0	702	0	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	4			4	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 52.0%

ICU Level of Service A

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave & Matthews Weddington Rd

2025 Existing
Timing Plan: PM Peak

Intersection

Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑		↗
Traffic Vol, veh/h	787	10	0	632	0	4
Future Vol, veh/h	787	10	0	632	0	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	-	-	-	-	-	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	874	11	0	702	0	4

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - - 880
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - - 3.318
Pot Cap-1 Maneuver	-	-	0 - 0 346
Stage 1	-	-	0 - 0 -
Stage 2	-	-	0 - 0 -
Platoon blocked, %	-	-	- - -
Mov Cap-1 Maneuver	-	-	- - - 346
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	346	-	-	-
HCM Lane V/C Ratio	0.013	-	-	-
HCM Control Delay (s)	15.5	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

The Cottage Green

4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2025 Existing

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	479	167	228	293	138	63	47	200	145	63	66
Future Volume (vph)	70	479	167	228	293	138	63	47	200	145	63	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.947				0.850			0.850
Flt Protected		0.992		0.950				0.978			0.967	
Satd. Flow (prot)	0	1848	1583	1770	1764	0	0	1814	1583	0	1801	1583
Flt Permitted		0.992		0.950				0.978			0.967	
Satd. Flow (perm)	0	1848	1583	1770	1764	0	0	1814	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.65	0.90	0.90	0.90	0.90	0.78	0.90	0.53	0.90	0.59	0.53	0.61
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Adj. Flow (vph)	108	532	186	253	326	177	70	89	222	246	119	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	640	186	253	503	0	0	159	222	0	365	108
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 80.9%

ICU Level of Service D

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2025 Existing
Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh 13.3
Intersection LOS B

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	826		756		381		473	
Demand Flow Rate, veh/h	843		772		389		482	
Vehicles Circulating, veh/h	630		273		904		663	
Vehicles Exiting, veh/h	515		1020		569		382	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	21.4		7.5		10.3		11.1	
Approach LOS	C		A		B		B	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.775	0.225	0.334	0.666	0.419	0.581	0.772	0.228
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	653	190	258	514	163	226	372	110
Cap Entry Lane, veh/h	800	800	1050	1126	624	624	734	808
Entry HV Adj Factor	0.981	0.979	0.981	0.980	0.977	0.982	0.980	0.982
Flow Entry, veh/h	640	186	253	503	159	222	365	108
Cap Entry, veh/h	785	784	1030	1103	609	613	719	794
V/C Ratio	0.816	0.237	0.246	0.456	0.261	0.362	0.507	0.136
Control Delay, s/veh	25.5	7.2	5.9	8.3	9.3	11.0	12.6	5.9
LOS	D	A	A	A	A	B	B	A
95th %tile Queue, veh	9	1	1	2	1	2	3	0

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 No Build
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	24	15	512	6	280	9	542	261	119	335	4
Future Volume (vph)	21	24	15	512	6	280	9	542	261	119	335	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961				0.850			0.850		0.999	
Flt Protected		0.984			0.953			0.999		0.950		
Satd. Flow (prot)	0	1761	0	0	1758	1583	0	1861	1583	1770	1861	0
Flt Permitted		0.984			0.953			0.999		0.950		
Satd. Flow (perm)	0	1761	0	0	1758	1583	0	1861	1583	1770	1861	0
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1281			1441			496			1129	
Travel Time (s)		34.9			21.8			7.5			17.1	
Peak Hour Factor	0.90	0.90	0.75	0.80	0.90	0.90	0.75	0.83	0.83	0.90	0.75	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	23	27	20	640	7	311	12	653	314	132	447	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	647	311	0	665	314	132	451	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 92.2%

ICU Level of Service F

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 No Build
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh 16.2
Intersection LOS C

Approach	EB	WB	NB	SB
Entry Lanes	1	2	2	2
Conflicting Circle Lanes	2	1	1	2
Adj Approach Flow, veh/h	70	958	979	583
Demand Flow Rate, veh/h	71	983	998	595
Vehicles Circulating, veh/h	1250	701	186	678
Vehicles Exiting, veh/h	23	483	1135	1006
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.4	27.2	8.4	12.1
Approach LOS	A	D	A	B

Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	LT	R	LT	R	L	TR
Assumed Moves	LTR	LT	R	LT	R	L	TR
RT Channelized							
Lane Util	1.000	0.678	0.322	0.679	0.321	0.227	0.773
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.544	4.544	4.544	4.544	4.645	4.328
Entry Flow, veh/h	71	666	317	678	320	135	460
Cap Entry Lane, veh/h	491	750	750	1199	1199	723	798
Entry HV Adj Factor	0.992	0.971	0.981	0.981	0.981	0.978	0.981
Flow Entry, veh/h	70	647	311	665	314	132	451
Cap Entry, veh/h	487	729	736	1176	1176	707	782
V/C Ratio	0.145	0.888	0.422	0.565	0.267	0.187	0.576
Control Delay, s/veh	9.4	35.2	10.5	9.8	5.5	7.2	13.6
LOS	A	E	B	A	A	A	B
95th %tile Queue, veh	1	11	2	4	1	1	4

The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2027 No Build
Timing Plan: AM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	384	330	483	187	194	670
Future Volume (vph)	384	330	483	187	194	670
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275	0		0	250	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr t		0.850	0.962			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1787	0	1736	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1787	0	1736	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	45		45			45
Link Distance (ft)	1073		667			652
Travel Time (s)	16.3		10.1			9.9
Peak Hour Factor	0.82	0.90	0.75	0.75	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	4%	2%
Adj. Flow (vph)	468	367	644	249	216	744
Shared Lane Traffic (%)						
Lane Group Flow (vph)	468	367	893	0	216	744
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Prot	NA		Prot	NA
Protected Phases	4	4	2		1	6

The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2027 No Build
Timing Plan: AM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases						
Detector Phase	4	4	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	14.0	14.0	19.0		14.0	19.0
Total Split (s)	27.0	27.0	47.0		16.0	63.0
Total Split (%)	30.0%	30.0%	52.2%		17.8%	70.0%
Maximum Green (s)	20.0	20.0	40.0		9.0	56.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	22.0	22.0	42.0		11.0	58.0
Actuated g/C Ratio	0.24	0.24	0.47		0.12	0.64
v/c Ratio	1.08	0.95	1.07		1.02	0.62
Control Delay	102.0	70.5	77.9		108.5	12.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	102.0	70.5	77.9		108.5	12.3
LOS	F	E	E		F	B
Approach Delay	88.2		77.9			33.9
Approach LOS	F		E			C

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Natural Cycle: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 65.4
 Intersection Capacity Utilization 81.3%
 Analysis Period (min) 15

Intersection LOS: E
ICU Level of Service D

Splits and Phases: 2: Matthews Weddington Rd & Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2027 No Build
Timing Plan: AM Peak

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	468	367	893	216	744
v/c Ratio	1.08	0.95	1.07	1.02	0.62
Control Delay	102.0	70.5	77.9	108.5	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	102.0	70.5	77.9	108.5	12.3
Queue Length 50th (ft)	~301	206	~569	~128	223
Queue Length 95th (ft)	#420	#377	#581	#270	332
Internal Link Dist (ft)	993		587		572
Turn Bay Length (ft)	275			250	
Base Capacity (vph)	432	386	833	212	1200
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.08	0.95	1.07	1.02	0.62

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave & Matthews Weddington Rd

2027 No Build
Timing Plan: AM Peak

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	667	4	0	1053	0	5
Future Volume (vph)	667	4	0	1053	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999					0.865
Flt Protected						
Satd. Flow (prot)	1861	0	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1861	0	0	1863	0	1611
Link Speed (mph)	45			45	35	
Link Distance (ft)	2073			667	1113	
Travel Time (s)	31.4			10.1	21.7	
Peak Hour Factor	0.83	0.90	0.90	0.89	0.90	0.90
Adj. Flow (vph)	804	4	0	1183	0	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	808	0	0	1183	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	4			4	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 58.8%

ICU Level of Service B

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave & Matthews Weddington Rd

2027 No Build
Timing Plan: AM Peak

Intersection

Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑		↗
Traffic Vol, veh/h	667	4	0	1053	0	5
Future Vol, veh/h	667	4	0	1053	0	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	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	90	90	89	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	804	4	0	1183	0	6

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - - 806
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - - 3.318
Pot Cap-1 Maneuver	-	-	0 - 0 382
Stage 1	-	-	0 - 0
Stage 2	-	-	0 - 0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - - 382
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	382	-	-	-
HCM Lane V/C Ratio	0.015	-	-	-
HCM Control Delay (s)	14.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

The Cottage Green

4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 No Build

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	190	54	290	602	164	353	106	311	134	62	106
Future Volume (vph)	76	190	54	290	602	164	353	106	311	134	62	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.957				0.850			0.850
Flt Protected		0.981		0.950				0.967			0.967	
Satd. Flow (prot)	0	1806	1553	1770	1783	0	0	1796	1583	0	1801	1583
Flt Permitted		0.981		0.950				0.967			0.967	
Satd. Flow (perm)	0	1806	1553	1770	1783	0	0	1796	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.57	0.90	0.90	0.90	0.90	0.62	0.90	0.61	0.90	0.50	0.52	0.55
Heavy Vehicles (%)	2%	4%	4%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	133	211	60	322	669	265	392	174	346	268	119	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	344	60	322	934	0	0	566	346	0	387	193
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 97.6%

ICU Level of Service F

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 No Build
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh 60.7
Intersection LOS F

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	404		1256		912		580	
Demand Flow Rate, veh/h	417		1280		932		591	
Vehicles Circulating, veh/h	722		715		628		1410	
Vehicles Exiting, veh/h	1279		845		511		585	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	11.2		103.3		15.8		73.3	
Approach LOS	B		F		C		F	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.851	0.149	0.256	0.744	0.621	0.379	0.667	0.333
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	355	62	328	952	579	353	394	197
Cap Entry Lane, veh/h	736	736	699	773	802	802	369	428
Entry HV Adj Factor	0.968	0.968	0.982	0.981	0.977	0.980	0.981	0.980
Flow Entry, veh/h	344	60	322	934	566	346	387	193
Cap Entry, veh/h	712	712	686	758	784	786	362	420
V/C Ratio	0.482	0.084	0.469	1.231	0.722	0.440	1.068	0.460
Control Delay, s/veh	12.1	5.9	12.1	134.8	19.2	10.3	101.0	18.0
LOS	B	A	B	F	C	B	F	C
95th %tile Queue, veh	3	0	3	33	6	2	14	2

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	3086	3181	3113	3006	3213	3096	3186
Vehs Exited	2836	2911	2836	2850	2984	2878	2965
Starting Vehs	146	145	172	193	154	142	165
Ending Vehs	396	415	449	349	383	360	386
Travel Distance (mi)	2387	2442	2361	2349	2420	2385	2435
Travel Time (hr)	473.8	381.0	511.6	460.2	265.2	418.6	379.9
Total Delay (hr)	409.9	315.6	448.6	397.3	200.0	354.8	314.4
Total Stops	4778	5348	5113	5093	5565	4907	5414
Fuel Used (gal)	176.9	157.0	182.9	171.3	131.3	164.5	156.8

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3115	3142	3114	3125
Vehs Exited	2884	2918	2877	2893
Starting Vehs	172	164	171	161
Ending Vehs	403	388	408	393
Travel Distance (mi)	2375	2410	2397	2396
Travel Time (hr)	473.4	482.8	441.7	428.8
Total Delay (hr)	409.6	418.2	377.4	364.6
Total Stops	4738	4884	4776	5059
Fuel Used (gal)	175.7	179.6	169.8	166.6

Interval #0 Information Seeding

Start Time 6:57
End Time 7:07
Total Time (min) 10
Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time 7:07
End Time 8:07
Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	3086	3181	3113	3006	3213	3096	3186
Vehs Exited	2836	2911	2836	2850	2984	2878	2965
Starting Vehs	146	145	172	193	154	142	165
Ending Vehs	396	415	449	349	383	360	386
Travel Distance (mi)	2387	2442	2361	2349	2420	2385	2435
Travel Time (hr)	473.8	381.0	511.6	460.2	265.2	418.6	379.9
Total Delay (hr)	409.9	315.6	448.6	397.3	200.0	354.8	314.4
Total Stops	4778	5348	5113	5093	5565	4907	5414
Fuel Used (gal)	176.9	157.0	182.9	171.3	131.3	164.5	156.8

Interval #1 Information Recording

Start Time 7:07
End Time 8:07
Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	3115	3142	3114	3125
Vehs Exited	2884	2918	2877	2893
Starting Vehs	172	164	171	161
Ending Vehs	403	388	408	393
Travel Distance (mi)	2375	2410	2397	2396
Travel Time (hr)	473.4	482.8	441.7	428.8
Total Delay (hr)	409.6	418.2	377.4	364.6
Total Stops	4738	4884	4776	5059
Fuel Used (gal)	175.7	179.6	169.8	166.6

Intersection: 1: Matthews Weddington Rd & Chestnut Ln

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	LT	R	L	TR
Maximum Queue (ft)	684	1245	250	173	61	350	1003
Average Queue (ft)	236	922	231	57	5	156	521
95th Queue (ft)	682	1605	334	128	37	408	1236
Link Distance (ft)	1116	1276		304			965
Upstream Blk Time (%)	1	42					40
Queuing Penalty (veh)	0	0					0
Storage Bay Dist (ft)			150		150	250	
Storage Blk Time (%)		93		1		2	52
Queuing Penalty (veh)		259		2		7	62

Intersection: 2: Matthews Weddington Rd & Antioch Ch Rd

Movement	WB	WB	NB	SB	SB	B5
Directions Served	L	R	TR	L	T	T
Maximum Queue (ft)	375	1084	544	350	700	384
Average Queue (ft)	355	870	317	293	529	226
95th Queue (ft)	443	1387	519	446	885	504
Link Distance (ft)		1035	604		592	304
Upstream Blk Time (%)		65	1		58	54
Queuing Penalty (veh)		0	6		496	465
Storage Bay Dist (ft)	275			250		
Storage Blk Time (%)	80	8		3	70	
Queuing Penalty (veh)	264	30		22	135	

Intersection: 3: Brayland Ave & Matthews Weddington Rd

Movement	EB	WB	NB
Directions Served	TR	T	R
Maximum Queue (ft)	54	612	26
Average Queue (ft)	3	498	3
95th Queue (ft)	47	860	17
Link Distance (ft)	1878	604	1080
Upstream Blk Time (%)		7	
Queuing Penalty (veh)		78	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	101	32	250	1986	474	250	154	68
Average Queue (ft)	42	2	249	1853	142	48	70	16
95th Queue (ft)	82	19	256	2362	322	177	126	55
Link Distance (ft)	1170			1878	865		670	
Upstream Blk Time (%)				84				
Queuing Penalty (veh)				886				
Storage Bay Dist (ft)		150	150			150		75
Storage Blk Time (%)	0		8	99	15		14	0
Queuing Penalty (veh)	0		65	286	47		14	0

Network Summary

Network wide Queuing Penalty: 3125

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 No Build
Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	6	7	226	15	122	28	353	394	237	520	17
Future Volume (vph)	9	6	7	226	15	122	28	353	394	237	520	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957				0.850			0.850		0.995	
Flt Protected		0.980			0.955			0.996		0.950		
Satd. Flow (prot)	0	1747	0	0	1779	1583	0	1855	1583	1770	1853	0
Flt Permitted		0.980			0.955			0.996		0.950		
Satd. Flow (perm)	0	1747	0	0	1779	1583	0	1855	1583	1770	1853	0
Link Speed (mph)		25			45			45		45		
Link Distance (ft)		1281			1441			496		1129		
Travel Time (s)		34.9			21.8			7.5		17.1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	7	8	251	17	136	31	392	438	263	578	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	0	0	268	136	0	423	438	263	597	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22		22		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 78.5%

ICU Level of Service D

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 No Build
Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh	7.9						
Intersection LOS	A						
Approach	EB	WB		NB		SB	
Entry Lanes	1	2		2		2	
Conflicting Circle Lanes	2	1		1		2	
Adj Approach Flow, veh/h	25	404		861		860	
Demand Flow Rate, veh/h	25	412		879		877	
Vehicles Circulating, veh/h	1114	442		285		305	
Vehicles Exiting, veh/h	68	722		854		549	
Ped Vol Crossing Leg, #/h	0	0		0		0	
Ped Cap Adj	1.000	1.000		1.000		1.000	
Approach Delay, s/veh	7.1	6.3		7.6		9.0	
Approach LOS	A	A		A		A	
Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	LT	R	LT	R	L	TR
Assumed Moves	LTR	LT	R	LT	R	L	TR
RT Channelized							
Lane Util	1.000	0.663	0.337	0.491	0.509	0.306	0.694
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.544	4.544	4.544	4.544	4.645	4.328
Entry Flow, veh/h	25	273	139	432	447	268	609
Cap Entry Lane, veh/h	551	950	950	1096	1096	1020	1096
Entry HV Adj Factor	0.995	0.980	0.978	0.980	0.980	0.981	0.981
Flow Entry, veh/h	25	268	136	423	438	263	597
Cap Entry, veh/h	548	931	929	1073	1074	1001	1075
V/C Ratio	0.045	0.287	0.146	0.394	0.408	0.263	0.556
Control Delay, s/veh	7.1	6.9	5.3	7.5	7.7	6.2	10.2
LOS	A	A	A	A	A	A	B
95th %tile Queue, veh	0	1	1	2	2	1	4

The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2027 No Build
Timing Plan: PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	165	211	557	313	315	429
Future Volume (vph)	165	211	557	313	315	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275	0		0	250	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr t		0.850	0.951			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1771	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1771	0	1770	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	45		45			45
Link Distance (ft)	1073		667			652
Travel Time (s)	16.3		10.1			9.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	183	234	619	348	350	477
Shared Lane Traffic (%)						
Lane Group Flow (vph)	183	234	967	0	350	477
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	20	6		20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Prot	NA		Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases						

The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2027 No Build
Timing Plan: PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	14.0	14.0	19.0		14.0	19.0
Total Split (s)	18.0	18.0	50.0		22.0	72.0
Total Split (%)	20.0%	20.0%	55.6%		24.4%	80.0%
Maximum Green (s)	11.0	11.0	43.0		15.0	65.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	13.0	13.0	45.0		17.0	67.0
Actuated g/C Ratio	0.14	0.14	0.50		0.19	0.74
v/c Ratio	0.72	1.03	1.09		1.05	0.34
Control Delay	54.0	107.1	83.0		100.0	4.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	54.0	107.1	83.0		100.0	4.7
LOS	D	F	F		F	A
Approach Delay	83.8		83.0			45.0
Approach LOS	F		F			D

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 68.9

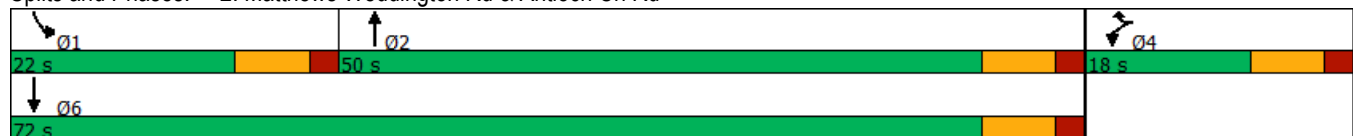
Intersection Capacity Utilization 87.5%

Analysis Period (min) 15

Intersection LOS: E

ICU Level of Service E

Splits and Phases: 2: Matthews Weddington Rd & Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Antioch Ch Rd

2027 No Build
Timing Plan: PM Peak

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	183	234	967	350	477
v/c Ratio	0.72	1.03	1.09	1.05	0.34
Control Delay	54.0	107.1	83.0	100.0	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	107.1	83.0	100.0	4.7
Queue Length 50th (ft)	101	~139	~627	~219	76
Queue Length 95th (ft)	#196	#286	#860	#387	114
Internal Link Dist (ft)	993		587		572
Turn Bay Length (ft)	275			250	
Base Capacity (vph)	255	228	885	334	1386
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	1.03	1.09	1.05	0.34

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave & Matthews Weddington Rd

2027 No Build
Timing Plan: PM Peak

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	819	10	0	658	0	4
Future Volume (vph)	819	10	0	658	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					0.865
Flt Protected						
Satd. Flow (prot)	1859	0	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1859	0	0	1863	0	1611
Link Speed (mph)	45			45	35	
Link Distance (ft)	2073			667	1113	
Travel Time (s)	31.4			10.1	21.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	910	11	0	731	0	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	921	0	0	731	0	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	4			4	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 53.7%

ICU Level of Service A

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave & Matthews Weddington Rd

2027 No Build
Timing Plan: PM Peak

Intersection

Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑		↗
Traffic Vol, veh/h	819	10	0	658	0	4
Future Vol, veh/h	819	10	0	658	0	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	-	-	-	-	-	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	910	11	0	731	0	4

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - - 916
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - - 3.318
Pot Cap-1 Maneuver	-	-	0 - 0 330
Stage 1	-	-	0 - 0 -
Stage 2	-	-	0 - 0 -
Platoon blocked, %	-	-	- - -
Mov Cap-1 Maneuver	-	-	- - - 330
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	330	-	-	-
HCM Lane V/C Ratio	0.013	-	-	-
HCM Control Delay (s)	16.1	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 No Build
Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	498	174	237	305	144	66	49	208	151	66	69
Future Volume (vph)	73	498	174	237	305	144	66	49	208	151	66	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.947				0.850			0.850
Flt Protected		0.992		0.950				0.978			0.967	
Satd. Flow (prot)	0	1848	1583	1770	1764	0	0	1814	1583	0	1801	1583
Flt Permitted		0.992		0.950				0.978			0.967	
Satd. Flow (perm)	0	1848	1583	1770	1764	0	0	1814	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.65	0.90	0.90	0.90	0.90	0.78	0.90	0.53	0.90	0.59	0.53	0.61
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Adj. Flow (vph)	112	553	193	263	339	185	73	92	231	256	125	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	665	193	263	524	0	0	165	231	0	381	113
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 83.6%

ICU Level of Service E

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 No Build
Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh 15.3
Intersection LOS C

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	858		787		396		494	
Demand Flow Rate, veh/h	875		803		405		504	
Vehicles Circulating, veh/h	656		283		939		689	
Vehicles Exiting, veh/h	536		1061		592		397	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	26.0		7.8		11.0		12.0	
Approach LOS	D		A		B		B	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.775	0.225	0.334	0.666	0.417	0.583	0.772	0.228
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	678	197	268	535	169	236	389	115
Cap Entry Lane, veh/h	782	782	1040	1116	604	604	716	791
Entry HV Adj Factor	0.981	0.980	0.981	0.980	0.977	0.979	0.981	0.983
Flow Entry, veh/h	665	193	263	524	165	231	381	113
Cap Entry, veh/h	767	766	1021	1094	590	591	702	777
V/C Ratio	0.867	0.252	0.258	0.479	0.280	0.391	0.543	0.145
Control Delay, s/veh	31.4	7.5	6.0	8.7	9.8	11.9	13.8	6.1
LOS	D	A	A	A	A	B	B	A
95th %tile Queue, veh	11	1	1	3	1	2	3	1

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	2979	3019	3066	2947	2887	3000	3034
Vehs Exited	2941	2950	2890	2935	2744	2884	2883
Starting Vehs	140	118	105	137	96	111	103
Ending Vehs	178	187	281	149	239	227	254
Travel Distance (mi)	2436	2438	2401	2389	2277	2372	2386
Travel Time (hr)	204.2	168.7	227.5	165.6	186.7	198.2	216.6
Total Delay (hr)	139.1	103.4	163.2	101.6	125.6	134.6	152.6
Total Stops	5057	4445	5251	4322	4553	4531	5252
Fuel Used (gal)	120.7	113.7	123.5	111.5	111.3	116.8	121.0

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3025	3017	3044	3005
Vehs Exited	2921	2896	2941	2899
Starting Vehs	109	116	113	112
Ending Vehs	213	237	216	217
Travel Distance (mi)	2430	2388	2425	2394
Travel Time (hr)	173.1	206.3	213.6	196.1
Total Delay (hr)	107.9	142.2	148.8	131.9
Total Stops	4458	4761	5388	4802
Fuel Used (gal)	114.2	119.7	121.9	117.4

Interval #0 Information Seeding

Start Time 6:57
End Time 7:07
Total Time (min) 10
Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time 7:07
End Time 8:07
Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	2979	3019	3066	2947	2887	3000	3034
Vehs Exited	2941	2950	2890	2935	2744	2884	2883
Starting Vehs	140	118	105	137	96	111	103
Ending Vehs	178	187	281	149	239	227	254
Travel Distance (mi)	2436	2438	2401	2389	2277	2372	2386
Travel Time (hr)	204.2	168.7	227.5	165.6	186.7	198.2	216.6
Total Delay (hr)	139.1	103.4	163.2	101.6	125.6	134.6	152.6
Total Stops	5057	4445	5251	4322	4553	4531	5252
Fuel Used (gal)	120.7	113.7	123.5	111.5	111.3	116.8	121.0

Interval #1 Information Recording

Start Time 7:07
End Time 8:07
Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	3025	3017	3044	3005
Vehs Exited	2921	2896	2941	2899
Starting Vehs	109	116	113	112
Ending Vehs	213	237	216	217
Travel Distance (mi)	2430	2388	2425	2394
Travel Time (hr)	173.1	206.3	213.6	196.1
Total Delay (hr)	107.9	142.2	148.8	131.9
Total Stops	4458	4761	5388	4802
Fuel Used (gal)	114.2	119.7	121.9	117.4

The Cottage Green
Queuing and Blocking Report

2027 No Build
PM Peak

Intersection: 1: Matthews Weddington Rd & Chestnut Ln

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	LT	R	L	TR
Maximum Queue (ft)	55	105	45	121	57	321	619
Average Queue (ft)	12	42	6	52	16	134	267
95th Queue (ft)	41	79	30	100	50	336	670
Link Distance (ft)	1116	1276		304			965
Upstream Blk Time (%)							5
Queuing Penalty (veh)							0
Storage Bay Dist (ft)			150		150	250	
Storage Blk Time (%)		0		0		1	27
Queuing Penalty (veh)		0		0		4	63

Intersection: 2: Matthews Weddington Rd & Antioch Ch Rd

Movement	WB	WB	NB	SB	SB	B5
Directions Served	L	R	TR	L	T	T
Maximum Queue (ft)	295	552	695	350	650	281
Average Queue (ft)	144	282	648	307	431	121
95th Queue (ft)	314	651	722	414	834	377
Link Distance (ft)		1035	604		592	304
Upstream Blk Time (%)		2	54		25	13
Queuing Penalty (veh)		0	445		192	100
Storage Bay Dist (ft)	275			250		
Storage Blk Time (%)	0	21		58	2	
Queuing Penalty (veh)	0	35		249	7	

Intersection: 3: Brayland Ave & Matthews Weddington Rd

Movement	EB	NB
Directions Served	TR	R
Maximum Queue (ft)	1250	96
Average Queue (ft)	650	37
95th Queue (ft)	1482	104
Link Distance (ft)	1878	1080
Upstream Blk Time (%)	3	
Queuing Penalty (veh)	26	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	854	250	156	200	100	75	143	44
Average Queue (ft)	394	151	48	60	32	21	57	4
95th Queue (ft)	837	348	106	142	84	74	109	23
Link Distance (ft)	1170			1878	865		670	
Upstream Blk Time (%)	1							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)		150	150			150		75
Storage Blk Time (%)	64		0	1	1	0	6	
Queuing Penalty (veh)	112		1	3	2	0	4	

Network Summary

Network wide Queuing Penalty: 1242

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	24	15	540	6	280	9	584	294	119	370	4
Future Volume (vph)	21	24	15	540	6	280	9	584	294	119	370	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961				0.850			0.850		0.999	
Flt Protected		0.984			0.953			0.999		0.950		
Satd. Flow (prot)	0	1761	0	0	1758	1583	0	1861	1583	1770	1861	0
Flt Permitted		0.984			0.953			0.999		0.950		
Satd. Flow (perm)	0	1761	0	0	1758	1583	0	1861	1583	1770	1861	0
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1281			1441			496			1129	
Travel Time (s)		34.9			21.8			7.5			17.1	
Peak Hour Factor	0.90	0.90	0.75	0.80	0.90	0.90	0.75	0.83	0.83	0.90	0.75	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	23	27	20	675	7	311	12	704	354	132	493	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	682	311	0	716	354	132	497	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 97.8%

ICU Level of Service F

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh	21.7						
Intersection LOS	C						
Approach	EB	WB		NB		SB	
Entry Lanes	1	2		2		2	
Conflicting Circle Lanes	2	1		1		2	
Adj Approach Flow, veh/h	70	993		1070		629	
Demand Flow Rate, veh/h	71	1019		1091		642	
Vehicles Circulating, veh/h	1333	753		186		714	
Vehicles Exiting, veh/h	23	524		1218		1058	
Ped Vol Crossing Leg, #/h	0	0		0		0	
Ped Cap Adj	1.000	1.000		1.000		1.000	
Approach Delay, s/veh	10.2	40.5		9.1		14.7	
Approach LOS	B	E		A		B	
Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	LT	R	LT	R	L	TR
Assumed Moves	LTR	LT	R	LT	R	L	TR
RT Channelized							
Lane Util	1.000	0.689	0.311	0.669	0.331	0.210	0.790
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.544	4.544	4.544	4.544	4.645	4.328
Entry Flow, veh/h	71	702	317	730	361	135	507
Cap Entry Lane, veh/h	457	716	716	1199	1199	700	774
Entry HV Adj Factor	0.992	0.971	0.981	0.981	0.981	0.978	0.981
Flow Entry, veh/h	70	682	311	716	354	132	497
Cap Entry, veh/h	454	695	702	1176	1176	684	759
V/C Ratio	0.155	0.981	0.443	0.609	0.301	0.193	0.655
Control Delay, s/veh	10.2	53.8	11.4	10.7	5.9	7.5	16.6
LOS	B	F	B	B	A	A	C
95th %tile Queue, veh	1	15	2	4	1	1	5

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	25	25	384	27	330	48	483	187	202	694	21
Future Volume (vph)	75	25	25	384	27	330	48	483	187	202	694	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		125	275		0	150		0	250		175
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.861			0.958				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1604	0	1770	1780	0	1736	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1604	0	1770	1780	0	1736	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1061			1073			667			652	
Travel Time (s)		28.9			16.3			10.1			9.9	
Peak Hour Factor	0.90	0.90	0.90	0.82	0.90	0.90	0.90	0.75	0.75	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	3%	4%	2%	2%
Adj. Flow (vph)	83	28	28	468	30	367	53	644	249	224	771	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	28	28	468	397	0	53	893	0	224	771	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			16			20	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4									6
Detector Phase	7	4	5	3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	20.0		14.0	19.0		14.0	19.0	14.0
Total Split (s)	14.0	14.0	14.0	40.0	40.0		14.0	74.0		22.0	82.0	14.0
Total Split (%)	9.3%	9.3%	9.3%	26.7%	26.7%		9.3%	49.3%		14.7%	54.7%	9.3%
Maximum Green (s)	7.0	7.0	7.0	33.0	33.0		7.0	67.0		15.0	75.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-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		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Max		None	Max	None
Act Effct Green (s)	9.0	9.0	17.4	40.6	35.0		9.0	69.0		17.0	79.8	93.8
Actuated g/C Ratio	0.06	0.06	0.12	0.27	0.23		0.06	0.46		0.11	0.53	0.63
v/c Ratio	0.78	0.25	0.15	0.98	1.06		0.50	1.09		1.14	0.78	0.02
Control Delay	111.6	73.2	58.3	89.1	117.4		84.9	97.8		164.7	35.8	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	111.6	73.2	58.3	89.1	117.4		84.9	97.8		164.7	35.8	11.9
LOS	F	E	E	F	F		F	F		F	D	B
Approach Delay		93.1			102.1			97.1			63.6	
Approach LOS		F			F			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 86.9

Intersection LOS: F

Intersection Capacity Utilization 92.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build
Timing Plan: AM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	83	28	28	468	397	53	893	224	771	23
v/c Ratio	0.78	0.25	0.15	0.98	1.06	0.50	1.09	1.14	0.78	0.02
Control Delay	111.6	73.2	58.3	89.1	117.4	84.9	97.8	164.7	35.8	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.6	73.2	58.3	89.1	117.4	84.9	97.8	164.7	35.8	11.9
Queue Length 50th (ft)	82	27	24	~530	~426	51	~981	~255	612	9
Queue Length 95th (ft)	#176	62	56	#648	#639	100	#896	#431	804	21
Internal Link Dist (ft)		981			993		587		572	
Turn Bay Length (ft)	125		125	275		150		250		175
Base Capacity (vph)	106	111	183	479	374	106	818	196	991	990
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.25	0.15	0.98	1.06	0.50	1.09	1.14	0.78	0.02

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	715	4	0	1095	7	0	0	5	0	0	17
Future Volume (vph)	0	715	4	0	1095	7	0	0	5	0	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.999				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	1861	0	0	1861	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	1861	0	0	1861	0	0	0	1611	0	0	1611
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		2073			667			1113			967	
Travel Time (s)		31.4			10.1			21.7			26.4	
Peak Hour Factor	0.90	0.83	0.90	0.90	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	861	4	0	1230	8	0	0	6	0	0	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	865	0	0	1238	0	0	0	6	0	0	19
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		4			4			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 68.1%

ICU Level of Service C

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build
Timing Plan: AM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱				↱			↱
Traffic Vol, veh/h	0	715	4	0	1095	7	0	0	5	0	0	17
Future Vol, veh/h	0	715	4	0	1095	7	0	0	5	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	83	90	90	89	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	861	4	0	1230	8	0	0	6	0	0	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	863	-	-	1234
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	354	0	0	215
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	354	-	-	215
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	15.3	23.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	354	-	-	-	-	215
HCM Lane V/C Ratio	0.016	-	-	-	-	0.088
HCM Control Delay (s)	15.3	-	-	-	-	23.4
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3

The Cottage Green

2027 Build

4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	217	54	315	636	164	353	106	332	134	62	106
Future Volume (vph)	76	217	54	315	636	164	353	106	332	134	62	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.959				0.850			0.850
Flt Protected		0.983		0.950				0.967			0.967	
Satd. Flow (prot)	0	1808	1553	1770	1786	0	0	1796	1583	0	1801	1583
Flt Permitted		0.983		0.950				0.967			0.967	
Satd. Flow (perm)	0	1808	1553	1770	1786	0	0	1796	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.57	0.90	0.90	0.90	0.90	0.62	0.90	0.61	0.90	0.50	0.52	0.55
Heavy Vehicles (%)	2%	4%	4%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	133	241	60	350	707	265	392	174	369	268	119	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	374	60	350	972	0	0	566	369	0	387	193
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 100.9%

ICU Level of Service G

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh 70.2
Intersection LOS F

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	434		1322		935		580	
Demand Flow Rate, veh/h	449		1348		955		591	
Vehicles Circulating, veh/h	751		715		660		1478	
Vehicles Exiting, veh/h	1318		900		540		585	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	12.7		117.6		17.1		90.7	
Approach LOS	B		F		C		F	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.862	0.138	0.265	0.735	0.606	0.394	0.667	0.333
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	387	62	357	991	579	376	394	197
Cap Entry Lane, veh/h	717	717	699	773	779	779	347	404
Entry HV Adj Factor	0.967	0.968	0.980	0.981	0.977	0.981	0.981	0.980
Flow Entry, veh/h	374	60	350	972	566	369	387	193
Cap Entry, veh/h	693	694	686	758	761	764	340	396
V/C Ratio	0.540	0.086	0.511	1.282	0.743	0.483	1.137	0.487
Control Delay, s/veh	13.8	6.1	13.2	155.3	20.8	11.4	126.1	19.9
LOS	B	A	B	F	C	B	F	C
95th %tile Queue, veh	3	0	3	37	7	3	15	3

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build
Timing Plan: AM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	25	0	888	892	35
Future Volume (vph)	0	25	0	888	892	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.995	
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1853	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1853	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	1290			652	496	
Travel Time (s)	35.2			9.9	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	28	0	987	991	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	28	0	987	1030	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 59.1%

ICU Level of Service B

Analysis Period (min) 15

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build
Timing Plan: AM Peak

Intersection

Int Delay, s/veh 0.3

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	25	0	888	892	35
Future Vol, veh/h	0	25	0	888	892	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	28	0	987	991	39

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	-	1011	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	291	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	291	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	18.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt NBT EBLn1 SBT SBR

Capacity (veh/h)	-	291	-	-
HCM Lane V/C Ratio	-	0.095	-	-
HCM Control Delay (s)	-	18.7	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.3	-	-

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build
Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	6	7	268	15	122	28	395	427	237	572	17
Future Volume (vph)	9	6	7	268	15	122	28	395	427	237	572	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	0		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957				0.850			0.850		0.996	
Flt Protected		0.980			0.955			0.997		0.950		
Satd. Flow (prot)	0	1747	0	0	1779	1583	0	1857	1583	1770	1855	0
Flt Permitted		0.980			0.955			0.997		0.950		
Satd. Flow (perm)	0	1747	0	0	1779	1583	0	1857	1583	1770	1855	0
Link Speed (mph)		25			45			45		45		
Link Distance (ft)		1281			1441			496		1129		
Travel Time (s)		34.9			21.8			7.5		17.1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	7	8	298	17	136	31	439	474	263	636	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	0	0	315	136	0	470	474	263	655	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22		22		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 85.8%

ICU Level of Service E

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build
Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh	9.0						
Intersection LOS	A						
Approach	EB	WB		NB		SB	
Entry Lanes	1	2		2		2	
Conflicting Circle Lanes	2	1		1		2	
Adj Approach Flow, veh/h	25	451		944		918	
Demand Flow Rate, veh/h	25	460		963		936	
Vehicles Circulating, veh/h	1221	490		285		353	
Vehicles Exiting, veh/h	68	758		961		597	
Ped Vol Crossing Leg, #/h	0	0		0		0	
Ped Cap Adj	1.000	1.000		1.000		1.000	
Approach Delay, s/veh	7.8	7.3		8.1		10.8	
Approach LOS	A	A		A		B	
Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	LT	R	LT	R	L	TR
Assumed Moves	LTR	LT	R	LT	R	L	TR
RT Channelized							
Lane Util	1.000	0.698	0.302	0.498	0.502	0.286	0.714
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.544	4.544	4.544	4.544	4.645	4.328
Entry Flow, veh/h	25	321	139	480	483	268	668
Cap Entry Lane, veh/h	503	909	909	1096	1096	976	1052
Entry HV Adj Factor	0.995	0.980	0.978	0.980	0.981	0.981	0.981
Flow Entry, veh/h	25	315	136	470	474	263	655
Cap Entry, veh/h	500	891	890	1073	1075	957	1032
V/C Ratio	0.050	0.353	0.153	0.438	0.441	0.275	0.635
Control Delay, s/veh	7.8	8.0	5.5	8.1	8.2	6.6	12.5
LOS	A	A	A	A	A	A	B
95th %tile Queue, veh	0	2	1	2	2	1	5

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build
Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	27	32	161	50	207	80	551	312	322	453	36
Future Volume (vph)	85	27	32	161	50	207	80	551	312	322	453	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		125	275		0	150		0	250		175
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.879			0.946				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1637	0	1770	1762	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1637	0	1770	1762	0	1770	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1114			1073			667			652	
Travel Time (s)		30.4			16.3			10.1			9.9	
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)	94	30	36	179	56	230	89	612	347	358	503	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	30	36	179	286	0	89	959	0	358	503	40
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			16			20	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build
Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	20.0		14.0	19.0		14.0	19.0	14.0
Total Split (s)	14.0	16.0	20.0	25.0	27.0		20.0	78.0		31.0	89.0	14.0
Total Split (%)	9.3%	10.7%	13.3%	16.7%	18.0%		13.3%	52.0%		20.7%	59.3%	9.3%
Maximum Green (s)	7.0	9.0	13.0	18.0	20.0		13.0	71.0		24.0	82.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-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		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Max		None	Max	None
Act Effct Green (s)	9.0	10.2	23.1	26.4	22.0		13.5	73.0		26.0	85.5	99.5
Actuated g/C Ratio	0.06	0.07	0.15	0.18	0.15		0.09	0.49		0.17	0.57	0.66
v/c Ratio	0.89	0.24	0.15	0.58	1.19		0.56	1.12		1.17	0.47	0.04
Control Delay	129.2	70.6	52.0	66.7	172.5		78.8	105.2		158.1	21.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	129.2	70.6	52.0	66.7	172.5		78.8	105.2		158.1	21.2	9.3
LOS	F	E	D	E	F		E	F		F	C	A
Approach Delay		100.9			131.8			103.0			75.0	
Approach LOS		F			F			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 98.3

Intersection Capacity Utilization 103.7%

Analysis Period (min) 15

Intersection LOS: F

ICU Level of Service G

Splits and Phases: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build
Timing Plan: PM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	94	30	36	179	286	89	959	358	503	40
v/c Ratio	0.89	0.24	0.15	0.58	1.19	0.56	1.12	1.17	0.47	0.04
Control Delay	129.2	70.6	52.0	66.7	172.5	78.8	105.2	158.1	21.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	129.2	70.6	52.0	66.7	172.5	78.8	105.2	158.1	21.2	9.3
Queue Length 50th (ft)	93	28	29	171	~337	84	~1076	~415	286	13
Queue Length 95th (ft)	#207	64	63	#284	#527	146	#1337	#620	384	28
Internal Link Dist (ft)		1034			993		587		572	
Turn Bay Length (ft)	125		125	275		150		250		175
Base Capacity (vph)	106	136	259	311	240	177	857	306	1061	1050
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.22	0.14	0.58	1.19	0.50	1.12	1.17	0.47	0.04

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build
Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	892	10	0	698	13	0	0	4	0	0	18
Future Volume (vph)	0	892	10	0	698	13	0	0	4	0	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.998				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	1861	0	0	1859	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	1861	0	0	1859	0	0	0	1611	0	0	1611
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		2073			667			1113			1016	
Travel Time (s)		31.4			10.1			21.7			27.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	991	11	0	776	14	0	0	4	0	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1002	0	0	790	0	0	0	4	0	0	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		4			4			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.6%

ICU Level of Service B

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build
Timing Plan: PM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱				↱			↱
Traffic Vol, veh/h	0	892	10	0	698	13	0	0	4	0	0	18
Future Vol, veh/h	0	892	10	0	698	13	0	0	4	0	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
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	0	991	11	0	776	14	0	0	4	0	0	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	997	-	-	783
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	296	0	0	394
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	296	-	-	394
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	17.3	14.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	296	-	-	-	-	394
HCM Lane V/C Ratio	0.015	-	-	-	-	0.051
HCM Control Delay (s)	17.3	-	-	-	-	14.6
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2

The Cottage Green

2027 Build

4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	540	174	262	338	144	66	49	239	151	66	69
Future Volume (vph)	73	540	174	262	338	144	66	49	239	151	66	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.951				0.850			0.850
Flt Protected		0.992		0.950				0.978			0.967	
Satd. Flow (prot)	0	1848	1583	1770	1771	0	0	1814	1583	0	1801	1583
Flt Permitted		0.992		0.950				0.978			0.967	
Satd. Flow (perm)	0	1848	1583	1770	1771	0	0	1814	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.65	0.90	0.90	0.90	0.90	0.78	0.90	0.53	0.90	0.59	0.53	0.61
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Adj. Flow (vph)	112	600	193	291	376	185	73	92	266	256	125	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	712	193	291	561	0	0	165	266	0	381	113
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 87.5%

ICU Level of Service E

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build
Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh 19.9
Intersection LOS C

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	905		852		431		494	
Demand Flow Rate, veh/h	923		870		440		504	
Vehicles Circulating, veh/h	685		283		987		756	
Vehicles Exiting, veh/h	574		1144		621		397	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	37.7		8.3		12.7		13.5	
Approach LOS	E		A		B		B	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.787	0.213	0.341	0.659	0.384	0.616	0.772	0.228
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	726	197	297	573	169	271	389	115
Cap Entry Lane, veh/h	761	761	1040	1116	578	578	673	747
Entry HV Adj Factor	0.981	0.980	0.980	0.980	0.977	0.982	0.981	0.983
Flow Entry, veh/h	712	193	291	561	165	266	381	113
Cap Entry, veh/h	747	746	1019	1094	565	568	660	734
V/C Ratio	0.954	0.259	0.285	0.513	0.292	0.469	0.578	0.154
Control Delay, s/veh	45.8	7.8	6.4	9.3	10.4	14.2	15.5	6.6
LOS	E	A	A	A	B	B	C	A
95th %tile Queue, veh	14	1	1	3	1	2	4	1

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build
Timing Plan: PM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	28	0	843	783	55
Future Volume (vph)	0	28	0	843	783	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.991	
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1846	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1846	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	1341			652	496	
Travel Time (s)	36.6			9.9	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	31	0	937	870	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	31	0	937	931	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.5%

ICU Level of Service A

Analysis Period (min) 15

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build
Timing Plan: PM Peak

Intersection

Int Delay, s/veh 0.3

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	28	0	843	783	55
Future Vol, veh/h	0	28	0	843	783	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	0	937	870	61

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	-	901	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	337	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	337	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	16.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt NBT EBLn1 SBT SBR

Capacity (veh/h)	-	337	-	-
HCM Lane V/C Ratio	-	0.092	-	-
HCM Control Delay (s)	-	16.8	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.3	-	-

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build w/ Imp.
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	24	15	540	6	280	9	584	294	119	370	4
Future Volume (vph)	21	24	15	540	6	280	9	584	294	119	370	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	1		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.961			0.903				0.850		0.999	
Flt Protected		0.984		0.950	0.983			0.999			0.990	
Satd. Flow (prot)	0	1761	0	1665	1566	0	0	1861	1583	0	3500	0
Flt Permitted		0.984		0.950	0.983			0.999			0.990	
Satd. Flow (perm)	0	1761	0	1665	1566	0	0	1861	1583	0	3500	0
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1281			1441			496			1129	
Travel Time (s)		34.9			21.8			7.5			17.1	
Peak Hour Factor	0.90	0.90	0.75	0.80	0.90	0.90	0.75	0.83	0.83	0.90	0.75	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	23	27	20	675	7	311	12	704	354	132	493	4
Shared Lane Traffic (%)				24%								
Lane Group Flow (vph)	0	70	0	513	480	0	0	716	354	0	629	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 85.4%

ICU Level of Service E

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build w/ Imp.
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh 14.3
Intersection LOS B

Approach	EB	WB	NB	SB
Entry Lanes	1	2	2	2
Conflicting Circle Lanes	2	2	1	2
Adj Approach Flow, veh/h	70	993	1070	629
Demand Flow Rate, veh/h	71	1019	1091	642
Vehicles Circulating, veh/h	1333	753	186	714
Vehicles Exiting, veh/h	23	524	1218	1058
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.2	22.4	9.1	10.9
Approach LOS	B	C	A	B

Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	L	LTR	LT	R	LT	TR
Assumed Moves	LTR	L	LTR	LT	R	LT	TR
RT Channelized							
Lane Util	1.000	0.530	0.470	0.669	0.331	0.470	0.530
Follow-Up Headway, s	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	71	540	479	730	361	302	340
Cap Entry Lane, veh/h	457	675	749	1199	1199	700	774
Entry HV Adj Factor	0.992	0.974	0.974	0.981	0.981	0.979	0.981
Flow Entry, veh/h	70	526	467	716	354	296	333
Cap Entry, veh/h	454	658	729	1176	1176	685	759
V/C Ratio	0.155	0.800	0.640	0.609	0.301	0.431	0.439
Control Delay, s/veh	10.2	27.6	16.5	10.7	5.9	11.3	10.6
LOS	B	D	C	B	A	B	B
95th %tile Queue, veh	1	8	5	4	1	2	2

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	25	25	384	27	330	48	483	187	202	694	21
Future Volume (vph)	75	25	25	384	27	330	48	483	187	202	694	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		125	275		0	150		225	250		0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't			0.850		0.861				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1604	0	1770	1863	1568	1736	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1604	0	1770	1863	1568	1736	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1061			1073			667			652	
Travel Time (s)		28.9			16.3			10.1			9.9	
Peak Hour Factor	0.90	0.90	0.90	0.82	0.90	0.90	0.90	0.75	0.75	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	3%	4%	2%	2%
Adj. Flow (vph)	83	28	28	468	30	367	53	644	249	224	771	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	28	28	468	397	0	53	644	249	224	771	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			16			20	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2	3	1	6	7

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4						2			6
Detector Phase	7	4	5	3	8		5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	20.0		14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	14.0	14.0	14.0	32.0	32.0		14.0	45.0	32.0	29.0	60.0	14.0
Total Split (%)	11.7%	11.7%	11.7%	26.7%	26.7%		11.7%	37.5%	26.7%	24.2%	50.0%	11.7%
Maximum Green (s)	7.0	7.0	7.0	25.0	25.0		7.0	38.0	25.0	22.0	53.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-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	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Max	None	None	Max	None
Act Effct Green (s)	9.1	9.1	17.1	29.9	27.2		9.1	41.4	76.3	20.9	56.6	70.7
Actuated g/C Ratio	0.08	0.08	0.15	0.26	0.24		0.08	0.36	0.66	0.18	0.49	0.61
v/c Ratio	0.60	0.19	0.12	1.02	1.05		0.38	0.96	0.24	0.71	0.85	0.02
Control Delay	72.0	55.6	42.5	91.3	104.7		61.5	65.3	10.2	58.4	38.2	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	55.6	42.5	91.3	104.7		61.5	65.3	10.2	58.4	38.2	11.2
LOS	E	E	D	F	F		E	E	B	E	D	B
Approach Delay		62.8			97.4			50.6			42.0	
Approach LOS		E			F			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 115.4

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 61.9

Intersection Capacity Utilization 86.7%

Analysis Period (min) 15

Intersection LOS: E

ICU Level of Service E

Splits and Phases: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.
Timing Plan: AM Peak

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	28	28	468	397	53	644	249	224	771	23
v/c Ratio	0.60	0.19	0.12	1.02	1.05	0.38	0.96	0.24	0.71	0.85	0.02
Control Delay	72.0	55.6	42.5	91.3	104.7	61.5	65.3	10.2	58.4	38.2	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	55.6	42.5	91.3	104.7	61.5	65.3	10.2	58.4	38.2	11.2
Queue Length 50th (ft)	64	21	18	~433	~349	40	~498	83	163	539	7
Queue Length 95th (ft)	#133	52	45	#556	#546	83	#555	105	248	#793	19
Internal Link Dist (ft)		981			993		587			572	
Turn Bay Length (ft)	125		125	275		150		225	250		
Base Capacity (vph)	138	146	235	458	377	138	668	1037	364	912	969
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.19	0.12	1.02	1.05	0.38	0.96	0.24	0.62	0.85	0.02

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build w/ Imp.

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	715	4	0	1095	7	0	0	5	0	0	17
Future Volume (vph)	0	715	4	0	1095	7	0	0	5	0	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		0	0		0
Storage Lanes	0		0	0		1	0		1	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		0.999				0.850			0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	1861	0	0	1863	1583	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	1861	0	0	1863	1583	0	0	1611	0	0	1611
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		2073			667			1113			967	
Travel Time (s)		31.4			10.1			21.7			26.4	
Peak Hour Factor	0.90	0.83	0.90	0.90	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	861	4	0	1230	8	0	0	6	0	0	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	865	0	0	1230	8	0	0	6	0	0	19
Enter Blocked Intersection	No	2 veh	No	No	2 veh	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		4			4			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 67.6%

ICU Level of Service C

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build w/ Imp.
Timing Plan: AM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱	↱			↱			↱
Traffic Vol, veh/h	0	715	4	0	1095	7	0	0	5	0	0	17
Future Vol, veh/h	0	715	4	0	1095	7	0	0	5	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	100	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	83	90	90	89	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	861	4	0	1230	8	0	0	6	0	0	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	863	-	-	1230
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	354	0	0	217
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	354	-	-	217
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			15.3			23.2		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	354	-	-	-	-	217
HCM Lane V/C Ratio	0.016	-	-	-	-	0.087
HCM Control Delay (s)	15.3	-	-	-	-	23.2
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build w/ Imp.

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	217	54	315	636	164	353	106	332	134	62	106
Future Volume (vph)	76	217	54	315	636	164	353	106	332	134	62	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.959				0.850			0.850
Flt Protected		0.983		0.950				0.967			0.967	
Satd. Flow (prot)	0	1808	1553	1770	1786	0	0	1796	1583	0	1801	1583
Flt Permitted		0.983		0.950				0.967			0.967	
Satd. Flow (perm)	0	1808	1553	1770	1786	0	0	1796	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.57	0.90	0.90	0.90	0.90	0.62	0.90	0.61	0.90	0.50	0.52	0.55
Heavy Vehicles (%)	2%	4%	4%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	133	241	60	350	707	265	392	174	369	268	119	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	374	60	350	972	0	0	566	369	0	387	193
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 100.9%

ICU Level of Service G

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build w/ Imp.
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh 70.2
Intersection LOS F

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	434		1322		935		580	
Demand Flow Rate, veh/h	449		1348		955		591	
Vehicles Circulating, veh/h	751		715		660		1478	
Vehicles Exiting, veh/h	1318		900		540		585	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	12.7		117.6		17.1		90.7	
Approach LOS	B		F		C		F	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.862	0.138	0.265	0.735	0.606	0.394	0.667	0.333
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	387	62	357	991	579	376	394	197
Cap Entry Lane, veh/h	717	717	699	773	779	779	347	404
Entry HV Adj Factor	0.967	0.968	0.980	0.981	0.977	0.981	0.981	0.980
Flow Entry, veh/h	374	60	350	972	566	369	387	193
Cap Entry, veh/h	693	694	686	758	761	764	340	396
V/C Ratio	0.540	0.086	0.511	1.282	0.743	0.483	1.137	0.487
Control Delay, s/veh	13.8	6.1	13.2	155.3	20.8	11.4	126.1	19.9
LOS	B	A	B	F	C	B	F	C
95th %tile Queue, veh	3	0	3	37	7	3	15	3

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build w/ Imp.
Timing Plan: AM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					 	
Traffic Volume (vph)	0	25	0	888	892	35
Future Volume (vph)	0	25	0	888	892	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.865			0.994	
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	3518	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	3518	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	1290			652	496	
Travel Time (s)	35.2			9.9	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	28	0	987	991	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	28	0	987	1030	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 50.1%

ICU Level of Service A

Analysis Period (min) 15

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build w/ Imp.
Timing Plan: AM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	25	0	888	892	35
Future Vol, veh/h	0	25	0	888	892	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	28	0	987	991	39

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	515	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.93	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.319	-
Pot Cap-1 Maneuver	0	506	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	506	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	506	-	-
HCM Lane V/C Ratio	-	0.055	-	-
HCM Control Delay (s)	-	12.5	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	3281	3340	3184	3299	3285	3405	3295
Vehs Exited	3049	3059	2970	3037	3016	3150	3064
Starting Vehs	181	152	215	193	170	173	209
Ending Vehs	413	433	429	455	439	428	440
Travel Distance (mi)	2490	2497	2408	2471	2461	2584	2490
Travel Time (hr)	515.1	504.9	523.0	502.1	422.3	498.8	500.0
Total Delay (hr)	447.7	437.3	457.8	435.0	355.6	428.7	432.5
Total Stops	6748	6376	5863	5872	5856	6756	5929
Fuel Used (gal)	190.2	187.8	188.9	187.3	168.3	189.5	186.5

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3302	3361	3325	3308
Vehs Exited	3026	3109	3087	3056
Starting Vehs	160	177	184	179
Ending Vehs	436	429	422	431
Travel Distance (mi)	2461	2507	2488	2486
Travel Time (hr)	508.6	499.6	489.9	496.4
Total Delay (hr)	441.9	431.5	422.3	429.0
Total Stops	6221	6460	6309	6241
Fuel Used (gal)	187.0	187.2	184.2	185.7

Interval #0 Information Seeding

Start Time 6:57
End Time 7:07
Total Time (min) 10
Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time 7:07
End Time 8:07
Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	3281	3340	3184	3299	3285	3405	3295
Vehs Exited	3049	3059	2970	3037	3016	3150	3064
Starting Vehs	181	152	215	193	170	173	209
Ending Vehs	413	433	429	455	439	428	440
Travel Distance (mi)	2490	2497	2408	2471	2461	2584	2490
Travel Time (hr)	515.1	504.9	523.0	502.1	422.3	498.8	500.0
Total Delay (hr)	447.7	437.3	457.8	435.0	355.6	428.7	432.5
Total Stops	6748	6376	5863	5872	5856	6756	5929
Fuel Used (gal)	190.2	187.8	188.9	187.3	168.3	189.5	186.5

Interval #1 Information Recording

Start Time 7:07
End Time 8:07
Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	3302	3361	3325	3308
Vehs Exited	3026	3109	3087	3056
Starting Vehs	160	177	184	179
Ending Vehs	436	429	422	431
Travel Distance (mi)	2461	2507	2488	2486
Travel Time (hr)	508.6	499.6	489.9	496.4
Total Delay (hr)	441.9	431.5	422.3	429.0
Total Stops	6221	6460	6309	6241
Fuel Used (gal)	187.0	187.2	184.2	185.7

The Cottage Green
Queuing and Blocking Report

2027 Build w/ Imp.
AM Peak

Intersection: 1: Matthews Weddington Rd & Chestnut Ln

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	LTR	LT	R	LT	TR
Maximum Queue (ft)	793	1318	250	218	104	350	1005
Average Queue (ft)	298	789	193	82	10	260	627
95th Queue (ft)	746	1627	348	179	70	459	1345
Link Distance (ft)	1116	1276		301			965
Upstream Blk Time (%)		32		0			52
Queuing Penalty (veh)		0		0			0
Storage Bay Dist (ft)			150		150	250	
Storage Blk Time (%)		71	11	3		64	20
Queuing Penalty (veh)		395	30	8		120	60

Intersection: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	111	79	59	375	1072	204	434	285	350	623	601
Average Queue (ft)	57	22	15	367	957	51	231	63	294	551	182
95th Queue (ft)	106	64	43	418	1319	140	364	191	462	738	567
Link Distance (ft)		1009			1020		589			587	587
Upstream Blk Time (%)					72		0			42	3
Queuing Penalty (veh)					0		0			191	12
Storage Bay Dist (ft)	125		125	275		150		225	250		
Storage Blk Time (%)	1	0		79	23	0	23		1	76	
Queuing Penalty (veh)	0	0		281	86	0	54		6	153	

Intersection: 3: Brayland Ave/Access "B" & Matthews Weddington Rd

Movement	WB	WB	NB	SB
Directions Served	T	R	R	R
Maximum Queue (ft)	595	200	26	358
Average Queue (ft)	536	18	4	167
95th Queue (ft)	780	112	19	371
Link Distance (ft)	589		1080	922
Upstream Blk Time (%)	4			
Queuing Penalty (veh)	49			
Storage Bay Dist (ft)		100		
Storage Blk Time (%)	90			
Queuing Penalty (veh)	6			

Intersection: 4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	102	50	250	1984	389	213	235	129
Average Queue (ft)	45	4	249	1921	150	52	83	27
95th Queue (ft)	88	24	269	2107	337	181	196	102
Link Distance (ft)	1170			1878	865		670	
Upstream Blk Time (%)				91				
Queuing Penalty (veh)				1010				
Storage Bay Dist (ft)		150	150			150		75
Storage Blk Time (%)	0		4	99	18		18	0
Queuing Penalty (veh)	0		34	312	59		19	0

Intersection: 5: Matthews Weddington Rd & Access "C"

Movement	EB	NB	SB	SB
Directions Served	R	T	T	TR
Maximum Queue (ft)	216	6	380	316
Average Queue (ft)	83	0	282	110
95th Queue (ft)	253	4	504	294
Link Distance (ft)	1241	587	301	301
Upstream Blk Time (%)			67	1
Queuing Penalty (veh)			310	7
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 3203

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build w/ Imp.
Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	6	7	268	15	122	28	395	427	237	572	17
Future Volume (vph)	9	6	7	268	15	122	28	395	427	237	572	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	1		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.957			0.907				0.850		0.997	
Flt Protected		0.980		0.950	0.985			0.997			0.986	
Satd. Flow (prot)	0	1747	0	1681	1581	0	0	1857	1583	0	3479	0
Flt Permitted		0.980		0.950	0.985			0.997			0.986	
Satd. Flow (perm)	0	1747	0	1681	1581	0	0	1857	1583	0	3479	0
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1281			1441			496			1129	
Travel Time (s)		34.9			21.8			7.5			17.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	7	8	298	17	136	31	439	474	263	636	19
Shared Lane Traffic (%)				22%								
Lane Group Flow (vph)	0	25	0	232	219	0	0	470	474	0	918	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 73.8%

ICU Level of Service D

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build w/ Imp.
Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh	8.2						
Intersection LOS	A						
Approach	EB	WB		NB		SB	
Entry Lanes	1	2		2		2	
Conflicting Circle Lanes	2	2		1		2	
Adj Approach Flow, veh/h	25	451		944		918	
Demand Flow Rate, veh/h	25	460		963		936	
Vehicles Circulating, veh/h	1221	490		285		353	
Vehicles Exiting, veh/h	68	758		961		597	
Ped Vol Crossing Leg, #/h	0	0		0		0	
Ped Cap Adj	1.000	1.000		1.000		1.000	
Approach Delay, s/veh	7.8	6.8		8.1		9.0	
Approach LOS	A	A		A		A	
Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	L	LTR	LT	R	LT	TR
Assumed Moves	LTR	L	LTR	LT	R	LT	TR
RT Channelized							
Lane Util	1.000	0.530	0.470	0.498	0.502	0.470	0.530
Follow-Up Headway, s	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	25	244	216	480	483	440	496
Cap Entry Lane, veh/h	503	860	936	1096	1096	976	1052
Entry HV Adj Factor	0.995	0.979	0.981	0.980	0.981	0.981	0.981
Flow Entry, veh/h	25	239	212	470	474	432	487
Cap Entry, veh/h	500	842	918	1073	1075	957	1032
V/C Ratio	0.050	0.284	0.231	0.438	0.441	0.451	0.472
Control Delay, s/veh	7.8	7.4	6.2	8.1	8.2	9.1	8.9
LOS	A	A	A	A	A	A	A
95th %tile Queue, veh	0	1	1	2	2	2	3

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	27	32	161	50	207	80	551	312	322	453	36
Future Volume (vph)	85	27	32	161	50	207	80	551	312	322	453	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		125	275		0	150		225	250		0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.879				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1637	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1637	0	1770	1863	1583	1770	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1114			1073			667			652	
Travel Time (s)		30.4			16.3			10.1			9.9	
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)	94	30	36	179	56	230	89	612	347	358	503	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	30	36	179	286	0	89	612	347	358	503	40
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			16			20	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2	3	1	6	7
Permitted Phases			4						2			6

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8		5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	20.0		14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	14.0	16.0	17.0	26.0	28.0		17.0	47.0	26.0	31.0	61.0	14.0
Total Split (%)	11.7%	13.3%	14.2%	21.7%	23.3%		14.2%	39.2%	21.7%	25.8%	50.8%	11.7%
Maximum Green (s)	7.0	9.0	10.0	19.0	21.0		10.0	40.0	19.0	24.0	54.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-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	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Max	None	None	Max	None
Act Effct Green (s)	9.0	10.5	21.2	27.0	22.9		11.3	42.0	74.0	26.0	56.7	70.7
Actuated g/C Ratio	0.08	0.09	0.18	0.23	0.19		0.09	0.35	0.62	0.22	0.47	0.59
v/c Ratio	0.71	0.18	0.13	0.45	0.92		0.53	0.94	0.36	0.93	0.57	0.04
Control Delay	82.5	53.2	38.7	46.8	81.7		63.7	61.3	13.9	78.7	26.3	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.5	53.2	38.7	46.8	81.7		63.7	61.3	13.9	78.7	26.3	10.9
LOS	F	D	D	D	F		E	E	B	E	C	B
Approach Delay		67.2			68.3			45.8			46.4	
Approach LOS		E			E			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 119.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 51.4

Intersection LOS: D

Intersection Capacity Utilization 84.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp.
Timing Plan: PM Peak

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	94	30	36	179	286	89	612	347	358	503	40
v/c Ratio	0.71	0.18	0.13	0.45	0.92	0.53	0.94	0.36	0.93	0.57	0.04
Control Delay	82.5	53.2	38.7	46.8	81.7	63.7	61.3	13.9	78.7	26.3	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.5	53.2	38.7	46.8	81.7	63.7	61.3	13.9	78.7	26.3	10.9
Queue Length 50th (ft)	72	21	22	131	219	66	456	147	274	278	13
Queue Length 95th (ft)	#156	53	51	206	#382	122	#687	210	#457	388	28
Internal Link Dist (ft)		1034			993		587			572	
Turn Bay Length (ft)	125		125	275		150		225	250		
Base Capacity (vph)	132	176	289	402	313	177	652	981	383	880	933
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.17	0.12	0.45	0.91	0.50	0.94	0.35	0.93	0.57	0.04

Intersection Summary

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

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build w/ Imp.

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	892	10	0	698	13	0	0	4	0	0	18
Future Volume (vph)	0	892	10	0	698	13	0	0	4	0	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		0	0		0
Storage Lanes	0		0	0		1	0		1	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		0.999				0.850			0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	1861	0	0	1863	1583	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	1861	0	0	1863	1583	0	0	1611	0	0	1611
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		2073			667			1113			1016	
Travel Time (s)		31.4			10.1			21.7			27.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	991	11	0	776	14	0	0	4	0	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1002	0	0	776	14	0	0	4	0	0	20
Enter Blocked Intersection	No	2 veh	No	No	2 veh	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		4			4			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.6%

ICU Level of Service B

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build w/ Imp.
Timing Plan: PM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱	↱			↱			↱
Traffic Vol, veh/h	0	892	10	0	698	13	0	0	4	0	0	18
Future Vol, veh/h	0	892	10	0	698	13	0	0	4	0	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	100	-	-	0	-	-	0
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	0	991	11	0	776	14	0	0	4	0	0	20

Major/Minor	Major1		Major2		Minor1		Minor2	
Conflicting Flow All	-	0	0	-	-	0	-	997
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	6.22	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	3.318	3.318
Pot Cap-1 Maneuver	0	-	-	0	-	0	296	397
Stage 1	0	-	-	0	-	0	-	-
Stage 2	0	-	-	0	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	296	397
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	17.3	14.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	296	-	-	-	-	397
HCM Lane V/C Ratio	0.015	-	-	-	-	0.05
HCM Control Delay (s)	17.3	-	-	-	-	14.5
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	540	174	262	338	144	66	49	239	151	66	69
Future Volume (vph)	73	540	174	262	338	144	66	49	239	151	66	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.951				0.850			0.850
Flt Protected		0.992		0.950				0.978			0.967	
Satd. Flow (prot)	0	1848	1583	1770	1771	0	0	1814	1583	0	1801	1583
Flt Permitted		0.992		0.950				0.978			0.967	
Satd. Flow (perm)	0	1848	1583	1770	1771	0	0	1814	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.65	0.90	0.90	0.90	0.90	0.78	0.90	0.53	0.90	0.59	0.53	0.61
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Adj. Flow (vph)	112	600	193	291	376	185	73	92	266	256	125	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	712	193	291	561	0	0	165	266	0	381	113
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 87.5%

ICU Level of Service E

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build w/ Imp.
Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh 19.9
Intersection LOS C

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	905		852		431		494	
Demand Flow Rate, veh/h	923		870		440		504	
Vehicles Circulating, veh/h	685		283		987		756	
Vehicles Exiting, veh/h	574		1144		621		397	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	37.7		8.3		12.7		13.5	
Approach LOS	E		A		B		B	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.787	0.213	0.341	0.659	0.384	0.616	0.772	0.228
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	726	197	297	573	169	271	389	115
Cap Entry Lane, veh/h	761	761	1040	1116	578	578	673	747
Entry HV Adj Factor	0.981	0.980	0.980	0.980	0.977	0.982	0.981	0.983
Flow Entry, veh/h	712	193	291	561	165	266	381	113
Cap Entry, veh/h	747	746	1019	1094	565	568	660	734
V/C Ratio	0.954	0.259	0.285	0.513	0.292	0.469	0.578	0.154
Control Delay, s/veh	45.8	7.8	6.4	9.3	10.4	14.2	15.5	6.6
LOS	E	A	A	A	B	B	C	A
95th %tile Queue, veh	14	1	1	3	1	2	4	1

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build w/ Imp.
Timing Plan: PM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					 	
Traffic Volume (vph)	0	28	0	843	783	55
Future Volume (vph)	0	28	0	843	783	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.865			0.990	
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	3504	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	3504	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	1341			652	496	
Travel Time (s)	36.6			9.9	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	31	0	937	870	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	31	0	937	931	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 47.7%

ICU Level of Service A

Analysis Period (min) 15

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build w/ Imp.
Timing Plan: PM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↗↘	
Traffic Vol, veh/h	0	28	0	843	783	55
Future Vol, veh/h	0	28	0	843	783	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	0	937	870	61

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	466	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.93	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.319	-	-	-	-
Pot Cap-1 Maneuver	0	544	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	544	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	544	-	-
HCM Lane V/C Ratio	-	0.057	-	-
HCM Control Delay (s)	-	12	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	3358	3461	3379	3398	3383	3378	3405
Vehs Exited	3337	3416	3355	3376	3387	3341	3352
Starting Vehs	162	132	137	146	155	106	148
Ending Vehs	183	177	161	168	151	143	201
Travel Distance (mi)	2647	2724	2705	2676	2691	2687	2681
Travel Time (hr)	198.2	175.3	173.5	162.3	187.7	180.0	236.1
Total Delay (hr)	126.1	101.1	100.0	89.5	114.5	106.9	163.1
Total Stops	3932	4459	3956	4445	4851	4123	4322
Fuel Used (gal)	128.1	124.8	123.4	121.4	126.7	124.9	137.0

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3464	3319	3407	3393
Vehs Exited	3419	3299	3418	3372
Starting Vehs	130	149	167	139
Ending Vehs	175	169	156	165
Travel Distance (mi)	2720	2607	2701	2684
Travel Time (hr)	183.1	177.9	192.0	186.6
Total Delay (hr)	109.0	107.1	118.7	113.6
Total Stops	5087	3341	4240	4271
Fuel Used (gal)	126.7	121.8	127.7	126.2

Interval #0 Information Seeding

Start Time 6:57
End Time 7:07
Total Time (min) 10
Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time 7:07
End Time 8:07
Total Time (min) 60
Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	3358	3461	3379	3398	3383	3378	3405
Vehs Exited	3337	3416	3355	3376	3387	3341	3352
Starting Vehs	162	132	137	146	155	106	148
Ending Vehs	183	177	161	168	151	143	201
Travel Distance (mi)	2647	2724	2705	2676	2691	2687	2681
Travel Time (hr)	198.2	175.3	173.5	162.3	187.7	180.0	236.1
Total Delay (hr)	126.1	101.1	100.0	89.5	114.5	106.9	163.1
Total Stops	3932	4459	3956	4445	4851	4123	4322
Fuel Used (gal)	128.1	124.8	123.4	121.4	126.7	124.9	137.0

Interval #1 Information Recording

Start Time 7:07
End Time 8:07
Total Time (min) 60
Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	3464	3319	3407	3393
Vehs Exited	3419	3299	3418	3372
Starting Vehs	130	149	167	139
Ending Vehs	175	169	156	165
Travel Distance (mi)	2720	2607	2701	2684
Travel Time (hr)	183.1	177.9	192.0	186.6
Total Delay (hr)	109.0	107.1	118.7	113.6
Total Stops	5087	3341	4240	4271
Fuel Used (gal)	126.7	121.8	127.7	126.2

Intersection: 1: Matthews Weddington Rd & Chestnut Ln

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	L	LTR	LT	R	LT	TR
Maximum Queue (ft)	38	116	68	174	79	344	629
Average Queue (ft)	8	49	15	89	20	230	193
95th Queue (ft)	32	87	50	154	60	393	602
Link Distance (ft)	1116	1276		301			965
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)			150		150	250	
Storage Blk Time (%)		0	0	1		32	4
Queuing Penalty (veh)		0	0	4		96	20

Intersection: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	141	113	73	256	408	250	616	325	350	579	111
Average Queue (ft)	66	26	21	112	219	96	330	182	272	319	17
95th Queue (ft)	123	76	56	224	382	224	543	376	391	586	80
Link Distance (ft)		1062			1020		591			587	587
Upstream Blk Time (%)							2			4	0
Queuing Penalty (veh)							18			15	0
Storage Bay Dist (ft)	125		125	275		150		225	250		
Storage Blk Time (%)	3	0			9	1	37	0	24	11	
Queuing Penalty (veh)	2	0			15	6	146	0	110	35	

Intersection: 3: Brayland Ave/Access "B" & Matthews Weddington Rd

Movement	EB	NB	SB
Directions Served	TR	R	R
Maximum Queue (ft)	127	28	34
Average Queue (ft)	7	4	10
95th Queue (ft)	67	18	31
Link Distance (ft)	1878	1080	971
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	LT	R	LT	R
Maximum Queue (ft)	1219	250	222	281	74	55	134	70
Average Queue (ft)	1019	241	64	87	31	21	61	8
95th Queue (ft)	1495	314	144	188	61	57	110	41
Link Distance (ft)	1170			1878	865		670	
Upstream Blk Time (%)	59							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)		150	150			150		75
Storage Blk Time (%)	98		0	3			7	0
Queuing Penalty (veh)	171		1	8			5	0

Intersection: 5: Matthews Weddington Rd & Access "C"

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	78	187	56
Average Queue (ft)	25	29	4
95th Queue (ft)	66	159	37
Link Distance (ft)	1291	301	301
Upstream Blk Time (%)		1	
Queuing Penalty (veh)		4	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 655

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build w/ Imp. +5
Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	26	16	593	7	309	10	640	321	131	405	5
Future Volume (vph)	23	26	16	593	7	309	10	640	321	131	405	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	1		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.963			0.903				0.850		0.999	
Flt Protected		0.983		0.950	0.983			0.999			0.990	
Satd. Flow (prot)	0	1763	0	1665	1566	0	0	1861	1583	0	3500	0
Flt Permitted		0.983		0.950	0.983			0.999			0.990	
Satd. Flow (perm)	0	1763	0	1665	1566	0	0	1861	1583	0	3500	0
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1281			1441			496			1129	
Travel Time (s)		34.9			21.8			7.5			17.1	
Peak Hour Factor	0.90	0.90	0.75	0.80	0.90	0.90	0.75	0.83	0.83	0.90	0.75	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	26	29	21	741	8	343	13	771	387	146	540	6
Shared Lane Traffic (%)				24%								
Lane Group Flow (vph)	0	76	0	563	529	0	0	784	387	0	692	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 92.1%

ICU Level of Service F

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build w/ Imp. +5

Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh 20.6
Intersection LOS C

Approach	EB	WB	NB	SB
Entry Lanes	1	2	2	2
Conflicting Circle Lanes	2	2	1	2
Adj Approach Flow, veh/h	76	1092	1171	692
Demand Flow Rate, veh/h	78	1121	1194	706
Vehicles Circulating, veh/h	1463	826	206	784
Vehicles Exiting, veh/h	27	574	1335	1163
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	12.0	36.6	10.7	13.2
Approach LOS	B	E	B	B

Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	L	LTR	LT	R	LT	TR
Assumed Moves	LTR	L	LTR	LT	R	LT	TR
RT Channelized							
Lane Util	1.000	0.530	0.470	0.669	0.331	0.470	0.530
Follow-Up Headway, s	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	78	594	527	799	395	332	374
Cap Entry Lane, veh/h	409	631	704	1177	1177	656	729
Entry HV Adj Factor	0.980	0.974	0.974	0.981	0.980	0.980	0.981
Flow Entry, veh/h	76	579	513	784	387	325	367
Cap Entry, veh/h	401	615	685	1155	1153	643	715
V/C Ratio	0.191	0.941	0.749	0.679	0.336	0.506	0.513
Control Delay, s/veh	12.0	48.8	23.0	12.8	6.4	13.7	12.8
LOS	B	E	C	B	A	B	B
95th %tile Queue, veh	1	13	7	6	1	3	3

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp. +5

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	25	25	424	27	364	48	533	207	222	764	21
Future Volume (vph)	75	25	25	424	27	364	48	533	207	222	764	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		125	275		0	150		225	250		0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.860				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1602	0	1770	1863	1568	1736	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1602	0	1770	1863	1568	1736	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1061			1073			667			652	
Travel Time (s)		28.9			16.3			10.1			9.9	
Peak Hour Factor	0.90	0.90	0.90	0.82	0.90	0.90	0.90	0.75	0.75	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	3%	4%	2%	2%
Adj. Flow (vph)	83	28	28	517	30	404	53	711	276	247	849	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	28	28	517	434	0	53	711	276	247	849	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			16			20	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2	3	1	6	7

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp. +5

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4						2			6
Detector Phase	7	4	5	3	8		5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	20.0		14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	14.0	14.0	14.0	44.0	44.0		14.0	58.0	44.0	24.0	68.0	14.0
Total Split (%)	10.0%	10.0%	10.0%	31.4%	31.4%		10.0%	41.4%	31.4%	17.1%	48.6%	10.0%
Maximum Green (s)	7.0	7.0	7.0	37.0	37.0		7.0	51.0	37.0	17.0	61.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-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	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Max	None	None	Max	None
Act Effct Green (s)	9.0	9.0	17.4	44.6	39.0		9.0	53.0	102.6	19.0	65.8	79.8
Actuated g/C Ratio	0.06	0.06	0.12	0.32	0.28		0.06	0.38	0.73	0.14	0.47	0.57
v/c Ratio	0.73	0.24	0.14	0.92	0.97		0.47	1.01	0.24	1.05	0.97	0.03
Control Delay	98.5	67.4	53.0	68.8	86.2		77.2	79.1	7.4	129.7	61.0	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.5	67.4	53.0	68.8	86.2		77.2	79.1	7.4	129.7	61.0	14.6
LOS	F	E	D	E	F		E	E	A	F	E	B
Approach Delay		83.1			76.8			60.0			75.2	
Approach LOS		F			E			E			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 71.1

Intersection Capacity Utilization 92.5%

Analysis Period (min) 15

Intersection LOS: E

ICU Level of Service F

Splits and Phases: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp. +5

Timing Plan: AM Peak

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	28	28	517	434	53	711	276	247	849	23
v/c Ratio	0.73	0.24	0.14	0.92	0.97	0.47	1.01	0.24	1.05	0.97	0.03
Control Delay	98.5	67.4	53.0	68.8	86.2	77.2	79.1	7.4	129.7	61.0	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.5	67.4	53.0	68.8	86.2	77.2	79.1	7.4	129.7	61.0	14.6
Queue Length 50th (ft)	76	25	22	~511	393	47	~656	86	~244	~787	9
Queue Length 95th (ft)	#163	59	52	#630	#612	95	631	100	#420	#1065	23
Internal Link Dist (ft)		981			993		587			572	
Turn Bay Length (ft)	125		125	275		150		225	250		
Base Capacity (vph)	113	119	196	564	446	113	705	1149	235	875	902
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.24	0.14	0.92	0.97	0.47	1.01	0.24	1.05	0.97	0.03

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build w/ Imp. +5

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	784	5	0	1204	7	0	0	6	0	0	17
Future Volume (vph)	0	784	5	0	1204	7	0	0	6	0	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		0	0		0
Storage Lanes	0		0	0		1	0		1	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		0.999				0.850			0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	1861	0	0	1863	1583	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	1861	0	0	1863	1583	0	0	1611	0	0	1611
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		2073			667			1113			967	
Travel Time (s)		31.4			10.1			21.7			26.4	
Peak Hour Factor	0.90	0.83	0.90	0.90	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	945	6	0	1353	8	0	0	7	0	0	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	951	0	0	1353	8	0	0	7	0	0	19
Enter Blocked Intersection	No	2 veh	No	No	2 veh	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		4			4			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 73.4%

ICU Level of Service D

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build w/ Imp. +5

Timing Plan: AM Peak

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱	↱			↱			↱
Traffic Vol, veh/h	0	784	5	0	1204	7	0	0	6	0	0	17
Future Vol, veh/h	0	784	5	0	1204	7	0	0	6	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	100	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	83	90	90	89	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	945	6	0	1353	8	0	0	7	0	0	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	948	-	-	1353
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	316	0	0	183
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	316	-	-	183
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			16.6			26.9		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	316	-	-	-	-	183
HCM Lane V/C Ratio	0.021	-	-	-	-	0.103
HCM Control Delay (s)	16.6	-	-	-	-	26.9
HCM Lane LOS	C	-	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.3

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build w/ Imp. +5

Timing Plan: AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	237	60	345	699	181	389	117	364	148	69	117
Future Volume (vph)	84	237	60	345	699	181	389	117	364	148	69	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.959				0.850			0.850
Flt Protected		0.982		0.950				0.967			0.967	
Satd. Flow (prot)	0	1806	1553	1770	1786	0	0	1796	1583	0	1801	1583
Flt Permitted		0.982		0.950				0.967			0.967	
Satd. Flow (perm)	0	1806	1553	1770	1786	0	0	1796	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.57	0.90	0.90	0.90	0.90	0.62	0.90	0.61	0.90	0.50	0.52	0.55
Heavy Vehicles (%)	2%	4%	4%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	147	263	67	383	777	292	432	192	404	296	133	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	410	67	383	1069	0	0	624	404	0	429	213
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 109.3%

ICU Level of Service H

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build w/ Imp. +5
Timing Plan: AM Peak

Intersection

Intersection Delay, s/veh 117.4
Intersection LOS F

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	477		1452		1028		642	
Demand Flow Rate, veh/h	494		1482		1051		655	
Vehicles Circulating, veh/h	829		789		726		1625	
Vehicles Exiting, veh/h	1451		988		597		646	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	16.4		188.8		25.8		177.6	
Approach LOS	C		F		D		F	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.858	0.142	0.264	0.736	0.608	0.392	0.669	0.331
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	424	70	391	1091	639	412	438	217
Cap Entry Lane, veh/h	668	668	653	726	733	733	303	357
Entry HV Adj Factor	0.968	0.957	0.980	0.980	0.977	0.981	0.980	0.982
Flow Entry, veh/h	410	67	383	1069	624	404	429	213
Cap Entry, veh/h	646	639	640	712	716	719	297	350
V/C Ratio	0.635	0.105	0.599	1.502	0.871	0.562	1.447	0.608
Control Delay, s/veh	17.9	6.8	16.6	250.4	33.4	14.0	251.8	28.1
LOS	C	A	C	F	D	B	F	D
95th %tile Queue, veh	5	0	4	52	11	4	23	4

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build w/ Imp. +5
Timing Plan: AM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	25	0	972	981	35
Future Volume (vph)	0	25	0	972	981	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.865			0.995	
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	3522	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	3522	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	1290			652	496	
Travel Time (s)	35.2			9.9	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	28	0	1080	1090	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	28	0	1080	1129	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.5%

ICU Level of Service A

Analysis Period (min) 15

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build w/ Imp. +5

Timing Plan: AM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	25	0	972	981	35
Future Vol, veh/h	0	25	0	972	981	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	28	0	1080	1090	39

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	565	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.93	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.319	-
Pot Cap-1 Maneuver	0	469	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	469	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	469	-	-
HCM Lane V/C Ratio	-	0.059	-	-
HCM Control Delay (s)	-	13.2	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build w/ Imp. +5

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	7	8	291	16	134	31	431	468	262	626	18
Future Volume (vph)	10	7	8	291	16	134	31	431	468	262	626	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		150	250		0
Storage Lanes	0		0	1		1	0		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.957			0.906				0.850		0.997	
Flt Protected		0.981		0.950	0.985			0.997			0.986	
Satd. Flow (prot)	0	1749	0	1681	1579	0	0	1857	1583	0	3479	0
Flt Permitted		0.981		0.950	0.985			0.997			0.986	
Satd. Flow (perm)	0	1749	0	1681	1579	0	0	1857	1583	0	3479	0
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1281			1441			496			1129	
Travel Time (s)		34.9			21.8			7.5			17.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	8	9	323	18	149	34	479	520	291	696	20
Shared Lane Traffic (%)				22%								
Lane Group Flow (vph)	0	28	0	252	238	0	0	513	520	0	1007	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 79.1%

ICU Level of Service D

Analysis Period (min) 15

The Cottage Green
1: Matthews Weddington Rd & Chestnut Ln

2027 Build w/ Imp. +5

Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh 9.3
Intersection LOS A

Approach	EB	WB	NB	SB
Entry Lanes	1	2	2	2
Conflicting Circle Lanes	2	2	1	2
Adj Approach Flow, veh/h	28	490	1033	1007
Demand Flow Rate, veh/h	28	499	1054	1027
Vehicles Circulating, veh/h	1336	535	316	382
Vehicles Exiting, veh/h	73	835	1048	652
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.8	7.5	9.2	10.3
Approach LOS	A	A	A	B

Lane	Left	Left	Right	Left	Right	Left	Right
Designated Moves	LTR	L	LTR	LT	R	LT	TR
Assumed Moves	LTR	L	LTR	LT	R	LT	TR
RT Channelized							
Lane Util	1.000	0.529	0.471	0.497	0.503	0.470	0.530
Follow-Up Headway, s	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	28	264	235	524	530	483	544
Cap Entry Lane, veh/h	456	825	901	1065	1065	950	1026
Entry HV Adj Factor	0.994	0.983	0.979	0.980	0.981	0.980	0.981
Flow Entry, veh/h	28	260	230	513	520	473	534
Cap Entry, veh/h	454	811	882	1044	1045	931	1007
V/C Ratio	0.061	0.320	0.261	0.492	0.498	0.508	0.530
Control Delay, s/veh	8.8	8.1	6.8	9.2	9.3	10.3	10.2
LOS	A	A	A	A	A	B	B
95th %tile Queue, veh	0	1	1	3	3	3	3

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp. +5

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	27	32	179	50	229	80	609	345	355	497	36
Future Volume (vph)	85	27	32	179	50	229	80	609	345	355	497	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		125	275		0	150		225	250		0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.877				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1634	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1634	0	1770	1863	1583	1770	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			45			45	
Link Distance (ft)		1114			1073			667			652	
Travel Time (s)		30.4			16.3			10.1			9.9	
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)	94	30	36	199	56	254	89	677	383	394	552	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	30	36	199	310	0	89	677	383	394	552	40
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			16			20	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2	3	1	6	7
Permitted Phases			4						2			6

The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp. +5

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8		5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	20.0		14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	14.0	14.0	17.0	27.0	27.0		17.0	48.0	27.0	31.0	62.0	14.0
Total Split (%)	11.7%	11.7%	14.2%	22.5%	22.5%		14.2%	40.0%	22.5%	25.8%	51.7%	11.7%
Maximum Green (s)	7.0	7.0	10.0	20.0	20.0		10.0	41.0	20.0	24.0	55.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-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	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Max	None	None	Max	None
Act Effct Green (s)	9.0	9.3	20.0	27.3	22.0		11.3	43.0	75.3	26.0	57.7	71.7
Actuated g/C Ratio	0.08	0.08	0.17	0.23	0.18		0.09	0.36	0.63	0.22	0.48	0.60
v/c Ratio	0.71	0.21	0.14	0.49	1.04		0.53	1.01	0.39	1.03	0.62	0.04
Control Delay	82.7	55.8	40.3	47.4	109.9		63.8	77.3	13.5	99.9	26.9	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.7	55.8	40.3	47.4	109.9		63.8	77.3	13.5	99.9	26.9	10.5
LOS	F	E	D	D	F		E	E	B	F	C	B
Approach Delay		68.1			85.5			55.0			55.4	
Approach LOS		E			F			D			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 61.4

Intersection Capacity Utilization 91.0%

Analysis Period (min) 15

Intersection LOS: E

ICU Level of Service E

Splits and Phases: 2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd



The Cottage Green
2: Matthews Weddington Rd & Access "A"/Antioch Ch Rd

2027 Build w/ Imp. +5
Timing Plan: PM Peak

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	94	30	36	199	310	89	677	383	394	552	40
v/c Ratio	0.71	0.21	0.14	0.49	1.04	0.53	1.01	0.39	1.03	0.62	0.04
Control Delay	82.7	55.8	40.3	47.4	109.9	63.8	77.3	13.5	99.9	26.9	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.7	55.8	40.3	47.4	109.9	63.8	77.3	13.5	99.9	26.9	10.5
Queue Length 50th (ft)	72	22	22	145	~258	66	~536	159	~326	311	12
Queue Length 95th (ft)	#156	54	52	224	#439	122	#784	225	#523	432	28
Internal Link Dist (ft)		1034			993		587			572	
Turn Bay Length (ft)	125		125	275		150		225	250		
Base Capacity (vph)	132	143	272	407	299	177	667	997	383	895	945
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.21	0.13	0.49	1.04	0.50	1.01	0.38	1.03	0.62	0.04

Intersection Summary

- ~ 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.

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build w/ Imp. +5

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	977	11	0	766	13	0	0	4	0	0	18
Future Volume (vph)	0	977	11	0	766	13	0	0	4	0	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		0	0		0
Storage Lanes	0		0	0		1	0		1	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		0.999				0.850			0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	1861	0	0	1863	1583	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	1861	0	0	1863	1583	0	0	1611	0	0	1611
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		2073			667			1113			1016	
Travel Time (s)		31.4			10.1			21.7			27.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1086	12	0	851	14	0	0	4	0	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1098	0	0	851	14	0	0	4	0	0	20
Enter Blocked Intersection	No	2 veh	No	No	2 veh	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		4			4			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 62.1%

ICU Level of Service B

Analysis Period (min) 15

The Cottage Green
3: Brayland Ave/Access "B" & Matthews Weddington Rd

2027 Build w/ Imp. +5

Timing Plan: PM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱	↱			↱			↱
Traffic Vol, veh/h	0	977	11	0	766	13	0	0	4	0	0	18
Future Vol, veh/h	0	977	11	0	766	13	0	0	4	0	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	100	-	-	0	-	-	0
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	0	1086	12	0	851	14	0	0	4	0	0	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	1092	-	-	851
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	261	0	0	360
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	261	-	-	360
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			19			15.6		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	261	-	-	-	-	360
HCM Lane V/C Ratio	0.017	-	-	-	-	0.056
HCM Control Delay (s)	19	-	-	-	-	15.6
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.2

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build w/ Imp. +5

Timing Plan: PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	592	192	287	370	159	72	54	261	167	72	76
Future Volume (vph)	80	592	192	287	370	159	72	54	261	167	72	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	150		0	0		150	0		75
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.950				0.850			0.850
Flt Protected		0.992		0.950				0.978			0.967	
Satd. Flow (prot)	0	1848	1583	1770	1770	0	0	1814	1583	0	1801	1583
Flt Permitted		0.992		0.950				0.978			0.967	
Satd. Flow (perm)	0	1848	1583	1770	1770	0	0	1814	1583	0	1801	1583
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1334			2073			1030			835	
Travel Time (s)		20.2			31.4			15.6			22.8	
Peak Hour Factor	0.65	0.90	0.90	0.90	0.90	0.78	0.90	0.53	0.90	0.59	0.53	0.61
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Adj. Flow (vph)	123	658	213	319	411	204	80	102	290	283	136	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	781	213	319	615	0	0	182	290	0	419	125
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

Intersection Capacity Utilization 94.4%

ICU Level of Service F

Analysis Period (min) 15

The Cottage Green
4: Matthews Weddington Rd & Tilley Morris Rd & Union Day School

2027 Build w/ Imp. +5

Timing Plan: PM Peak

Intersection

Intersection Delay, s/veh 33.8
Intersection LOS D

Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		2	
Conflicting Circle Lanes	1		2		1		2	
Adj Approach Flow, veh/h	994		934		472		544	
Demand Flow Rate, veh/h	1013		952		482		556	
Vehicles Circulating, veh/h	753		311		1085		826	
Vehicles Exiting, veh/h	628		1256		681		437	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	74.2		9.4		16.0		17.5	
Approach LOS	F		A		C		C	
Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	L	TR	LT	R	LT	R
Assumed Moves	LT	R	L	TR	LT	R	LT	R
RT Channelized								
Lane Util	0.786	0.214	0.341	0.659	0.386	0.614	0.770	0.230
Follow-Up Headway, s	2.535	2.535	2.667	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	4.645	4.328	4.544	4.544	4.645	4.328
Entry Flow, veh/h	796	217	325	627	186	296	428	128
Cap Entry Lane, veh/h	716	716	1014	1090	529	529	631	704
Entry HV Adj Factor	0.981	0.982	0.982	0.981	0.978	0.980	0.980	0.977
Flow Entry, veh/h	781	213	319	615	182	290	419	125
Cap Entry, veh/h	702	702	995	1069	518	518	619	687
V/C Ratio	1.112	0.303	0.321	0.575	0.352	0.560	0.678	0.182
Control Delay, s/veh	92.0	8.9	6.9	10.7	12.4	18.2	20.6	7.3
LOS	F	A	A	B	B	C	C	A
95th %tile Queue, veh	23	1	1	4	2	3	5	1

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build w/ Imp. +5
Timing Plan: PM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					 	
Traffic Volume (vph)	0	28	0	923	860	55
Future Volume (vph)	0	28	0	923	860	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.865			0.991	
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	3507	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	3507	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	1341			652	496	
Travel Time (s)	36.6			9.9	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	31	0	1026	956	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	31	0	1026	1017	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 51.9%

ICU Level of Service A

Analysis Period (min) 15

The Cottage Green
5: Matthews Weddington Rd & Access "C"

2027 Build w/ Imp. +5

Timing Plan: PM Peak

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	28	0	923	860	55
Future Vol, veh/h	0	28	0	923	860	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	0	1026	956	61

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	509	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.93	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.319	-
Pot Cap-1 Maneuver	0	510	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	510	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	510	-	-
HCM Lane V/C Ratio	-	0.061	-	-
HCM Control Delay (s)	-	12.5	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-