Benns Church Master TIA

Isle of Wight, Virginia

July 2023

Kimley»Horn

Traffic Impact Analysis
for
Benns Church Master TIA
Isle of Wight, Virginia

Prepared for:
Harrison and Lear, Inc.

Prepared by:

Kimley-Horn and Associates, Inc.
4525 Main Street, Suite 1000
Virginia Beach, VA 23606
P: 757.213.8600 F: 757.213.8601

Kimley-Horn Project Number: 116596002
July 2023

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1.0 EXECUTIVE SUMMARY

1.1 PROJECT BACKGROUND

The purpose of the Benns Church TIA is to serve as a planning level document to analyze existing and future traffic conditions within the study area, identify necessary roadway improvements in order to serve future traffic demands, and determine potential long-term solutions along Benns Church Boulevard to support planning efforts for Isle of Wight County, the Town of Smithfield, and the Virginia Department of Transportation.

A study work group (SWG) was formed to obtain concurrence on study assumptions and identify potential roadway improvements within the study area. The SWG included members from the following organizations:

- Virginia Department of Transportation (VDOT)
- Isle of Wight County
- Town of Smithfield
- Harrison and Lear, Inc.
- Greenwood Homes
- Kimley-Horn and Associates

The SWG regularly held meetings throughout the duration of the project to determine the study area, develop study assumptions, discuss operational analysis results, and identify potential roadway improvements within the study area. The study area was determined to include four (4) existing intersections along Benns Church Boulevard and eight (8) proposed study intersections. The intersections included in this study are included below:

1. Benns Church Boulevard (U.S. Route 258/State Route 10) at Cypress Run Drive (Signalized)
2. Benns Church Boulevard at Tractor Supply Entrance (Unsignalized – Right-In/Right-Out)
3. Benns Church Boulevard at Turner Drive (State Route 644) (Signalized)
4. Benns Church Boulevard at Red Oak Drive (Unsignalized – Full Movement)
5. Benns Church Boulevard at Site Driveway #1
6. Benns Church Boulevard at Site Driveway #2
7. Benns Church Boulevard at Site Driveway #3
8. Tractor Supply Entrance at Site Driveway #4
9. Turner Drive at Site Driveway #5
10. Tractor Supply Entrance at Site Driveway #6
11. Site Driveway #3 at Site Driveway #5
12. Benns Church Boulevard at Site Driveway #7

This TIA includes an analysis for the following scenarios as described below:

- Scenario 1 – Existing (2022) traffic conditions
- Scenario 2 – Interim Year (2025) No-Build – Interim year traffic conditions (i.e., future traffic volumes *with* a 1.0% growth rate applied *without* projected site traffic) with existing roadway conditions.

- Scenario 3 – Interim Year (2025) Build – Interim year traffic conditions (i.e., future traffic volumes *with* a 1.0% growth rate applied *with* projected site traffic) with proposed roadway improvements. The projected site traffic includes the following proposed developments:
    - Turner North – Parcels 2 and 5
    - Turner South – Parcels 6 and 13
- Scenario 4 – Future Year (2029) Build – Future year traffic conditions (i.e., future traffic volumes *with* a 1.0% growth rate applied *with* projected site traffic) with proposed roadway improvements. The projected site traffic includes the following proposed developments:
    - Turner North – Full Build-Out
    - Turner South – Full Build-Out
    - 50% of Smithfield Development
    - Smithfield Intermediate School
    - Sweetgrass – Full Build-Out
- Scenario 5 – Horizon Year (2045) Build – Horizon year traffic conditions (i.e., future traffic volumes *with* a 1.0% growth rate applied *with* projected site traffic) with proposed roadway improvements. The projected site traffic includes the following proposed developments:
    - Turner North – Full Build-Out
    - Turner South – Full Build-Out
    - Smithfield Development – Full Build-Out
    - Smithfield Intermediate School
    - Sweetgrass – Full Build-Out

1.2 PROPOSED RECOMMENDATIONS

Based on the operational analysis and discussions with the SWG, several recommendations were recommended at the study area intersections. These recommendations are summarized below:

Interim Year (2025) Recommendations

- Turn lane improvements as described below:
    - Exclusive southbound right-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #1 *(Int. #5)*
    - Exclusive southbound right-turn lane with a storage length of 100 feet and a 100-foot taper at the intersection of Benns Church Boulevard and Site Driveway #2 *(Int. #6)*
    - Extend the existing exclusive northbound left-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7).* It should be noted that an increase in storage length for this movements is warranted and recommended in 2029. It is recommended that the full turn lane with a storage length of 200 feet and a 200-foot taper be constructed in 2025 when the connection to Benns Church Boulevard is made.
- Single-Lane Roundabout at the intersection of Turner Drive and Site Driveway #5 *(Int. #9)*
- Modify eastbound approach geometry at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to include the following laneage:

- Exclusive left-turn lane
- Shared through-left turn lane
- Exclusive right-turn lane with a storage length of 250 feet and a 115-foot taper

Future Year (2029) Recommendations

In addition to the recommendations included in the 2025 analysis scenarios, the following recommendations are included in the 2029 analysis scenarios:

- Turn lane improvements as described below:
  - Exclusive southbound right-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Tractor Supply Entrance *(Int. #2)*
  - Exclusive northbound left-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive northbound right-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive southbound left-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive southbound right-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
- Install a traffic signal at the intersection of Benns Church Boulevard and Site Driveway #3/Sweetgrass Driveway *(Int. #7).* This traffic signal will be completed as part of the Sweetgrass development.
- Provide an additional exclusive northbound left-turn lane at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to provide a dual-left turn movement

Horizon Year (2045) Recommendations

In addition to the recommendations included in the 2029 analysis scenarios and the proposed turn lane improvements, the following recommendations are included in the 2045 analysis scenarios:

- Widen Benns Church Boulevard to a six-lane roadway (three lanes in each direction) within the study area
- Modify the westbound approach geometry at the intersection of Benns Church Boulevard and Cypress Run Drive *(Int. #1)* to include the following laneage:
  - Exclusive left-turn lane
  - Shared through-left turn lane
  - Exclusive right-turn lane with a storage length of 100 feet and a 100-foot taper
- Modify the westbound approach geometry at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to include the following laneage:
  - Exclusive left-turn lane
  - Shared through-left turn lane
  - Exclusive right-turn lane with a storage length of 100 feet and a 100-foot taper

The proposed roadway improvements are also summarized in Figures **ES-1** through **ES-3**.

1.3 OVERALL SITE TRAFFIC CONTRIBUTION

In order to support the implementation of the proposed improvements recommended as part of this TIA, site traffic assignments were reviewed to determine the breakdown of traffic under the 2025 and 2029 Build scenarios as it pertains to each development. **Table 1** and **Table 2** summarize the percent of traffic by development (i.e., Turner North & South, Cypress Run South, and background traffic) at the locations where roadway improvements are recommended. This data is provided for informational purposes only and may be utilized by the SWG to aid in the determination of cost-sharing when implementing the proposed improvements.

Table 1: 2025 Peak Hour Site Traffic Breakdown

2025 Build Scenario									
No.	Intersection	AM Peak Hour Traffic by Source				PM Peak Hour			
		Turner North & South	Cypress Run South	Other	Total	Turner North & South	Cypress Run South	Other	Total
1	Benns Church Blvd at Cypress Run Dr	No Recommendations							
2	Benns Church Blvd at Tractor Supply	No Recommendations							
3	Benns Church Blvd at Turner Dr	9%	0%	91%	*100%*	7%	0%	93%	*100%*
4	Benns Church Blvd at Red Oak Dr	No Recommendations							
5	Benns Church Blvd at Site Driveway	8%	0%	92%	*100%*	6%	0%	94%	*100%*
6	Benns Church Blvd at Site Driveway	7%	0%	93%	*100%*	4%	0%	96%	*100%*
7	Benns Church Blvd at Site Driveway/Sweetgrass	5%	0%	95%	*100%*	4%	0%	96%	*100%*
8	Tractor Supply Entrance at Site Driveway	No Recommendations							
9	Turner Drive at Site Driveway	31%	0%	69%	*100%*	36%	0%	64%	*100%*
10	Tractor Supply Entrance at Site Driveway	No Recommendations							
11	Turner Drive at Site Driveway	No Recommendations							
12	Benns Church Blvd at Site Driveway	No Recommendations							

Table 2: 2025 Peak Hour Site Traffic Breakdown

2029 Build Scenario									
No.	Intersection	AM Peak Hour Traffic by Source				PM Peak Hour			
		Turner North & South	Cypress Run South	Other	Total	Turner North & South	Cypress Run South	Other	Total
1	Benns Church Blvd at Cypress Run Dr	No Recommendations							
2	Benns Church Blvd at Tractor Supply	10%	3%	87%	*100%*	7%	4%	89%	*100%*
3	Benns Church Blvd at Turner Dr	10%	2%	88%	*100%*	7%	3%	90%	*100%*
4	Benns Church Blvd at Red Oak Dr	No Recommendations							
5	Benns Church Blvd at Site Driveway	10%	3%	87%	*100%*	7%	3%	90%	*100%*
6	Benns Church Blvd at Site Driveway	7%	2%	91%	*100%*	5%	2%	93%	*100%*
7	Benns Church Blvd at Site Driveway/Sweetgrass	10%	2%	88%	*100%*	7%	2%	91%	*100%*
8	Tractor Supply Entrance at Site Driveway	No Recommendations							
9	Turner Drive at Site Driveway	25%	2%	73%	*100%*	26%	3%	71%	*100%*
10	Tractor Supply Entrance at Site Driveway	No Recommendations							
11	Turner Drive at Site Driveway	No Recommendations							
12	Benns Church Blvd at Site Driveway	12%	3%	85%	*100%*	7%	3%	90%	*100%*

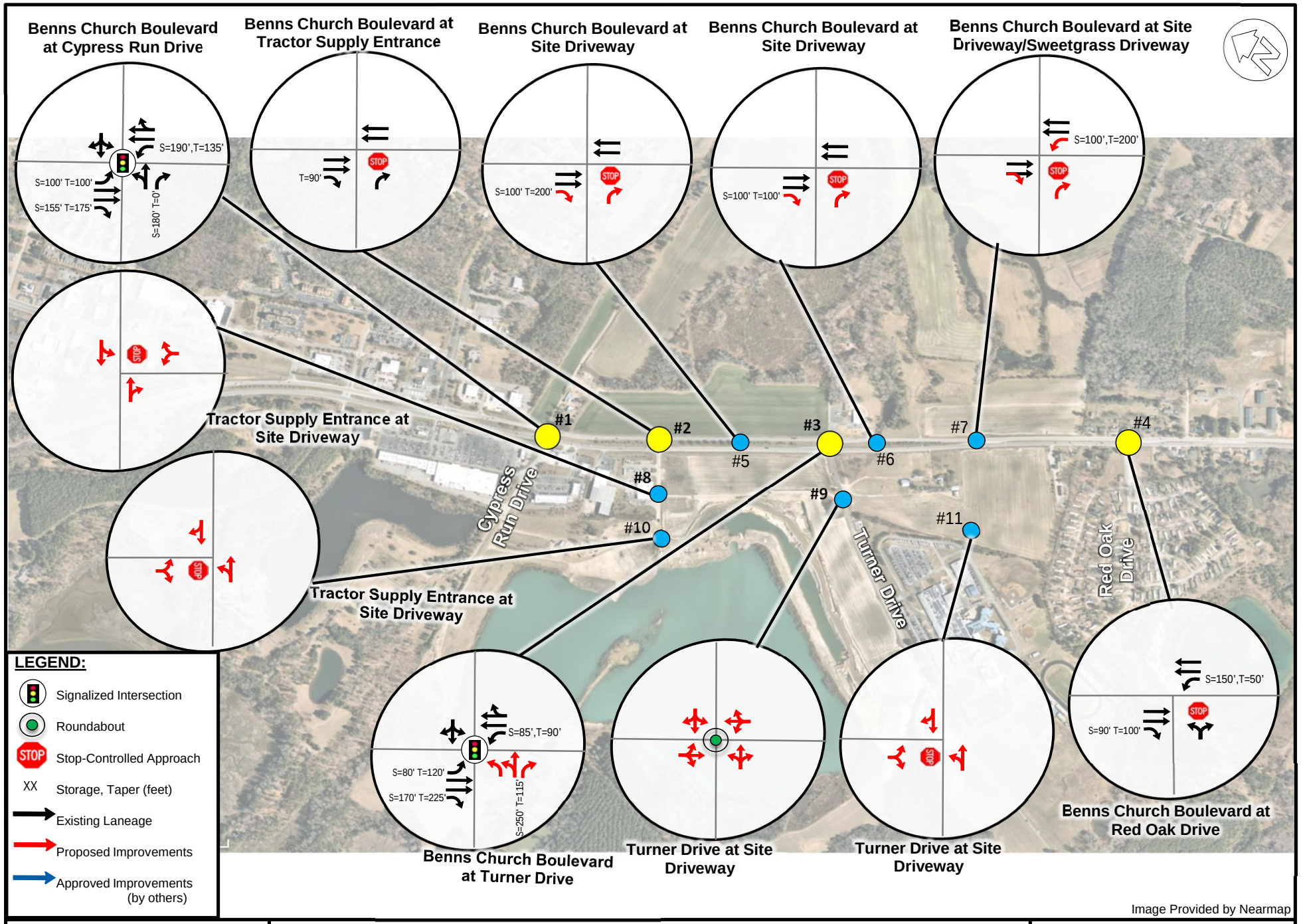
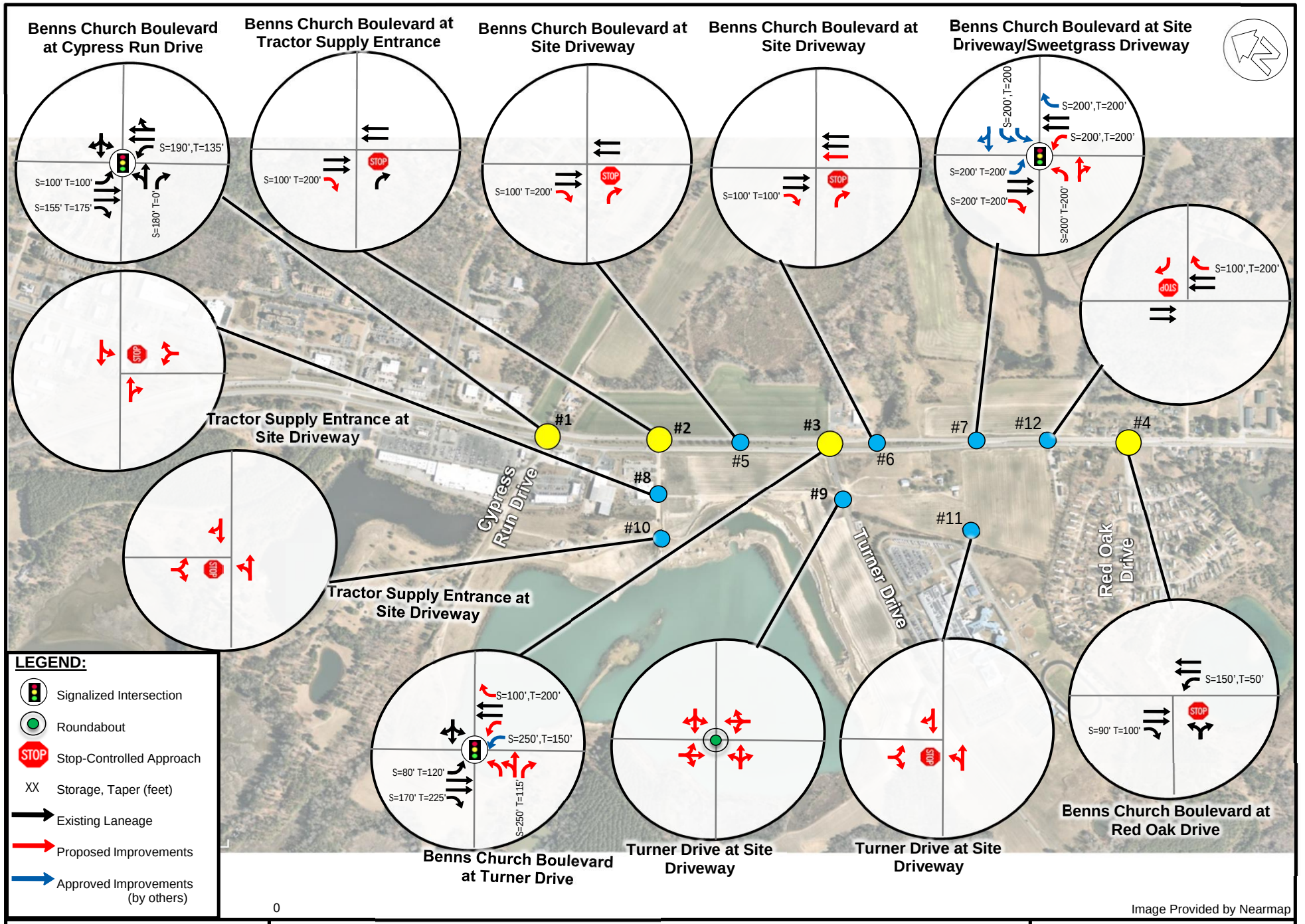


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INTERIM YEAR (2025) RECOMMENDATIONS

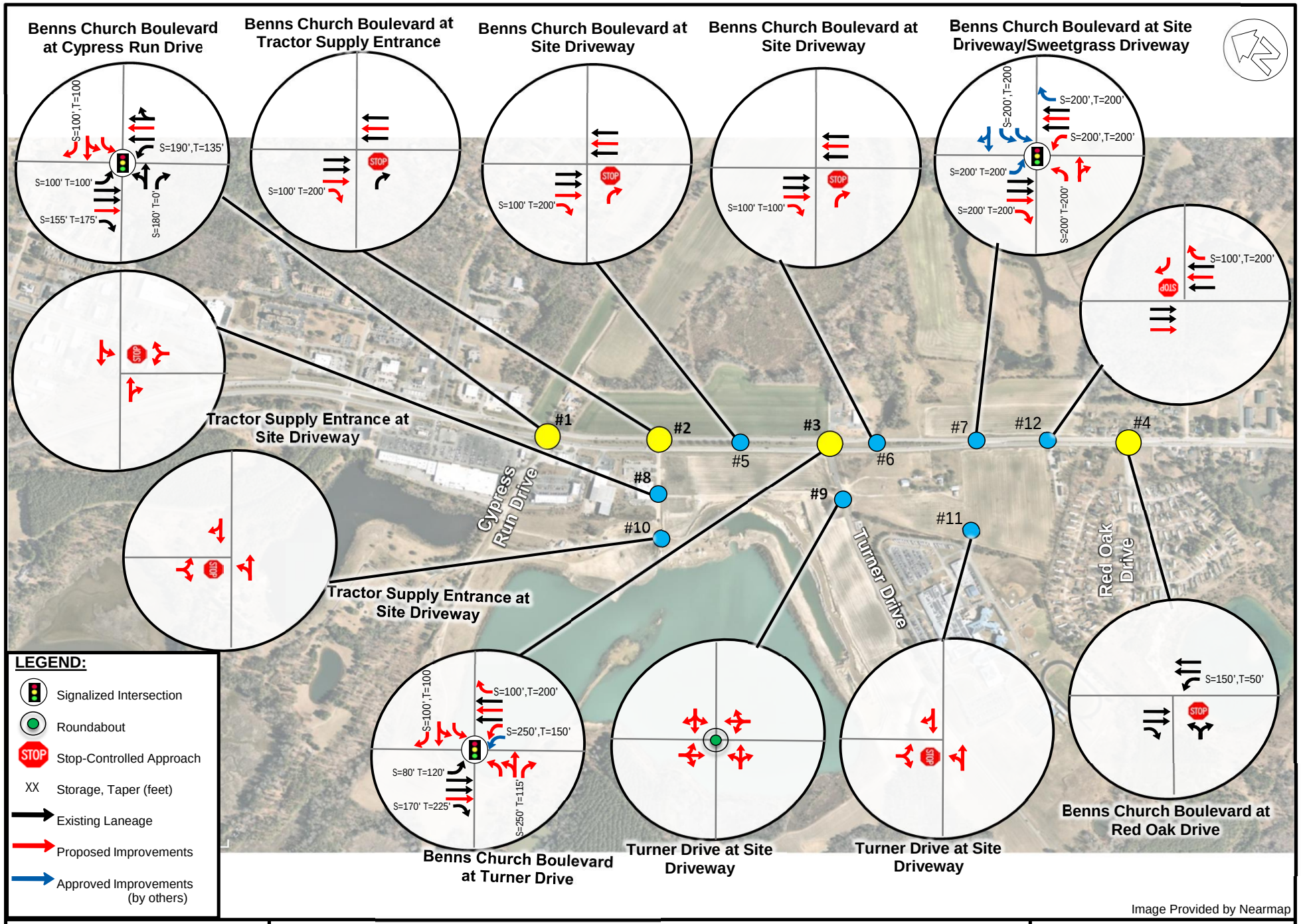
FIGURE ES-1



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FUTURE YEAR (2029) RECOMMENDATIONS

FIGURE ES-2



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HORIZON YEAR (2045) RECOMMENDATIONS

FIGURE ES-3

2.0 INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) was retained to perform a traffic impact analysis (TIA) for the proposed Turner North, Turner South, and Cypress Run South developments located in Isle of Wight County, Virginia. The proposed developments include commercial, residential, and warehouse-space and are located on the west side of Benns Church Boulevard (U.S. Route 258/State Route 10) between Cypress Run Drive and Red Oak Drive, as illustrated in **Figure 1**. Throughout the report, intersection numbers as they correlate to the figures will be listed after intersections as *(Int. #0)*. The Turner North and Turner South sites include a total of 14 parcels. The Cypress Run South site includes single-family attached and single-family detached housing. It is anticipated that the construction of the proposed developments will be completed in the following phases:

- Interim Year (2025)
  - Turner North – Parcels 2 and 5
  - Turner South – Parcels 6 and 13
- Opening Year (2029)
  - Full Build-Out of Turner North
  - Full Build-Out of Turner South
  - Full Build-Out of Cypress Run South

The conceptual site plan for the proposed developments is included in **Appendix A.**

The purpose of this TIA is to examine existing and future traffic conditions within the agreed upon project study area and identify traffic impacts resulting from the proposed developments on the surrounding road network. Necessary roadway improvements will be identified as part of this TIA based on traffic impacts resulting from the proposed developments

3.0 PROJECT BACKGROUND

3.1 RELEVANT STUDIES

The *Wawa Convenience Market Development Traffic Impact Analysis* in Isle of Wight County, Virginia has been completed. The proposed Wawa site is parcel 6 within the Turner South development. The Wawa TIA includes the intersections of Benns Church Boulevard at Turner Drive *(Int. #3)* and Benns Church Boulevard at Cypress Run Drive *(Int. #1)*. The turning movement counts and COVID adjustments from the Wawa TIA were used in this study for the intersection of Benns Church Boulevard at Cypress Run Drive.

Additionally, background development traffic from the following traffic studies were used in this analysis:

- *Town of Smithfield Intersection Improvements Analysis* (February 2019)
- *Yeoman's Tract Traffic Impact Study (Sweetgrass)* (On-going)

3.2 STUDY ASSUMPTIONS AND METHODOLOGY

This study consists of conducting an analysis of existing traffic conditions and future conditions to determine the impact of the traffic generated on the adjacent roadways. The methodology used for this study is consistent with the Institute of Transportation Engineers (ITE) recommendations for conducting a traffic impact analysis (TIA) and the requirements of the Isle of Wight County and the Town of Smithfield.

A study work group (SWG) was formed for this study to obtain input from major stakeholders, obtain concurrence on analysis methodologies and assumptions, and shape the development of the roadway improvement concepts. The SWG included members representing the following organizations:

- Virginia Department of Transportation (VDOT)
- Isle of Wight County
- Town of Smithfield
- Harrison and Lear, Inc.
- Greenwood Homes
- Kimley-Horn and Associates

An assumptions document detailing the study area, data collection, trip generation, and analysis methodology used for this TIA was submitted to the SWG for review and concurrence. The approved assumptions document is included in **Appendix B**.

3.3 STUDY AREA

The study area for this analysis is shown in **Figure 1** and traffic operations were analyzed at the following existing intersections:

13. Benns Church Boulevard (U.S. Route 258/State Route 10) at Cypress Run Drive (Signalized)
14. Benns Church Boulevard at Tractor Supply Entrance (Unsignalized – Right-In/Right-Out)
15. Benns Church Boulevard at Turner Drive (State Route 644) (Signalized)
16. Benns Church Boulevard at Red Oak Drive (Unsignalized – Full Movement)

Additionally, the following eight (8) site driveways were analyzed under the future Build scenarios:

17. Benns Church Boulevard at Site Driveway #1
18. Benns Church Boulevard at Site Driveway #2
19. Benns Church Boulevard at Site Driveway #3
20. Tractor Supply Entrance at Site Driveway #4
21. Turner Drive at Site Driveway #5
22. Tractor Supply Entrance at Site Driveway #6
23. Site Driveway #3 at Site Driveway #5
24. Benns Church Boulevard at Site Driveway #7



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STUDY AREA

FIGURE 1

3.4 EXISTING CONDITIONS

Figure 2 depicts existing lane designations throughout the study area. Benns Church Boulevard is a four-lane, divided minor arterial within the limits of the study area. Based on VDOT historic counts reported for 2021, the segment of Benns Church Boulevard within the study area carries volumes ranging from 22,000 vehicles per day (VPD) to 24,000 VPD. Benns Church Boulevard is oriented in the north-west/south-east direction with a posted speed limit of 45 miles per hour (MPH). For the purposes of this study, Benns Church Boulevard will be referred to as northbound/southbound. Turner Drive is a two-lane major collector roadway with a posted speed limit of 40 MPH that carries 3,000 VPD based on VDOT historic counts reported for 2021.

3.5 EXISTING TRAFFIC VOLUMES

Traffic counts collected in August 2021 as part of the Wawa TIA at the intersections of Benns Church Boulevard at Cypress Run Drive *(Int. #1)* and Benns Church Boulevard at Turner Drive *(Int. #3)* were used in this analysis. New traffic counts were also collected at the Benns Church Boulevard and Turner Drive *(Int. #3)* intersection on Wednesday, December 14, 2022, a typical weekday with school in session. The new traffic count data included seven hour turning movement count (TMC) data at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* from 6 AM – 9 AM and 2 PM – 6 PM. The traffic volumes from 2021 were also adjusted for COVID-19 impacts. This was done by comparing the TMC data collected in August of 2021 to TMC data that was collected in August of 2017. The 2021 TMC data was grown and combined with new December 2022 count data (which accounts for influence of school related traffic/turning movements) to develop the adjusted 2022 traffic volumes.

Bus data was provided by the Isle of Wight County Schools and reviewed to ensure bus traffic is accurately captured along Turner Drive. Heavy vehicle percentages collected as part of the December 2022 count data were adjusted to account for additional bus traffic to ensure the school arrival and dismissal periods were accurately captured. Traffic counts collected in June 2022 at the intersection of Benns Church Boulevard and Red Oak Drive *(Int. #4)* were also used in this analysis. Traffic volumes at the Benns Church Boulevard and Tractor Supply Entrance *(Int. #2)* were determined using the calculated trip generation based on the ITE Trip Generation, 10th Edition (2017) Manual.

The following uniform morning (AM), and afternoon (PM) peak hours were used in this analysis based on a review of the 2022 count data and input from the SWG.

- AM Peak Hour: 7:00 AM to 8:00 AM
- PM Peak Hour: 4:15 PM to 5:15 PM

Additionally, a supplemental PM peak hour analysis scenario was included to account for school traffic dismissal traffic. This supplemental PM peak hour analysis included traffic data between 2:45 PM and 3:45 PM and only included the 2025 Build PM peak hour scenario. The purpose of this supplemental analysis is to confirm the proposed improvements can adequately serve peak school dismissal traffic in the 2025 Build scenario. Based on discussions with the SWG, the supplemental analysis only included the key intersections adjacent to the schools that carry significant amounts of school traffic during school dismissal. The supplemental analysis is discussed further in Section 5.4.

The 2022 existing peak hour analysis volumes are provided in **Figure 3**. Heavy vehicle percentages were calculated for each individual intersection movement, while overall intersection peak hour factors (PHF) were calculated and then applied to each intersection movement. This methodology is consistent with the approved assumptions document included in **Appendix B**.

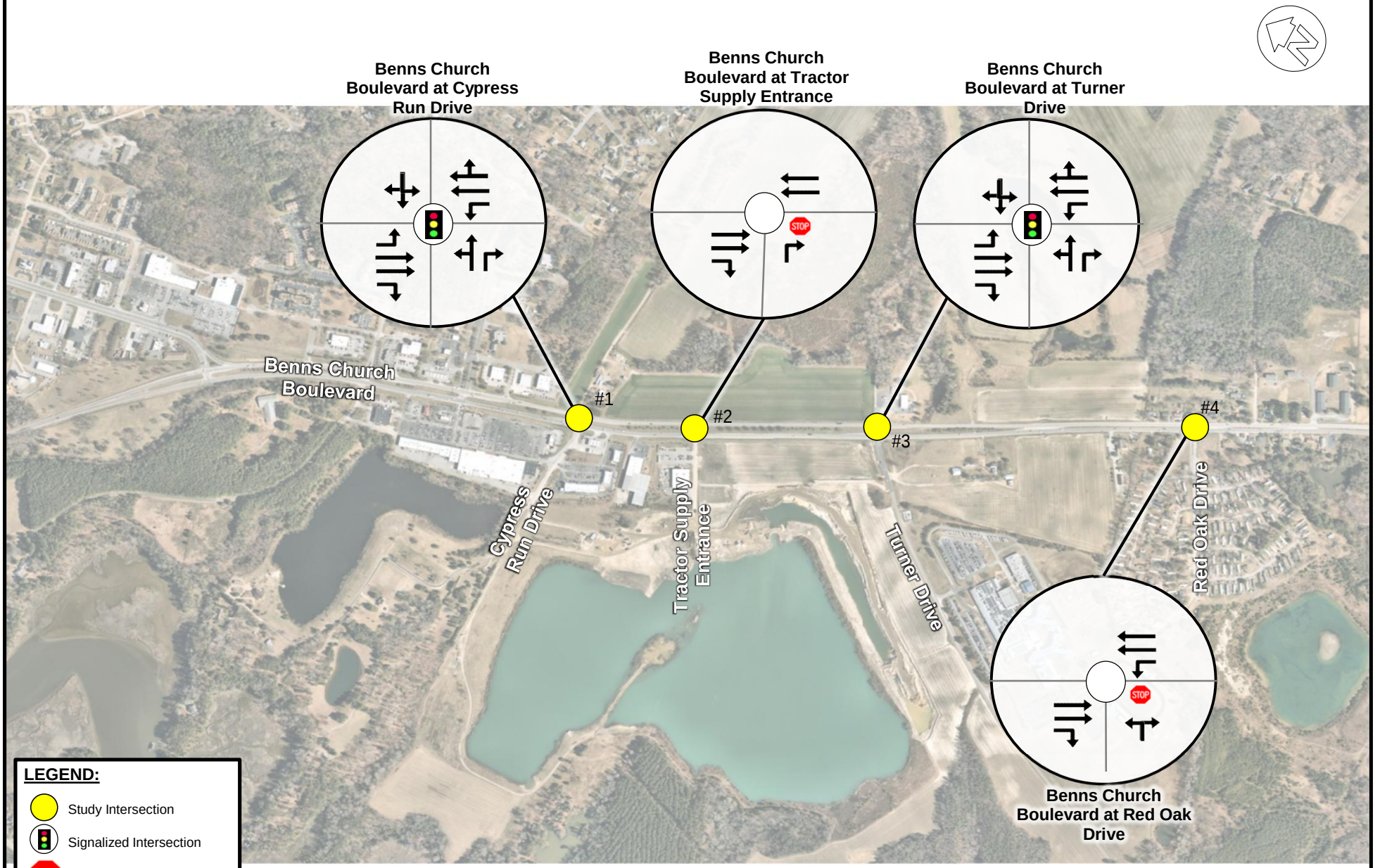
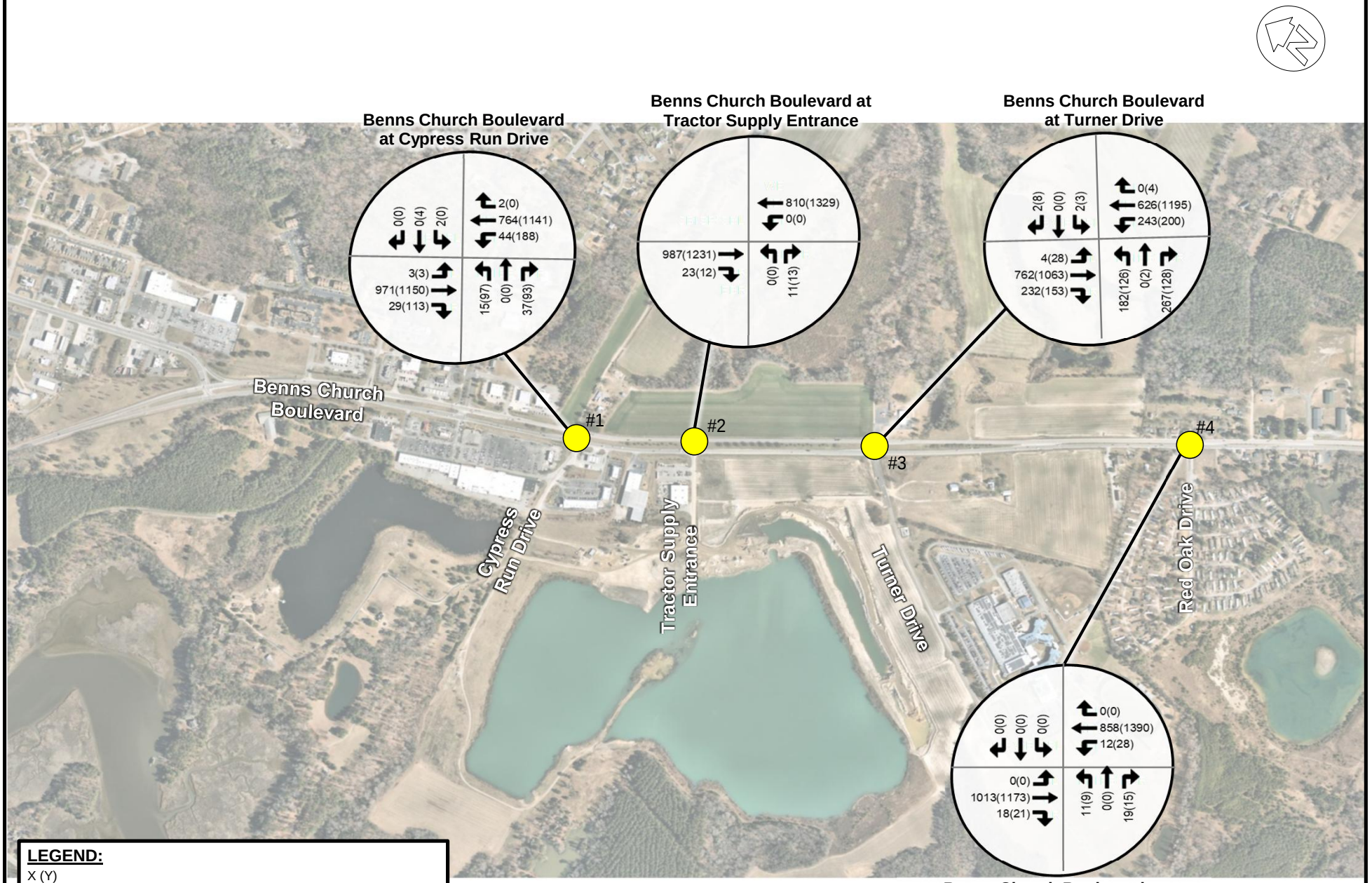


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EXISTING GEOMETRIC CONDITIONS

FIGURE 2



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2022 AM AND PM PEAK HOUR VOLUMES

FIGURE 3

4.0 FUTURE TRAFFIC VOLUME DEVELOPMENT

This study includes the analysis of the Existing, No Build, and Build Conditions during the AM and PM peak hours. The proposed Turner South, Turner North, and Cypress Run South developments are anticipated to be completed in 2029. A summary of general traffic conditions associated with each of the scenarios is described below:

- **2022 Existing –** Existing traffic volumes and conditions.
- **2025 Interim Year No-Build –** Interim year traffic conditions with a future growth rate applied to the existing volumes.
- **2025 Interim Year Build –** Interim year traffic conditions with a future growth rate applied to the existing volumes plus traffic volumes generated by the background development traffic plus traffic volumes generated by the proposed sites anticipated to be developed in 2025. This scenario also includes the proposed public roads and proposed roadway improvements included in the 2025 Interim Year scenario.
- **2029 Future Year Build –** Build-out year traffic conditions with a future growth rate applied to the existing volumes plus traffic volumes generated by the background development traffic plus traffic volumes generated by the proposed site anticipated to be developed in 2029. This scenario also includes the proposed public roads and proposed roadway improvements included in the 2025 Interim Year scenario. This scenario also includes the proposed public roads and proposed roadway improvements included in the 2029 Future Year scenario.
- **2045 Horizon Year Build –** Build-out year traffic conditions with a future growth rate applied to the existing volumes plus traffic volumes generated by the background development traffic plus traffic volumes generated by the proposed site anticipated to be developed in 2045. This scenario also includes the proposed public roads and proposed roadway improvements included in the 2045 Horizon Year scenario.

Future growth rates and site traffic were applied to the existing traffic to determine the future volumes as described in the following sections.

4.1 BACKGROUND TRAFFIC GROWTH AND DIVERSIONS

In coordination with VDOT, Isle of Wight County, and the Town of Smithfield, a growth rate of 1.0% was used to account for growth potential in the surrounding area.

This growth rate was determined by reviewing the County average growth rate from VDOT with input from the SWG. Therefore, future background peak hour traffic volumes were developed by applying the 1.0% growth rate to the existing volumes. This methodology is consistent with the approved assumptions document included in **Appendix B**.

In addition to background traffic growth, it is assumed that school background traffic patterns will change once the proposed public roads are constructed. Based on discussions with the SWG, some of the existing traffic traveling to/from Smithfield High School is expected to travel along the proposed public roadways before accessing Turner Drive or Benns Church Boulevard. School traffic accessing the northern parking lot serving Smithfield High School is assumed to divert from Benns Church Boulevard or Turner Drive onto the proposed public roads. It is assumed 25% of the school traffic enters/exits the parking lot outside the peak hours and is not reflected in the peak hour volume diversions. The school background traffic diversions are captured in the future peak hour build analysis scenarios and are summarized in Section 4.4

4.2 BACKGROUND DEVELOPMENT TRAFFIC

Other approved developments in the vicinity of the study area were included in the future traffic volumes as background traffic. VDOT and Isle of Wight County identified the following background developments to be included in the future volume determination:

- Smithfield Development
  - The Smithfield Development includes Cypress Run Developments (North), and Benns Church Retail (North). These developments include residential, and retail/commercial land uses. Trip generation associated with these developments is expected to result in an additional 8,850 daily trips in 2045.
- Smithfield Intermediate School Traffic
  - Smithfield Intermediate School is a school that is expected to have 400 students and will be located south of the existing Smithfield Middle School on Turner Dr. Trip generation associated with the new intermediate school is expected to result in an additional 776 daily weekday trips.
- Sweetgrass
  - Sweetgrass is a mixed-use development that includes single family residential, multi-family residential, and retail commercial land uses. This undeveloped parcel is located at 14096 Benns Church Blvd. The parcel is on the northeast side of Benns Church Blvd between US 258/Rt 32 (Brewers Neck Blvd) and Canteberry Lane. This development is anticipated to result in 7,285 daily new trips and is expected to be in full operation in 2029.

Trip generation, distribution, and assignment for these background developments is consistent with the *Town of Smithfield Intersection Improvement Alternatives Analysis* and the *Yeoman's Tract Traffic Impact Study (Sweetgrass)*. The location, land uses, and intensities for the sites included in the background developments are summarized in the assumptions document in **Appendix B**.

4.3 PROPOSED TRIP GENERATION

Traffic generation potential for the proposed development was obtained using *ITE Trip Generation 10th Edition* (2017). Trip generation estimates were developed based on the proposed conceptual site plan (included in **Appendix A**). The proposed developments will consist primarily of commercial and residential land uses. Trip generation calculations for the Turner North, Turner South, and Cypress Run South sites are shown in **Table 3** through **Table 5**.

Table 3: Trip Generation for Proposed Turner North Developments

Parcel ID	ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
						Total	In	Out	Total	In	Out
NORTH											
1	934	Fast Food Restaurant with Drive-Through Window	5,000	SF	2,355	201	103	98	163	85	78
2	948	Automated Car Wash	3,000	SF	430	32	17	15	43	22	22
3	932	High-Turnover (Sit-Down) Restaurant	3,000	SF	337	30	17	13	29	18	11
4	932	High-Turnover (Sit-Down) Restaurant	3,000	SF	337	30	17	13	29	18	11
5	912	Drive-In Bank	4	Lanes	499	35	21	14	109	53	56
New External Site Trips					*3,958*	*328*	*175*	*153*	*373*	*196*	*178*
Parcel 1: Code 934 Pass-by (0% AM, 49% PM)					*0*	*(97)*	*(49)*	*(47)*	*(81)*	*(42)*	*(38)*
Parcel 2: Code 948 Pass-by (0% AM, 0% PM)					*0*	*0*	*0*	*0*	*0*	*0*	*0*
Parcel 3: Code 932 Pass-by (0% AM, 43% PM)					*0*	*0*	*0*	*0*	*(11)*	*(7)*	*(4)*
Parcel 4: Code 932 Pass-by (0% AM, 43% PM)					*0*	*0*	*0*	*0*	*(11)*	*(7)*	*(4)*
Parcel 5: Code 912 Pass-by (29% AM, 35% PM)					*0*	*(9)*	*(5)*	*(3)*	*(37)*	*(18)*	*(19)*
New Driveway Trips					3,958	221	120	103	232	123	113

Source: ITE Trip Generation Manual, 10th Edition, (2017)
Pass-by percentages using ITE Trip Generation Handbook, 3rd Edition (2017)

Table 4: Trip Generation for Proposed Turner South Developments

Parcel ID	ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
						Total	In	Out	Total	In	Out
6	960	Super Convenience Market/Gas Station	Average		4,378	508	254	254	393	197	196
7	934	Fast Food Restaurant with Drive-Through Window	3,000	SF	1,413	121	62	59	98	51	47
8	848	Tire Store	7,680	SF	219	21	13	8	31	13	18
9	934	Fast Food Restaurant with Drive-Through Window	3,235	SF	1,524	130	66	64	106	55	51
10	934	Fast Food Restaurant with Drive-Through Window	3,000	SF	1,413	121	62	59	98	51	47
11	822	Strip Retail Plaza (Less than 40,000 SF)*	28,000	SF	1,411	66	40	26	162	81	81
12	720	Medical-Dental Office Building	21,500	SF	738	57	44	13	75	21	54
13	151	Mini-Warehouse	108,000	SF	163	11	7	4	18	8	10
14	822	Strip Retail Plaza (Less than 40,000 SF)*	28,000	SF	1,411	66	40	26	162	81	81
New Site Trips					12,670	1,035	548	487	981	477	504
Internal Capture (10%)					*(813)*	*(58)*	*(33)*	*(26)*	*(73)*	*(35)*	*(38)*
New External Site Trips					*11,857*	*976*	*515*	*461*	*908*	*442*	466
Parcel 6: Code 960 Pass-by (62% AM, 56% PM)					*0*	*(320)*	*(160)*	*(160)*	*(259)*	*(130)*	*(129)*
Parcel 7: Code 934 Pass-By (49% AM, 50% PM)					*0*	*(59)*	*(30)*	*(29)*	*(49)*	*(26)*	*(24)*
Parcel 8: Code 848 Pass-By (28% PM)					*0*	*0*	*0*	*0*	*(9)*	*(4)*	*(5)*
Parcel 9: Code 934 Pass-By (49% AM, 50% PM)					*0*	*(64)*	*(31)*	*(31)*	*(53)*	*(28)*	*(26)*
Parcel 10: Code 934 Pass-By (49% AM, 50% PM)					*0*	*(59)*	*(30)*	*(29)*	*(49)*	*(26)*	*(24)*
Parcel 11: Code 822 Pass-By (40% PM)					*0*	*0*	*0*	*0*	*(65)*	*(32)*	*(33)*
Parcel 14: Code 822 Pass-By (40% PM)					*0*	*0*	*0*	*0*	*(65)*	*(32)*	*(33)*
New Driveway Trips					11,857	474	263	212	359	165	192

Source: ITE Trip Generation Manual, 10th Edition, (2017)
Pass-by percentages using ITE Trip Generation Handbook, 3rd Edition (2017)
**Strip Retail Plaza trips estimated using the ITE Trip Generation Manual, 11th Edition, (2021)*
The trip generation for parcel 6 was obtained by averaging the trips generated using square footage and vehicle fueling positions.

Table 5: Trip Generation for the Proposed Cypress Run South Development

ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
210	Single-Family Detached	154	DU	1,501	110	29	81	149	94	55
215	Single-Family Attached	108	DU	772	50	16	34	61	35	26
New Driveway Trips				2,273	160	45	115	210	129	81

As shown in **Table 3** through **Table 5**, the proposed Turner North, Turner South, and Cypress Run South development sites have the potential to generate a total of 3,958, 11,857, and 2,273 new daily trips, respectively.

4.4 TRIP DISTRIBUTION AND ASSIGNMENT

Global trip distributions for this analysis were consistent with the *Wawa Convenience Market Development Traffic Impact Analysis*. Therefore, the following global traffic distributions were used for the Turner North, Turner South, and Cypress Run South traffic assignment onto the roadway network:

- 20% to/from the west on Turner Drive
- 40% to/from the north on Benns Church Boulevard
- 40% to/from the south on Benns Church Boulevard

However, unique trip assignment percentages were developed for these developments across study intersections. The trip assignments for the Turner South, Turner North, and Cypress Run South developments were determined based on anticipated routes for vehicles entering and existing the proposed sites, and a general familiarity of the study area.

Peak hour trip assignments were developed by multiplying the proposed new trips by the agreed-to trip distributions. The Turner North, Turner South, and Cypress Run South trip assignments and the background development trips were added to the future background volumes to develop the future Build traffic volumes. The background site traffic distributions are consistent with the *Town of Smithfield Intersection Improvement Alternatives Analysis* and the *Yeoman's Tract Traffic Impact Study (Sweetgrass)*.

The future No-Build and Build analysis traffic volumes are illustrated in **Figure 4** through **Figure 7**.

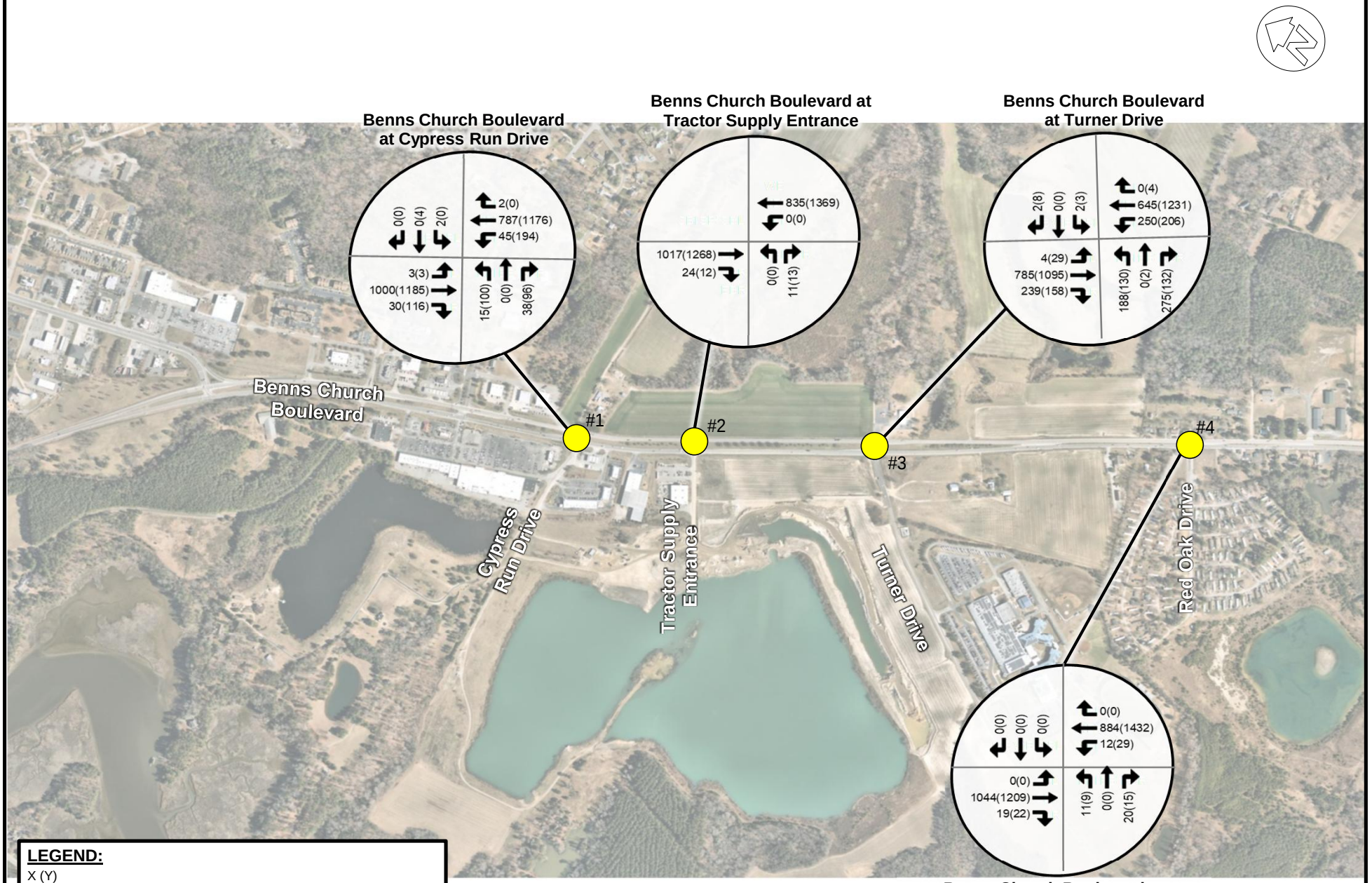
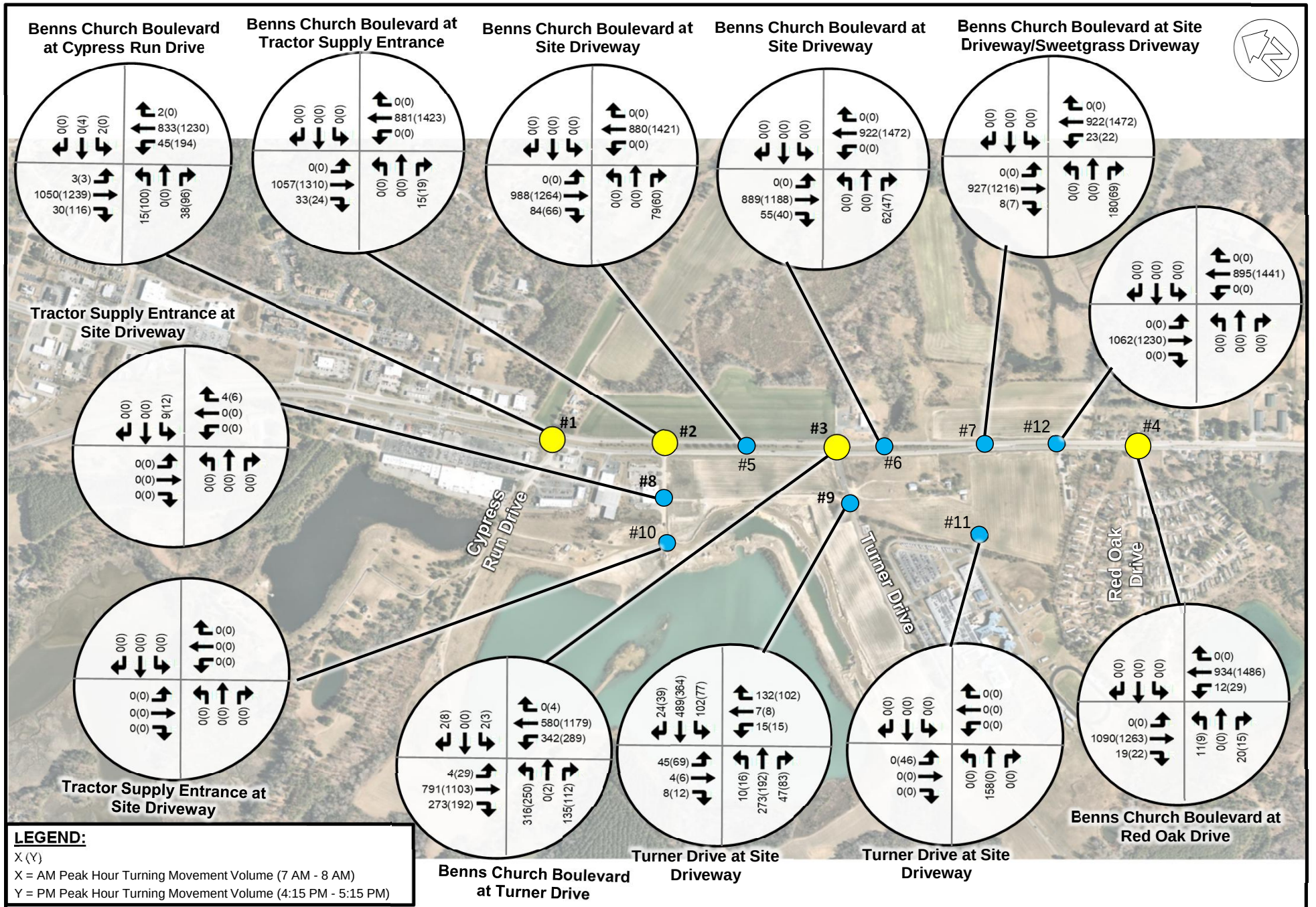


Image Provided by Nearmap

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2025 NO BUILD AM AND PM PEAK HOUR VOLUMES

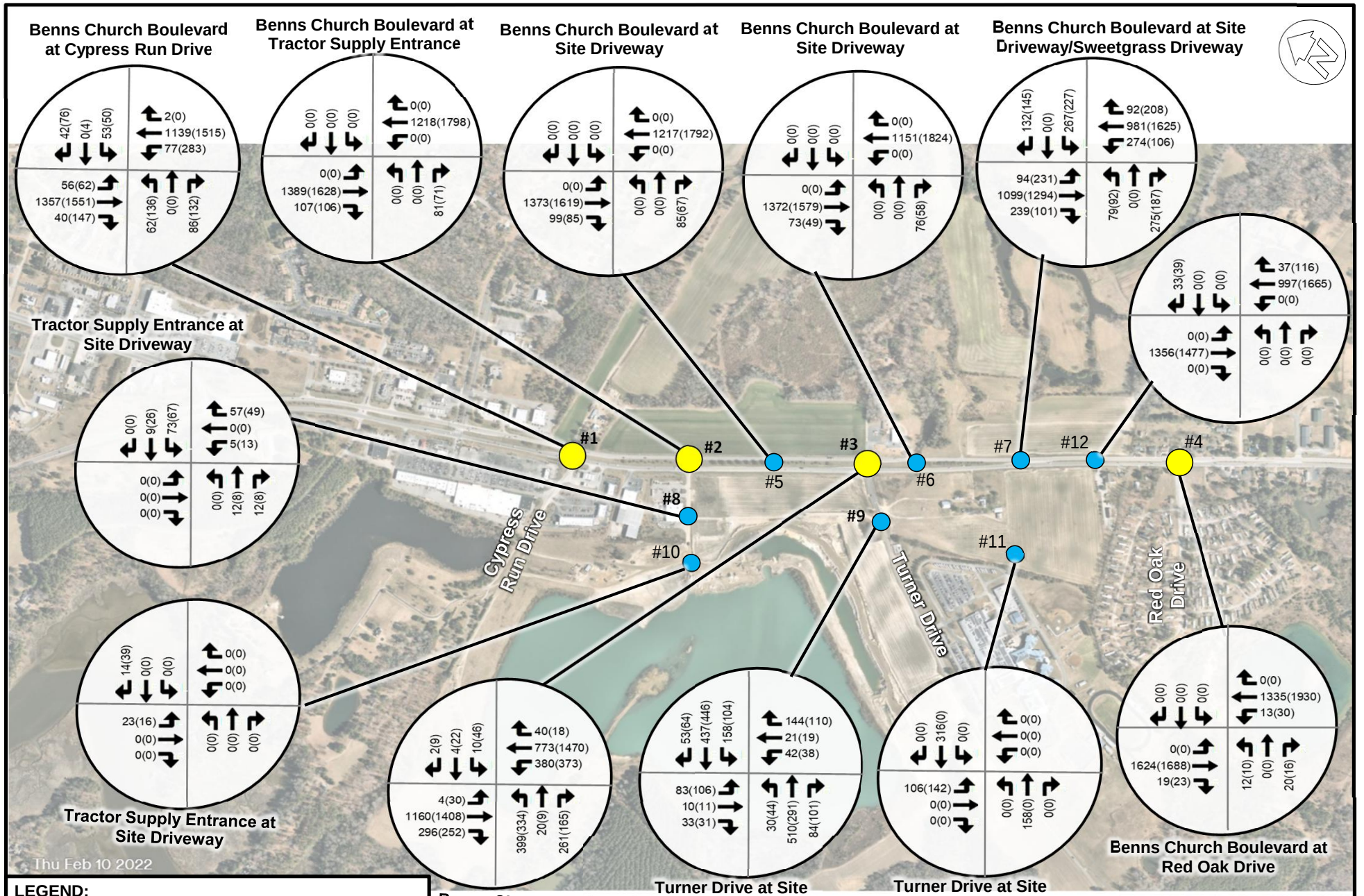
FIGURE 4



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2025 BUILD AM AND PM PEAK HOUR VOLUMES

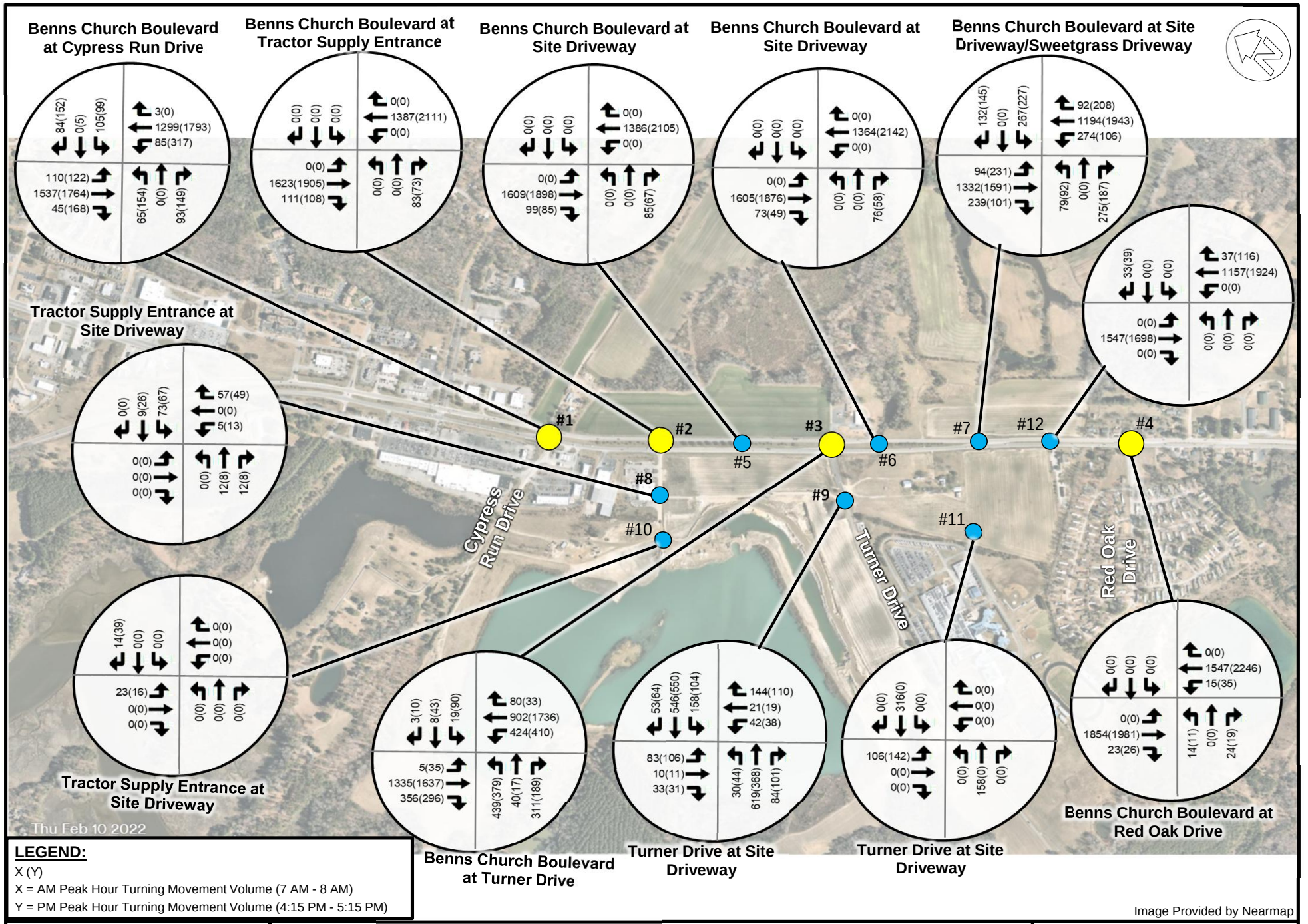
FIGURE 5



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2029 BUILD AM AND PM PEAK HOUR VOLUMES

FIGURE 6



LEGEND:

X (Y)

X = AM Peak Hour Turning Movement Volume (7 AM - 8 AM)

Y = PM Peak Hour Turning Movement Volume (4:15 PM - 5:15 PM)

Image Provided by Nearmap

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2045 BUILD AM AND PM PEAK HOUR VOLUMES

FIGURE 7

5.0 TRAFFIC ANALYSIS

Capacity analyses for all study intersections were performed under the peak hour conditions for the following scenarios:

- Scenario 1 – Existing (2022) traffic conditions
- Scenario 2 – Interim Year (2025) No-Build – Interim year traffic conditions (i.e., future traffic volumes *with* a 1.0% growth rate applied *without* projected site traffic) with existing roadway conditions.
- Scenario 3 – Interim Year (2025) Build – Interim year traffic conditions (i.e., future traffic volumes *with* a 1.0% growth rate applied *with* projected site traffic) with proposed roadway improvements. The projected site traffic includes the following proposed developments:
    - Turner North – Parcels 2 and 5
    - Turner South – Parcels 6 and 13
- Scenario 4 – Future Year (2029) Build – Future year traffic conditions (i.e., future traffic volumes *with* a 1.0% growth rate applied *with* projected site traffic) with proposed roadway improvements. The projected site traffic includes the following proposed developments:
    - Turner North – Full Build-Out
    - Turner South – Full Build-Out
    - 50% of Smithfield Development
    - Smithfield Intermediate School
    - Sweetgrass – Full Build-Out
- Scenario 5 – Horizon Year (2045) Build – Horizon year traffic conditions (i.e., future traffic volumes *with* a 1.0% growth rate applied *with* projected site traffic) with proposed roadway improvements. The projected site traffic includes the following proposed developments:
    - Turner North – Full Build-Out
    - Turner South – Full Build-Out
    - Smithfield Development – Full Build-Out
    - Smithfield Intermediate School
    - Sweetgrass – Full Build-Out

Table 6: Summary of Analysis Scenarios

Scenario	Developments Included	Roadway Conditions	Traffic Volumes
Scenario 1: Existing Conditions (2022)	No Developments Included	Existing Conditions Figure 2	2022 Existing Figure 3
Scenario 2: Interim Year (2025) No-Build Conditions	No Developments Included	Existing Conditions Figure 2	Existing Volumes **+** **3 Years of Background Growth (1.0% Annually)** Figure 4
Scenario 3: Interim Year (2025) Build Conditions	**Turner North – Parcels 2 and 5** **Turner South – Parcels 6 and 13**	No Build Conditions **+** **Site Driveways** **Full Build-Out of all Public Roads** **Smithfield High School Roadway Connection with right-in/right-out/left-in configuration at Intersection #7** Figure 8	2025 Background Volumes **+** **Proposed Development Trips** Figure 5
Scenario 4: Future Year (2029) Build Conditions	**Turner North – Full Build-Out** **Turner South – Full Build-Out** **Cypress Run South** **50% of Smithfield Development** **Smithfield Intermediate School** **Sweetgrass – Full Build-Out**	Interim Year (2025) Build Conditions + **Signalized Intersection at Intersection #7 (By Others)** Figure 9	Existing Volumes **+** **7 Years of Background Growth (1.0% Annually)** **Proposed Development Trips** Figure 6
Scenario 5: Horizon Year (2045) Build Conditions	**Turner North – Full Build-Out** **Turner South – Full Build-Out** **Smithfield Development – Full Build-Out** **Smithfield Intermediate School** **Sweetgrass – Full Build-Out**	Future Year (2029) Build Conditions Figure 10	Existing Volumes**+** **23 Years of Background Growth (1.0% Annually)** **Proposed Development Trips** Figure 7

5.1 TURN LANE WARRANT ANALYSIS

The need for new/extended turn lanes were considered for the key turning movements at the study intersections under the 2025, 2029, and 2045 analysis scenarios.

The turn-lane warrants were conducted in accordance with the VDOT turn-lane warrant analysis guidelines per *Appendix F Access Management Design Standards for Entrances and Intersections*. Based on the turn lane warrant analysis, the following turn lanes along Benns Church Boulevard are warranted and recommended under the future analysis scenarios:

5.1.1 2025 Interim Year

- Exclusive southbound right-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #1 *(Int. #5)*
- Exclusive southbound right-turn lane with a storage length of 100 feet and a 100-foot taper at the intersection of Benns Church Boulevard and Site Driveway #2 *(Int. #6)*
- Extend the existing exclusive northbound left-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7).* It should be noted that an increase in storage length for this movements is warranted and recommended in 2029. It is recommended that the full turn lane with a storage length of 200 feet and a 200-foot taper be constructed in 2025 when the connection to Benns Church Boulevard is made.

5.1.2 2029 Future Year

- Exclusive southbound right-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Tractor Supply Entrance *(Int. #2)*
- Exclusive northbound left-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
- Exclusive northbound right-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
- Exclusive southbound left-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
- Exclusive southbound right-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*

5.2 SIGNAL WARRANT ANALYSIS

A traffic signal warrant analysis was conducted at the intersection of Benns Church Boulevard at Site Driveway #3/Sweetgrass Driveway *(Int. #7)*. The traffic signal warrant evaluations were conducted using methodologies set forth in the *Manual on Uniform Traffic Control Devices, 2009 Edition (MUTCD)*. The *MUTCD* describes nine warrants for providing guidance on the justification of traffic signal consideration.

Warrant 3 (Peak Hour Vehicular Volume) was the only warrant analysis included in this study due to the availability of traffic data. The warrant analysis considered the peak hours (i.e., 7:00 AM to 8:00 AM and 4:15 to 5:15 PM). **Table 7** summarizes the results from the traffic signal warrant analysis for the 2029 Build peak hour scenarios.

Table 7: Traffic Signal Warrant Results Summary

Benns Church Boulevard at Site Driveway #3/Sweetgrass Driveway *(Int. #7)*	
Scenario	**Peak Hour**
2029 Build AM Peak Hour	✓
2029 Build PM Peak Hour	✓

Based on the warrant analysis and anticipated safety improvements associated with installing a traffic signal at the intersection of Benns Church Boulevard and Site Driveway #3/Sweetgrass Driveway *(Int. #7)*, a traffic signal is recommended under the 2029 Build conditions.

5.3 BUILD INTERSECTION IMPROVEMENTS

5.3.1 Improvements By-Others

The following intersection and roadway improvements are approved or expected as part of the background developments:

- Extending the existing northbound left-turn lane at the Turner Drive and Benns Church Boulevard intersection *(Int. #3)*. The turn lane will be extended to have a total storage length of 250 feet and a 150-foot taper. This improvement is part of a funded SMART SCALE project and is expected to be constructed by 2029 and is included in the Future Year 2029 analysis scenarios.
- Installing a traffic signal at the intersection of Benns Church Boulevard and Site Driveway #3/Sweetgrass Driveway *(Int. #7)*. This improvement is expected to be implemented by the developer by 2029 and is included in the Future Year 2029 analysis scenarios.

5.3.2 Proposed Improvements

Based on the turn-lane warrant analysis, signal warrant analysis, operational screening analysis, and conversations with the SWG, the following roadway improvements are recommended to accommodate the future developments (also summarized in **Figure 8** through **Figure 10**):

5.3.2.1 Interim Year (2025) Recommendations

- Turn lane improvements as described below:
  - Exclusive southbound right-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #1 *(Int. #5)*
  - Exclusive southbound right-turn lane with a storage length of 100 feet and a 100-foot taper at the intersection of Benns Church Boulevard and Site Driveway #2 *(Int. #6)*
  - Extend the existing exclusive northbound left-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7).* It should be noted that an increase in storage length for this movements is warranted and recommended in 2029. It is recommended that the full turn lane with a storage length of 200 feet and a 200-foot taper be constructed in 2025 when the connection to Benns Church Boulevard is made.
- Single-Lane Roundabout at the intersection of Turner Drive and Site Driveway #5 *(Int. #9)*
- Modify eastbound approach geometry at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to include the following laneage:
  - Exclusive left-turn lane
  - Shared through-left turn lane
  - Exclusive right-turn lane with a storage length of 250 feet and a 115-foot taper

5.3.2.2 Future Year (2029) Recommendations

In addition to the recommendations included in the 2025 analysis scenarios, the following recommendations are included in the 2029 analysis scenarios:

- Turn lane improvements as described below:
  - Exclusive southbound right-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Tractor Supply Entrance *(Int. #2)*

  - Exclusive northbound left-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive northbound right-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive southbound left-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive southbound right-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
- Install a traffic signal at the intersection of Benns Church Boulevard and Site Driveway #3/Sweetgrass Driveway *(Int. #7).* This traffic signal will be completed as part of the Sweetgrass development.
- Provide an additional exclusive northbound left-turn lane at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to provide a dual-left turn movement

5.3.2.3 Horizon Year (2045) Recommendations

In addition to the recommendations included in the 2029 analysis scenarios and the proposed turn lane improvements, the following recommendations are included in the 2045 analysis scenarios:

- Widen Benns Church Boulevard to a six-lane roadway (three lanes in each direction) within the study area
- Modify the westbound approach geometry at the intersection of Benns Church Boulevard and Cypress Run Drive *(Int. #1)* to include the following laneage:
  - Exclusive left-turn lane
  - Shared through-left turn lane
  - Exclusive right-turn lane with a storage length of 100 feet and a 100-foot taper
- Modify the westbound approach geometry at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to include the following laneage:
  - Exclusive left-turn lane
  - Shared through-left turn lane
  - Exclusive right-turn lane with a storage length of 100 feet and a 100-foot taper

5.4 INTERSECTION OPERATIONAL ANALYSIS

All signalized and unsignalized intersection capacity analyses were completed using *Synchro Professional (Version 11.1)* and *SimTraffic*, which is the microsimulation companion tool of *Synchro*. Existing traffic signal timings were provided by VDOT. The cycle lengths were kept consistent, and the splits were adjusted in the future conditions analyses.

Two (2) measures of effectiveness (MOE) were analyzed in the intersection capacity analyses – average vehicle delay (in seconds per vehicle) and maximum queue lengths (in feet, rounded up to the nearest 5 feet). Average vehicle delays were obtained using *2000 Highway Capacity Manual (HCM)* methodologies contained within *Synchro*. Maximum queue lengths were obtained by averaging results from 10 individual *SimTraffic* simulation runs. Accompanying HCM vehicle delays are HCM level of service (LOS) designations. LOS ranges from A to F— "A" indicating a condition of little or no congestion and "F" a condition with severe congestion, unstable traffic flow, and stop-and-go conditions. **Table 8** summarizes LOS thresholds by vehicle delay for signalized and unsignalized intersections.

Throughout this section, average vehicle delay and LOS results are presented in tables, while software output results are included in **Appendix C** for the critical study area intersections. The queueing results summary tables are included in **Appendix D**. As part of the queuing analysis, instances where queues extend back and may block or impact adjacent turn- and/or through lanes were noted. Lastly, queue lengths were rounded up to the nearest 5 feet and were summarized in the queue summary tables. Detailed LOS tables are included in **Table 9** through **Table 16**.

Table 8: Level of Service (LOS) Control Delay Thresholds

LOS	Signalized Intersections Control Delay Per Vehicle [sec/veh]	Unsignalized Intersections Average Control Delay [sec/veh]	Relative Delay
A	≤ 10	≤ 10	Short Delays
	Free-flow traffic operations at average travel speeds. Vehicles completely unimpeded in ability to maneuver. Minimal delay at signalized intersections.		
B	> 10 – 20	> 10 – 15	
	Reasonably unimpeded traffic operations at average travel speeds. Vehicle maneuverability slightly restricted. Low traffic delays.		
C	> 20 – 35	> 15 – 25	
	Stable traffic operations. Lane changes becoming more restricted. Travel speeds reduced to half of average free flow travel speeds. Longer intersection delays.		
D	>35 – 55	> 25 – 35	Moderate Delays
	Small increases in traffic flow can cause increased delays. Delays likely attributable to increase traffic, reduced signal progression and adverse timing.		
E	>55 – 80	> 35 – 50	
	Significant delays. Travel speeds reduced to one third of average free flow travel speed.		
F	> 80	> 50	Long Delays
	Extremely low speeds. Intersection congestion. Long delays. Extensive traffic queues at intersections.		

As discussed in Section 3.5, a supplemental 2025 PM Build analysis was completed as part of this TIA to confirm no fatal flaws under the 2025 scenario related to school dismissal traffic. The Supplemental 2025 PM Build Analysis Outputs are included in **Appendix E**.

5.4.1 Existing Analysis Results

The Existing AM and PM peak hour LOS/delay is summarized in **Table 9**. Under existing conditions, most of the movements/approaches operate at LOS D or better. The mainline through movements of Benns Church Boulevard operate with moderate delays at LOS C or better. However, the following movements/approaches operate with more significant delays/queues:

- Eastbound and westbound approaches at Benns Church Boulevard and Cypress Run Drive *(Int. #1)*
    - The eastbound and westbound approaches operates at LOS E under the Existing AM and PM peak hours. The eastbound/westbound approaches operate in “split-phase” (i.e., movements do not run concurrently) and the existing signal timing priority is given to Benns Church Boulevard. The westbound approach operates with low traffic volumes (i.e., less than 5 vehicles per hour) during the peak hours and the eastbound approach

operates with nearly 200 vehicles per hour under the Existing PM peak hour. The minor street delays do not significantly contribute to the overall operations of this intersection.

- Eastbound left-turn movement at Benns Church Boulevard and Turner Drive *(Int. #3)*
  - The eastbound left-turn movement operates at LOS E under the Existing AM and PM peak hours. The eastbound left-turn movement carries over 180 vehicles per hour under the Existing AM peak hour and over 125 vehicles per hour under the Existing PM peak hour. This movement is a relatively high traffic volume movement that is served by a single lane.

Table 9: Existing LOS Summary

ID	Intersection	Traffic Control	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
				Eastbound			Westbound			Northbound			Southbound		
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	B	**E**		**E**	**E**			A	A		A	B	A
				(58.5)		(56.7)				(9.4)	(8.9)		(7.1)	(14.0)	(9.6)
			(13.0)	E			(65.1)			A			B		
				(57.2)						(8.9)			(13.9)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		A	-			-	A	-	-	A	A
						(9.5)					(0.0)			(0.0)	(0.0)
			(0.1)	A						A			A		
				(9.5)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	C	**E**		D	D			C	B		A	B	D
				(75.3)		(42.8)				(22.9)	(14.6)		(4.0)	(19.4)	(44.8)
			(28.1)	E			(40.0)			B			C		
				(56.0)						(16.9)			(25.3)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	D			-			B	A		A		A
										(10.9)	(0.0)		(0.0)		(0.0)
			(0.5)	(27.3)						A			A		
										(0.1)			(0.0)		
PM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	B	**E**		D	**E**			C	A		B	C	B
				(61.6)		(53.8)				(21.3)	(5.9)		(13.6)	(24.3)	(15.7)
			(18.6)	E			(68.6)			A			C		
				(57.8)						(8.1)			(23.5)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		A	-			-	A	-	-	A	A
						(9.5)					(0.0)			(0.0)	(0.0)
			(0.0)	A						A			A		
				(9.5)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	B	**E**		D	D			B	B		C	B	C
				(58.6)		(46.8)				(16.4)	(16.0)		(21.5)	(13.1)	(25.9)
			(18.9)	D			(45.9)			B			B		
				(52.7)						(16.0)			(14.9)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	**E**			-			B	A		A		A
										(12.0)	(0.0)		(0.0)		(0.0)
			(0.5)	(44.3)						A			A		
										(0.2)			(0.0)		

5.4.2 *Future Analysis Results*

The future AM and PM peak hour LOS and delay results are summarized in **Table 10** through **Table 16**. Under the future conditions, the traffic volumes and magnitudes are expected to change significantly. The change in traffic patterns and the proposed roadway geometry results in different delays and queues under the future analysis scenarios when compared to the Existing and No Build peak hour scenarios.

Under No Build conditions, minor changes in traffic volume patterns are expected, and the No Build results are expected to be comparable to the existing conditions. The minor street approaches at the signalized intersections of Benns Church Boulevard at Cypress Run Drive and Benns Church Boulevard at Turner Drive continue to operate at LOS D or LOS E under the No Build conditions. However, all the study intersections operate at an overall LOS C or better under the 2025 No Build peak hour scenarios.

Under the 2025 Build peak hour scenarios, the study intersections operate at an overall LOS D or better. The proposed single-lane roundabout at the intersection of Turner Drive and Site Driveway #5 is able to support the projected traffic volumes without impacting the adjacent study intersections. The increase in traffic volumes along Benns Church Boulevard creates additional delay at the minor street approach for the Red Oak Drive intersection. Under the 2025 Build peak hour scenarios, the eastbound approach at the Benns Church Boulevard and Red Oak Drive intersection operates at LOS F. This approach experiences increased delays under the future Build scenarios, however the traffic volumes on this approach are relatively low and do not adversely impact the overall operations along Benns Church Boulevard. The proposed eastbound turn lane improvements at the intersection of Benns Church Boulevard and Turner Drive result in moderate delays with queues that are not expected to impact the adjacent study intersections. Minor delays and queues are expected at the site driveway intersections under the 2025 Build peak hour scenarios.

Under the 2029 Build peak hour scenarios, moderate congestion is expected with no intersections operating at an overall LOS F. The proposed improvements along Benns Church Boulevard are able to accommodate the projected traffic volumes under the 2029 Build scenarios. The proposed dual northbound left-turn lanes at the Benns Church Boulevard and Turner Drive intersection results in manageable delays with the northbound left-turn movement operating at LOS D under the future peak hour scenarios. Without dual northbound left-turn lanes, this movement is expected to fail and create significant impacts along Benns Church Boulevard.

Under 2045 Build conditions, the traffic volumes are much larger than the No Build volumes. With this increase in traffic volumes, there is a greater need for additional capacity along Benns Church Boulevard. Under the 2045 Build conditions, the widening of Benns Church Boulevard to a six-lane roadway results in moderate delays with no intersections operating at an overall LOS F. Some of the minor street movements and approaches are expected to operate at LOS F due to the increase in traffic along Benns Church Boulevard. However, these additional delays do not adversely impact the overall operations within the study area.

Table 10: 2025 No-Build LOS Summary

ID	Intersection	Traffic Control	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
				Eastbound			Westbound			Northbound			Southbound		
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	B	**E**		**E**		**E**		A	A		A	B	A
				(58.5)		(56.7)				(9.7)	(8.7)		(7.2)	(14.3)	(9.6)
			(13.0)	E				(65.1)		A			B		
				(57.2)						(8.7)			(14.1)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		A		-		-	A	-	-	A	A
						(9.4)					(0.0)			(0.0)	(0.0)
			(0.1)	A						A			A		
				(9.4)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	C	**E**		D		D		B	B		A	B	D
				(72.9)		(42.7)				(19.3)	(14.2)		(2.8)	(17.8)	(44.8)
			(26.9)	D				(40.3)		B			C		
				(55.0)						(15.6)			(24.0)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	D				-		B	A		A		A
										(11.1)	(0.0)		(0.0)		(0.0)
			(0.5)	(28.7)						A			A		
										(0.1)			(0.0)		
PM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	B	**E**		D		**E**		C	A		B	C	B
				(62.5)		(53.8)				(21.6)	(5.9)		(14.2)	(25.5)	(16.1)
			(19.1)	E				(68.6)		A			C		
				(58.3)						(8.1)			(24.6)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		A		-		-	A	-	-	A	A
						(9.6)					(0.0)			(0.0)	(0.0)
			(0.0)	A						A			A		
				(9.6)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	B	**E**		D		D		B	B		C	B	C
				(59.0)		(46.7)				(18.6)	(16.4)		(23.2)	(13.5)	(25.6)
			(19.4)	D				(45.8)		B			B		
				(52.8)						(16.7)			(15.2)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	**E**				-		B	A		A		A
										(12.3)	(0.0)		(0.0)		(0.0)
			(0.6)	(48.9)						A			A		
										(0.2)			(0.0)		

Table 11: 2025 AM Build LOS Summary

ID	Intersection	Traffic Control	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
				Eastbound			Westbound			Northbound			Southbound		
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	B	**E**		**E**	**E**			B	B		A	B	A
				(67.3)		(66.6)				(11.4)	(11.2)		(7.4)	(13.1)	(8.6)
			(13.7)	E			(70.1)			B			B		
				(67.3)						(11.2)			(12.9)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		A	-			-	A	-	-	A	A
						(9.8)					(0.0)			(0.0)	(0.0)
			(0.1)	A			-			A			A		
				(9.8)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	D	**E**	**E**	D	**E**			C	B		A	D	**F**
				(73.3)	(73.6)	(52.9)				(34.0)	(15.9)		(6.9)	(44.1)	(116.1)
			(48.3)	E			(71.2)			C			E		
				(67.3)						(22.6)			(62.3)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	D			-			B	A		A		A
										(11.4)	(0.0)		(0.0)		(0.0)
			(0.5)	(31.8)						A			A		
										(0.1)			(0.0)		
5	Benns Church Boulevard at Site Driveway #1	Unsignalized	A	-		B	-			-	A	-	-	A	A
						(13.6)					(0.0)			(0.0)	(0.0)
			(0.5)	B			-			A			A		
				(13.6)						(0.0)			(0.0)		
6	Benns Church Boulevard at Site Driveway #2	Unsignalized	A	-		A	-			-	A	-	-	A	A
						(9.6)					(0.0)			(0.0)	(0.0)
			(0.3)	A			-			A			A		
				(9.6)						(0.0)			(0.0)		
7	Benns Church Boulevard at Site Driveway #3	Unsignalized	A	-		C	-			B	A	-	-	A	A
						(15.7)				(10.3)	(0.0)			(0.0)	(0.0)
			(1.5)	C			-			A			A		
				(15.7)						(0.2)			(0.0)		
8	Tractor Supply Entrance at Site Driveway #4	Unsignalized	A	-	A		A		-	A	-	A	-		
					(0.0)		(7.2)			(8.3)		(8.3)			
			(7.5)	A			A			A			-		
				(0.0)			(7.2)			(8.3)					
9	Turner Drive at Site Driveway #5	Unsignalized	A	A			A			A			A		
			(7.2)	(6.2)			(8.2)			(5.6)			(6.3)		
10	Tractor Supply Entrance at Site Driveway #6	Unsignalized	A	A		-	-	A		-			A	-	A
				(0.0)				(0.0)					(8.5)		(8.5)
			(6.1)	A			A						A		
				(0.0)			(0.0)						(8.5)		
11	Site Driveway #3 at Site Driveway #5	Unsignalized	A	A		-	-	A		-			A	-	A
				(0.0)				(0.0)					(0.0)		(0.0)
			(0.0)	A			A						A		
				(0.0)			(0.0)						(0.0)		

Table 12: 2025 PM Build LOS Summary

ID	Intersection	Traffic Control	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
				Eastbound			Westbound			Northbound			Southbound		
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
PM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	C	**E** (73.2)		**E** (61.9)	**E**			C (28.8)	B (15.9)		B (13.9)	C (22.9)	B (14.3)
			(23.1)	E (67.6)			(79.8)			B (17.7)			C (22.1)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		A (9.5)	-			-	A (0.0)	-	-	A (0.0)	A (0.0)
			(0.1)	A (9.5)			-			A (0.0)			A (0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	C	**E** (68.5)	**E** (69.0)	**E** (57.3)	**E**			D (40.8)	B (19.7)		A (6.5)	C (34.0)	D (41.2)
			(33.2)	E (65.3)			(71.3)			C (23.8)			C (34.4)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	**F**			-			B (12.7)	A (0.0)		A (0.0)		A (0.0)
			(0.6)	(56.5)			-			A (0.2)			A (0.0)		
5	Benns Church Boulevard at Site Driveway #1	Unsignalized	A	-		C (15.6)	-			-	A (0.0)	-	-	A (0.0)	A (0.0)
			(0.3)	C (15.6)			-			A (0.0)			A (0.0)		
6	Benns Church Boulevard at Site Driveway #2	Unsignalized	A	-		A (9.9)	-			-	A (0.0)	-	-	A (0.0)	A (0.0)
			(0.2)	A (9.9)			-			A (0.0)			A (0.0)		
7	Benns Church Boulevard at Site Driveway #3	Unsignalized	A	-		C (15.5)	-			B (12.0)	A (0.0)	-	-	A (0.0)	A (0.0)
			(0.5)	C (15.5)			-			A (0.2)			A (0.0)		
8	Tractor Supply Entrance at Site Driveway #4	Unsignalized	A	-	A (0.0)		A (7.2)		-	A (8.3)	-	A (8.3)	-		
			(7.6)	A (0.0)			A (7.2)			A (8.3)					
9	Turner Drive at Site Driveway #5	Unsignalized	A	A			A			A			A		
			(6.1)	(5.8)			(6.7)			(4.9)			(5.6)		
10	Tractor Supply Entrance at Site Driveway #6	Unsignalized	A	A (0.0)		-	-	A (0.0)		-			A (0.0)	-	A (0.0)
			(0.0)	A (0.0)			A (0.0)						A (0.0)		
11	Site Driveway #3 at Site Driveway #5	Unsignalized	A	A (0.0)		-	-	A (0.0)		-			A (8.7)	-	A (8.7)
			(8.7)	A (0.0)			A (0.0)						A (8.7)		

Table 13: 2029 AM Build LOS Summary

ID	Intersection	Traffic Control	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
				Eastbound			Westbound			Northbound			Southbound		
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	D	**F**		**E**	**F**			D	D		D	C	B
				(80.6)		(63.6)				(52.5)	(36.3)		(36.0)	(35.0)	(18.5)
			(39.1)	E			(80.3)			D			C		
				(70.8)						(37.3)			(34.6)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		B	-			-	A	-	-	A	A
						(10.8)					(0.0)			(0.0)	(0.0)
			(0.3)	B						A			A		
				(10.8)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	D	**F**	**F**	D	**E**			D	C	B	A	C	B
				(92.8)	(92.0)	(52.4)				(44.9)	(21.2)	(15.4)	(6.7)	(30.6)	(12.6)
			(37.9)	E			(73.1)			C			C		
				(77.0)						(28.6)			(26.9)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	**F**			-			C	A		A		A
										(15.6)	(0.0)		(0.0)		(0.0)
			(1.8)	(161.0)						A			A		
										(0.1)			(0.0)		
5	Benns Church Boulevard at Site Driveway #1	Unsignalized	A	-		C	-			-	A	-	-	A	A
						(17.8)					(0.0)			(0.0)	(0.0)
			(0.5)	C						A			A		
				(17.8)						(0.0)			(0.0)		
6	Benns Church Boulevard at Site Driveway #2	Unsignalized	A	-		B	-			-	A	-	-	A	A
						(10.7)					(0.0)			(0.0)	(0.0)
			(0.3)	B						A			A		
				(10.7)						(0.0)			(0.0)		
7	Benns Church Boulevard at Site Driveway #3	Signalized	D	**E**	**E**		**E**	**E**		B	B	A	B	D	**F**
				(72.6)	(66.8)		(77.6)	(60.2)		(18.3)	(12.4)	(8.6)	(11.4)	(38.6)	(98.3)
			(39.0)	E			E			B			D		
				(68.1)			(71.8)			(13.3)			(46.8)		
8	Tractor Supply Entrance at Site Driveway #4	Unsignalized	A	-	A		A		-	A	-	A	-		
					(0.0)		(6.6)			(8.7)		(8.7)			
			(6.4)	A			A			A			-		
				(0.0)			(6.6)			(8.7)					
9	Turner Drive at Site Driveway #5	Unsignalized	B	B			A			A			A		
			(11.1)	(13.6)			(9.8)			(9.8)			(7.9)		
10	Tractor Supply Entrance at Site Driveway #6	Unsignalized	A	A		-	-	A		-			A	-	A
				(0.0)				(0.0)					(8.6)		(8.6)
			(5.4)	A			A						A		
				(0.0)			(0.0)						(8.6)		
11	Site Driveway #3 at Site Driveway #5	Unsignalized	A	A		-	-	A		-			B	-	B
				(0.0)				(0.0)					(13.9)		(13.9)
			(2.5)	A			A						B		
				(0.0)			(0.0)						(13.9)		
12	Benns Church Boulevard at Site Driveway #7	Unsignalized	A	-			-	B		-	A	A	-	A	-
								(13.0)			(0.0)	(0.0)		(0.0)	
			(0.2)				B			A			A		
							(13.0)			(0.0)			(0.0)		

Table 14: 2029 PM Build LOS Summary

ID	Intersection	Traffic Control	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
				Eastbound			Westbound			Northbound			Southbound		
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
PM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	D	**F**		**E**	**F**			**E**	C		D	D	B
				(105.3)		(62.3)				(65.5)	(33.2)		(36.8)	(43.4)	(19.8)
			(50.0)	F			(260.3)			D			D		
				(84.1)						(38.3)			(41.2)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		B	-			-	A	-	-	A	A
						(11.6)					(0.0)			(0.0)	(0.0)
			(0.2)	B						A			A		
				(11.6)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	D	**E**	**E**	**E**	**F**			D	B	B	B	D	B
				(75.5)	(75.1)	(55.8)				(54.0)	(15.8)	(16.3)	(15.3)	(38.8)	(11.9)
			(35.2)	E			(116.4)			C			C		
				(69.0)						(23.4)			(34.4)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	**F**			-			C	A		A		A
										(16.2)	(0.0)		(0.0)		(0.0)
			(2.4)	(330.7)						A			A		
										(0.2)			(0.0)		
5	Benns Church Boulevard at Site Driveway #1	Unsignalized	A	-		C	-			-	A	-	-	A	A
						(20.5)					(0.0)			(0.0)	(0.0)
			(0.4)	C						A			A		
				(20.5)						(0.0)			(0.0)		
6	Benns Church Boulevard at Site Driveway #2	Unsignalized	A	-		B	-			-	A	-	-	A	A
						(11.3)					(0.0)			(0.0)	(0.0)
			(0.2)	B						A			A		
				(11.3)						(0.0)			(0.0)		
7	Benns Church Boulevard at Site Driveway #3	Signalized	D	**E**		**E**	**E**		**E**	B	C	B	C	D	**E**
				(74.8)		(69.9)	(73.3)		(63.7)	(10.6)	(27.9)	(14.1)	(30.2)	(36.4)	(56.1)
			(36.7)	E			E			C			D		
				(71.5)			(69.5)			(25.4)			(36.8)		
8	Tractor Supply Entrance at Site Driveway #4	Unsignalized	A	-	A		A		-	A	-	A	-		
					(0.0)		(5.4)			(8.9)		(8.9)			
			(6.2)	A			A			A			-		
				(0.0)			(5.4)			(8.9)					
9	Turner Drive at Site Driveway #5	Unsignalized	A	A			A			A			A		
			(8.6)	(8.4)			(9.4)			(6.7)			(7.9)		
10	Tractor Supply Entrance at Site Driveway #6	Unsignalized	A	A		-	-	A					A	-	A
				(0.0)				(0.0)					(8.7)		(8.7)
			(2.5)	A			A			-			A		
				(0.0)			(0.0)						(8.7)		
11	Site Driveway #3 at Site Driveway #5	Unsignalized	A	A		-	-	A					A	-	A
				(0.0)				(0.0)					(9.1)		(9.1)
			(9.1)	A			A			-			A		
				(0.0)			(0.0)						(9.1)		
12	Benns Church Boulevard at Site Driveway #7	Unsignalized	A	-			-		C	-	A	A	-	A	-
									(20.2)		(0.0)	(0.0)		(0.0)	
			(0.2)				C			A			A		
							(20.2)			(0.0)			(0.0)		

Table 15: 2045 AM Build LOS Summary

ID	Intersection	Traffic Control	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
				Eastbound			Westbound			Northbound			Southbound		
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	D	**F**		**E**	**F**	**F**	D	**E**	D		**E**	D	C
				(144.9)		(66.1)	> 300	> 300	(39.4)	(68.0)	(40.4)		(57.2)	(36.3)	(23.5)
			(54.7)	F			F			D			D		
				(98.6)			(265.9)			(42.1)			(37.3)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		A	-			-	A	-	-	A	A
						(10.0)					(0.0)			(0.0)	(0.0)
			(0.3)	A						A			A		
				(10.0)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	D	**F**	**F**	D	**E**	**E**	**E**	D	C	B	A	C	C
				(121.5)	(118.5)	(53.6)	(71.5)	(72.1)	(67.2)	(39.7)	(20.1)	(15.9)	(7.3)	(24.1)	(24.9)
			(39.2)	F			E			C			C		
				(93.9)			(71.4)			(25.8)			(24.2)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	A	**F**			-			C	A		A		A
										(19.3)	(0.0)		(0.0)		(0.0)
			(6.7)	> 300						A			A		
										(0.2)			(0.0)		
5	Benns Church Boulevard at Site Driveway #1	Unsignalized	A	-		B	-			-	A	-	-	A	A
						(14.5)					(0.0)			(0.0)	(0.0)
			(0.4)	B						A			A		
				(14.5)						(0.0)			(0.0)		
6	Benns Church Boulevard at Site Driveway #2	Unsignalized	A	-		A	-			-	A	-	-	A	A
						(9.9)					(0.0)			(0.0)	(0.0)
			(0.2)	A						A			A		
				(9.9)						(0.0)			(0.0)		
7	Benns Church Boulevard at Site Driveway #3	Signalized	D	**E**	**E**		**E**	**E**		C	B	A	B	D	**F**
				(72.6)	(68.2)		(77.6)	(59.7)		(26.2)	(11.6)	(8.8)	(13.2)	(40.5)	(125.3)
			(40.3)	E			E			B			D		
				(69.2)			(71.6)			(14.0)			(51.2)		
8	Tractor Supply Entrance at Site Driveway #4	Unsignalized	A	-	A		A		-	A	-	A	-		
					(0.0)		(6.6)			(8.7)		(8.7)			
			(6.4)	A			A			A					
				(0.0)			(6.6)			(8.7)					
9	Turner Drive at Site Driveway #5	Unsignalized	B	C			A			A			A		
			(14.6)	(18.8)			(12.3)			(11.7)			(9.3)		
10	Tractor Supply Entrance at Site Driveway #6	Unsignalized	A	A		-	-	A					A	-	A
				(0.0)				(0.0)					(8.6)		(8.6)
			(5.4)	A			A			-			A		
				(0.0)			(0.0)						(8.6)		
11	Site Driveway #3 at Site Driveway #5	Unsignalized	A	A		-	-	A					B	-	B
				(0.0)				(0.0)					(13.9)		(13.9)
			(2.5)	A			A			-			B		
				(0.0)			(0.0)						(13.9)		
12	Benns Church Boulevard at Site Driveway #7	Unsignalized	A	-			-	B		-	A	A	-	A	-
								(11.6)			(0.0)	(0.0)		(0.0)	
			(0.1)				B			A			A		
							(11.6)			(0.0)			(0.0)		

Table 16: 2045 PM Build LOS Summary

ID	Intersection	Traffic Control	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
				Eastbound			Westbound			Northbound			Southbound		
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
PM Peak Hour															
1	Benns Church Boulevard at Cypress Run Drive	Signalized	D	**F**		**E**	**F**	**F**	**E**	**E**	C		D	C	B
				(132.5)		(62.2)	(145.2)	(156.8)	(67.5)	(76.8)	(31.0)		(40.6)	(29.6)	(19.1)
			(41.5)	F			F			D			C		
				(97.9)			(101.4)			(37.9)			(29.4)		
2	Benns Church Boulevard at Tractor Supply Entrance	Unsignalized	A	-		B	-			-	A	-	-	A	A
						(10.1)					(0.0)			(0.0)	(0.0)
			(0.2)	B						A			A		
				(10.1)						(0.0)			(0.0)		
3	Benns Church Boulevard at Turner Drive	Signalized	C	**F**	**F**	**E**	**F**	**F**	**E**	D	B	B	C	C	C
				(82.0)	(82.5)	(55.1)	(140.6)	(96.5)	(64.4)	(48.7)	(13.6)	(17.4)	(21.9)	(30.6)	(29.0)
			(33.5)	E			F			C			C		
				(73.5)			(114.0)			(20.3)			(30.2)		
4	Benns Church Boulevard at Red Oak Drive	Unsignalized	B	**F**			-			C	A		A		A
										(21.9)	(0.0)		(0.0)		(0.0)
			(10.2)	> 300						A			A		
										(0.3)			(0.0)		
5	Benns Church Boulevard at Site Driveway #1	Unsignalized	A	-		C	-			-	A	-	-	A	A
						(15.9)					(0.0)			(0.0)	(0.0)
			(0.3)	C						A			A		
				(15.9)						(0.0)			(0.0)		
6	Benns Church Boulevard at Site Driveway #2	Unsignalized	A	-		B	-			-	A	-	-	A	A
						(10.1)					(0.0)			(0.0)	(0.0)
			(0.1)	B						A			A		
				(10.1)						(0.0)			(0.0)		
7	Benns Church Boulevard at Site Driveway #3	Signalized	D	**E**		**E**	**E**		**E**	B	C	B	D	D	**E**
				(74.8)		(75.1)	(73.3)		(62.5)	(10.8)	(22.5)	(14.1)	(38.8)	(37.3)	(71.0)
			(35.1)	E			E			C			D		
				(75.0)			(69.1)			(21.1)			(39.2)		
8	Tractor Supply Entrance at Site Driveway #4	Unsignalized	A	-	A		A		-	A	-	A	-		
					(0.0)		(5.4)			(8.9)		(8.9)			
			(6.2)	A			A			A			-		
				(0.0)			(5.4)			(8.9)					
9	Turner Drive at Site Driveway #5	Unsignalized	B	A			A			A			A		
			(10.3)	(9.8)			(11.5)			(7.5)			(9.2)		
10	Tractor Supply Entrance at Site Driveway #6	Unsignalized	A	A		-	-	A		-			A	-	A
				(0.0)				(0.0)					(8.7)		(8.7)
			(2.5)	A			A						A		
				(0.0)			(0.0)						(8.7)		
11	Site Driveway #3 at Site Driveway #5	Unsignalized	A	A		-	-	A		-			A	-	A
				(0.0)				(0.0)					(9.1)		(9.1)
			(9.1)	A			A						A		
				(0.0)			(0.0)						(9.1)		
12	Benns Church Boulevard at Site Driveway #7	Unsignalized	A	-			-		C	-	A	A	-	A	-
									(15.5)		(0.0)	(0.0)		(0.0)	
			(0.2)				C			A			A		
							(15.5)			(0.0)			(0.0)		

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 PROJECT BACKGROUND

The purpose of the Benns Church TIA is to serve as a planning level document to analyze existing and future traffic conditions within the study area, identify necessary roadway improvements in order to serve future traffic demands, and determine potential long-term solutions along Benns Church Boulevard to support planning efforts for Isle of Wight County, the Town of Smithfield, and the Virginia Department of Transportation.

A study work group (SWG) was formed to obtain concurrence on study assumptions and identify potential roadway improvements within the study area. The SWG included members from the following organizations:

- Virginia Department of Transportation (VDOT)
- Isle of Wight County
- Town of Smithfield
- Harrison and Lear, Inc.
- Greenwood Homes
- Kimley-Horn and Associates

The SWG regularly held meetings throughout the duration of the project to determine the study area, develop study assumptions, discuss operational analysis results, and identify potential roadway improvements within the study area. The study area was determined to include four (4) existing intersections along Benns Church Boulevard and eight (8) proposed study intersections. The intersections included in this study are included below:

1. Benns Church Boulevard (U.S. Route 258/State Route 10) at Cypress Run Drive (Signalized)
2. Benns Church Boulevard at Tractor Supply Entrance (Unsignalized – Right-In/Right-Out)
3. Benns Church Boulevard at Turner Drive (State Route 644) (Signalized)
4. Benns Church Boulevard at Red Oak Drive (Unsignalized – Full Movement)
5. Benns Church Boulevard at Site Driveway #1
6. Benns Church Boulevard at Site Driveway #2
7. Benns Church Boulevard at Site Driveway #3
8. Tractor Supply Entrance at Site Driveway #4
9. Turner Drive at Site Driveway #5
10. Tractor Supply Entrance at Site Driveway #6
11. Site Driveway #3 at Site Driveway #5
12. Benns Church Boulevard at Site Driveway #7

Table 17 summarizes the anticipated developments, roadway geometry, and traffic volumes included in the existing and future analysis scenarios.

Table 17: Summary of Analysis Scenarios

Scenario	Developments Included	Roadway Conditions	Traffic Volumes
Scenario 1: Existing Conditions (2022)	No Developments Included	Existing Conditions Figure 2	2022 Existing Figure 3
Scenario 2: Interim Year (2025) No-Build Conditions	No Developments Included	Existing Conditions Figure 2	Existing Volumes **+** **3 Years of Background Growth (1.0% Annually)** Figure 4
Scenario 3: Interim Year (2025) Build Conditions	**Turner North – Parcels 2 and 5** **Turner South – Parcels 6 and 13**	No Build Conditions **+** **Site Driveways** **Full Build-Out of all Public Roads** **Smithfield High School Roadway Connection with right-in/right-out/left-in configuration at Intersection #7** Figure 8	2025 Background Volumes **+** **Proposed Development Trips** Figure 5
Scenario 4: Future Year (2029) Build Conditions	**Turner North – Full Build-Out** **Turner South – Full Build-Out** **Cypress Run South** **50% of Smithfield Development** **Smithfield Intermediate School** **Sweetgrass – Full Build-Out**	Interim Year (2025) Build Conditions + **Signalized Intersection at Intersection #7 (By Others)** Figure 9	Existing Volumes **+** **7 Years of Background Growth (1.0% Annually)** **Proposed Development Trips** Figure 6
Scenario 5: Horizon Year (2045) Build Conditions	**Turner North – Full Build-Out** **Turner South – Full Build-Out** **Smithfield Development – Full Build-Out** **Smithfield Intermediate School** **Sweetgrass – Full Build-Out**	Future Year (2029) Build Conditions Figure 10	Existing Volumes**+** **23 Years of Background Growth (1.0% Annually)** **Proposed Development Trips** Figure 7

6.2 PROPOSED RECOMMENDATIONS

Based on the operational analysis and discussions with the SWG, several recommendations were recommended at the study area intersections. These recommendations are summarized below:

Interim Year (2025) Recommendations

- Turn lane improvements as described below:
  - Exclusive southbound right-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #1 *(Int. #5)*
  - Exclusive southbound right-turn lane with a storage length of 100 feet and a 100-foot taper at the intersection of Benns Church Boulevard and Site Driveway #2 *(Int. #6)*
  - Extend the existing exclusive northbound left-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7).* It should be noted that an increase in storage length for this movements is warranted and recommended in 2029. It is recommended that the full turn lane with a storage length of 200 feet and a 200-foot taper be constructed in 2025 when the connection to Benns Church Boulevard is made.
- Single-Lane Roundabout at the intersection of Turner Drive and Site Driveway #5 *(Int. #9)*
- Modify eastbound approach geometry at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to include the following laneage:
  - Exclusive left-turn lane
  - Shared through-left turn lane
  - Exclusive right-turn lane with a storage length of 250 feet and a 115-foot taper

Future Year (2029) Recommendations

In addition to the recommendations included in the 2025 analysis scenarios, the following recommendations are included in the 2029 analysis scenarios:

- Turn lane improvements as described below:
  - Exclusive southbound right-turn lane with a storage length of 100 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Tractor Supply Entrance *(Int. #2)*
  - Exclusive northbound left-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive northbound right-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive southbound left-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
  - Exclusive southbound right-turn lane with a storage length of 200 feet and a 200-foot taper at the intersection of Benns Church Boulevard and Site Driveway #3 *(Int. #7)*
- Install a traffic signal at the intersection of Benns Church Boulevard and Site Driveway #3/Sweetgrass Driveway *(Int. #7).* This traffic signal will be completed as part of the Sweetgrass development.

- Provide an additional exclusive northbound left-turn lane at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to provide a dual-left turn movement

Horizon Year (2045) Recommendations

In addition to the recommendations included in the 2029 analysis scenarios and the proposed turn lane improvements, the following recommendations are included in the 2045 analysis scenarios:

- Widen Benns Church Boulevard to a six-lane roadway (three lanes in each direction) within the study area
- Modify the westbound approach geometry at the intersection of Benns Church Boulevard and Cypress Run Drive *(Int. #1)* to include the following laneage:
  - Exclusive left-turn lane
  - Shared through-left turn lane
  - Exclusive right-turn lane with a storage length of 100 feet and a 100-foot taper
- Modify the westbound approach geometry at the intersection of Benns Church Boulevard and Turner Drive *(Int. #3)* to include the following laneage:
  - Exclusive left-turn lane
  - Shared through-left turn lane
  - Exclusive right-turn lane with a storage length of 100 feet and a 100-foot taper

The proposed roadway improvements are also summarized in **Figure 8** through **Figure 10**.

6.3 OVERALL SITE TRAFFIC CONTRIBUTION

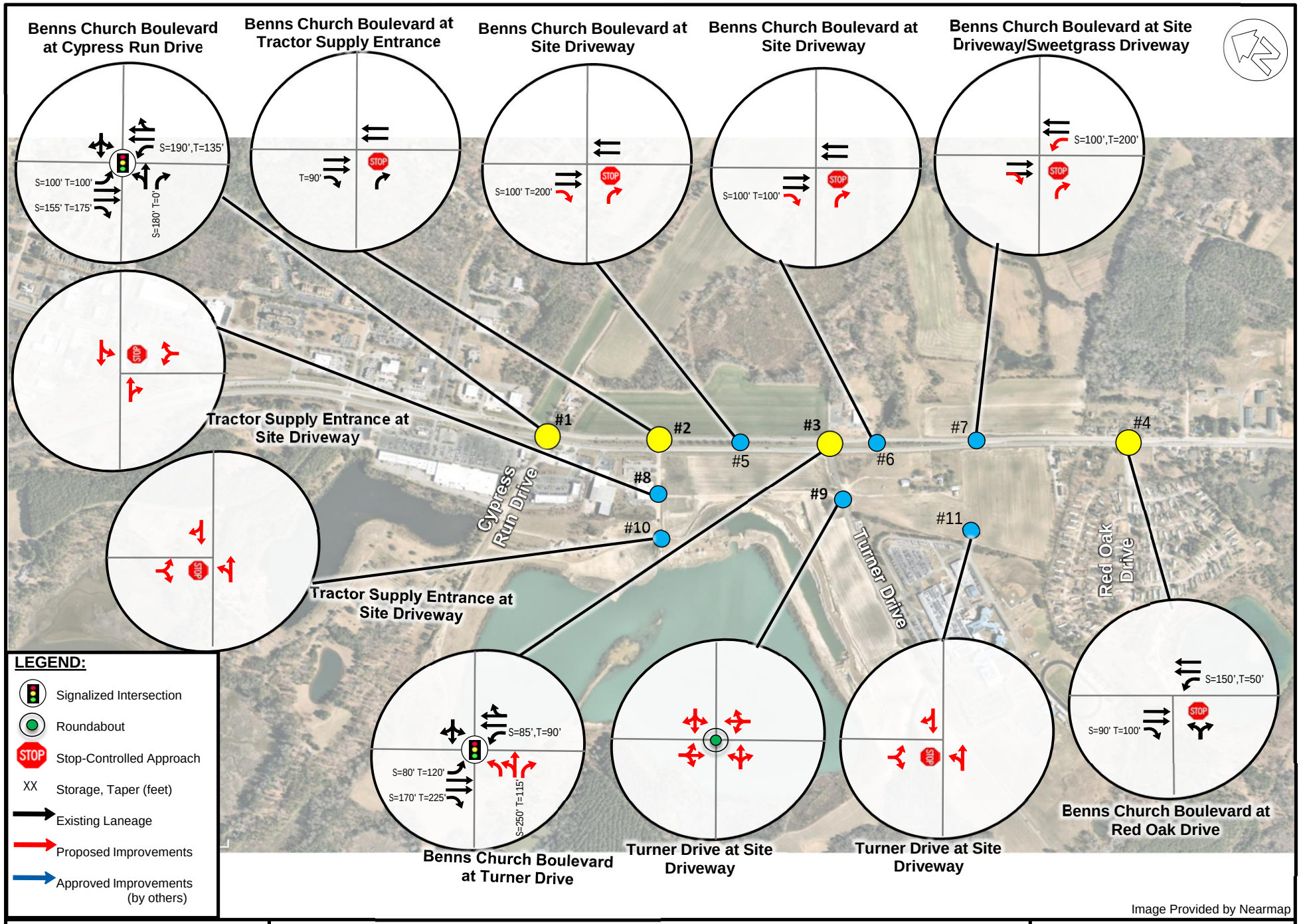
In order to support the implementation of the proposed improvements recommended as part of this TIA, site traffic assignments were reviewed to determine the breakdown of traffic under the 2025 and 2029 Build scenarios as it pertains to each development. **Table 18** and **Table 19** summarize the percent of traffic by development (i.e., Turner North & South, Cypress Run South, and background traffic) at the locations where roadway improvements are recommended. This data is provided for informational purposes only and may be utilized by the SWG to aid in the determination of cost-sharing when implementing the proposed improvements.

Table 18: 2025 Peak Hour Site Traffic Breakdown

2025 Build Scenario									
No.	Intersection	AM Peak Hour Traffic by Source				PM Peak Hour			
		Turner North & South	Cypress Run South	Other	Total	Turner North & South	Cypress Run South	Other	Total
1	Benns Church Blvd at Cypress Run Dr	No Recommendations							
2	Benns Church Blvd at Tractor Supply	No Recommendations							
3	Benns Church Blvd at Turner Dr	9%	0%	91%	*100%*	7%	0%	93%	*100%*
4	Benns Church Blvd at Red Oak Dr	No Recommendations							
5	Benns Church Blvd at Site Driveway	8%	0%	92%	*100%*	6%	0%	94%	*100%*
6	Benns Church Blvd at Site Driveway	7%	0%	93%	*100%*	4%	0%	96%	*100%*
7	Benns Church Blvd at Site Driveway/Sweetgrass	5%	0%	95%	*100%*	4%	0%	96%	*100%*
8	Tractor Supply Entrance at Site Driveway	No Recommendations							
9	Turner Drive at Site Driveway	31%	0%	69%	*100%*	36%	0%	64%	*100%*
10	Tractor Supply Entrance at Site Driveway	No Recommendations							
11	Turner Drive at Site Driveway	No Recommendations							
12	Benns Church Blvd at Site Driveway	No Recommendations							

Table 19: 2025 Peak Hour Site Traffic Breakdown

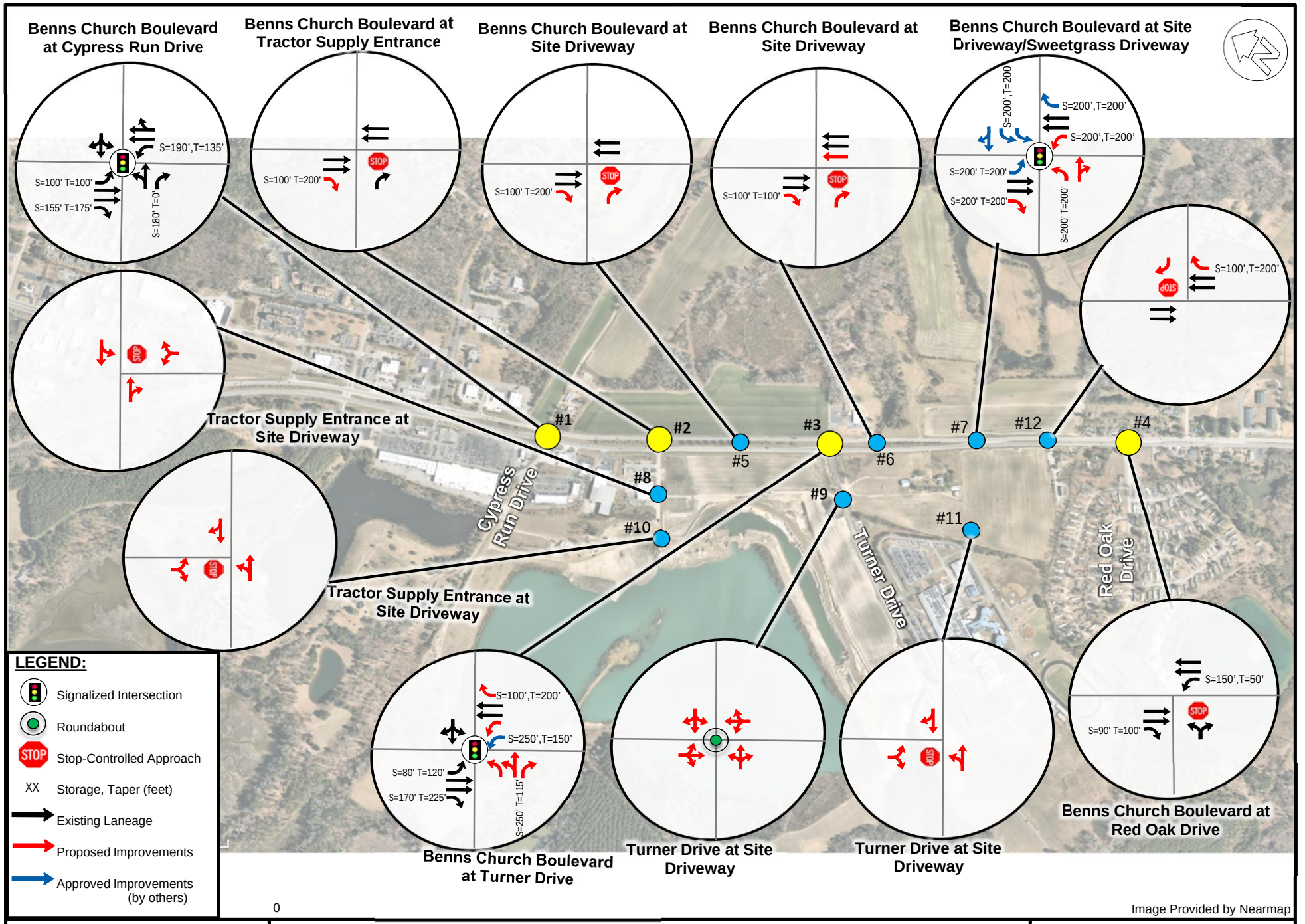
2029 Build Scenario									
No.	Intersection	AM Peak Hour Traffic by Source				PM Peak Hour			
		Turner North & South	Cypress Run South	Other	Total	Turner North & South	Cypress Run South	Other	Total
1	Benns Church Blvd at Cypress Run Dr	No Recommendations							
2	Benns Church Blvd at Tractor Supply	10%	3%	87%	*100%*	7%	4%	89%	*100%*
3	Benns Church Blvd at Turner Dr	10%	2%	88%	*100%*	7%	3%	90%	*100%*
4	Benns Church Blvd at Red Oak Dr	No Recommendations							
5	Benns Church Blvd at Site Driveway	10%	3%	87%	*100%*	7%	3%	90%	*100%*
6	Benns Church Blvd at Site Driveway	7%	2%	91%	*100%*	5%	2%	93%	*100%*
7	Benns Church Blvd at Site Driveway/Sweetgrass	10%	2%	88%	*100%*	7%	2%	91%	*100%*
8	Tractor Supply Entrance at Site Driveway	No Recommendations							
9	Turner Drive at Site Driveway	25%	2%	73%	*100%*	26%	3%	71%	*100%*
10	Tractor Supply Entrance at Site Driveway	No Recommendations							
11	Turner Drive at Site Driveway	No Recommendations							
12	Benns Church Blvd at Site Driveway	12%	3%	85%	*100%*	7%	3%	90%	*100%*



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INTERIM YEAR (2025) RECOMMENDATIONS

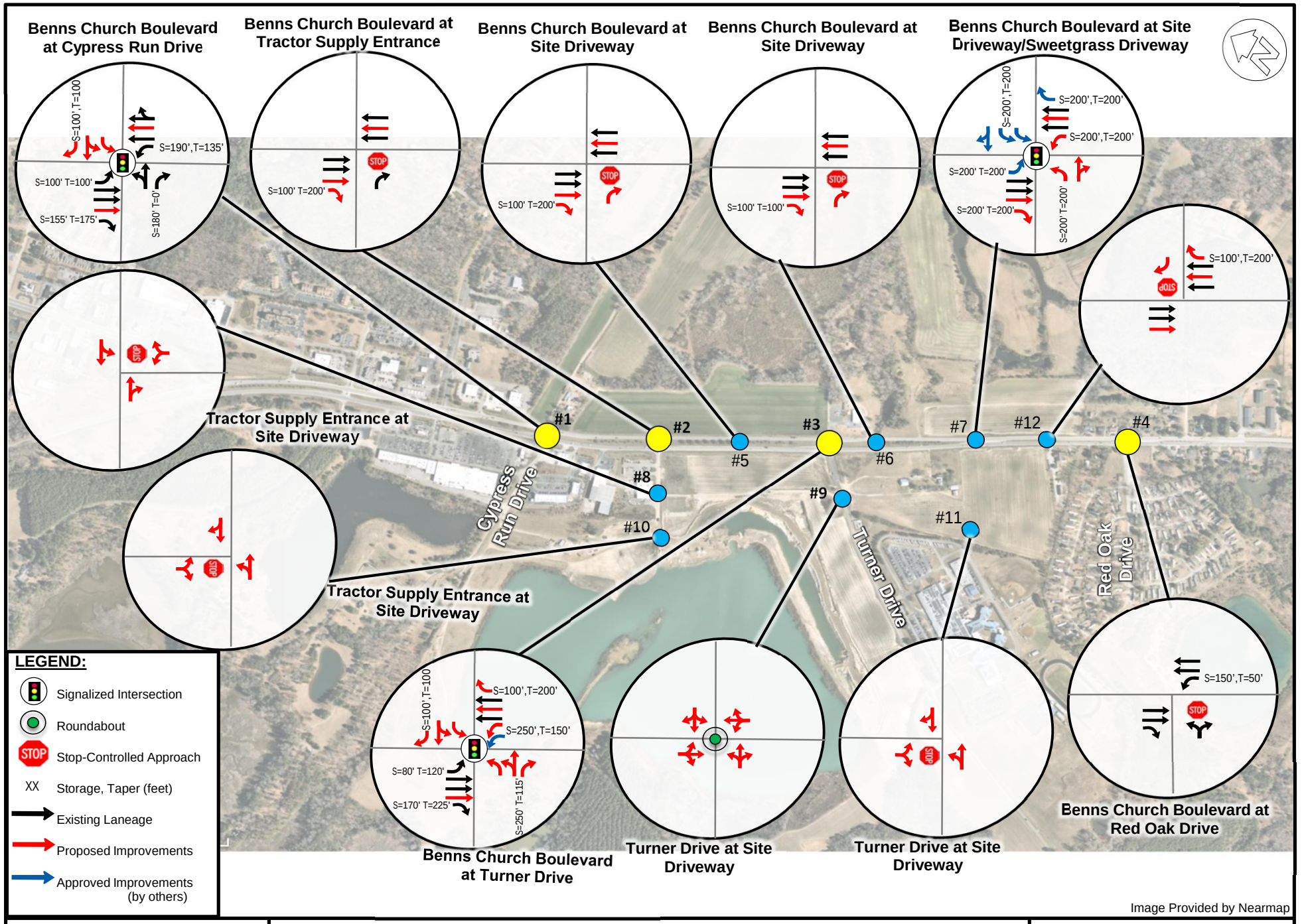
FIGURE 8



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FUTURE YEAR (2029) RECOMMENDATIONS

FIGURE 9



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HORIZON YEAR (2045) RECOMMENDATIONS

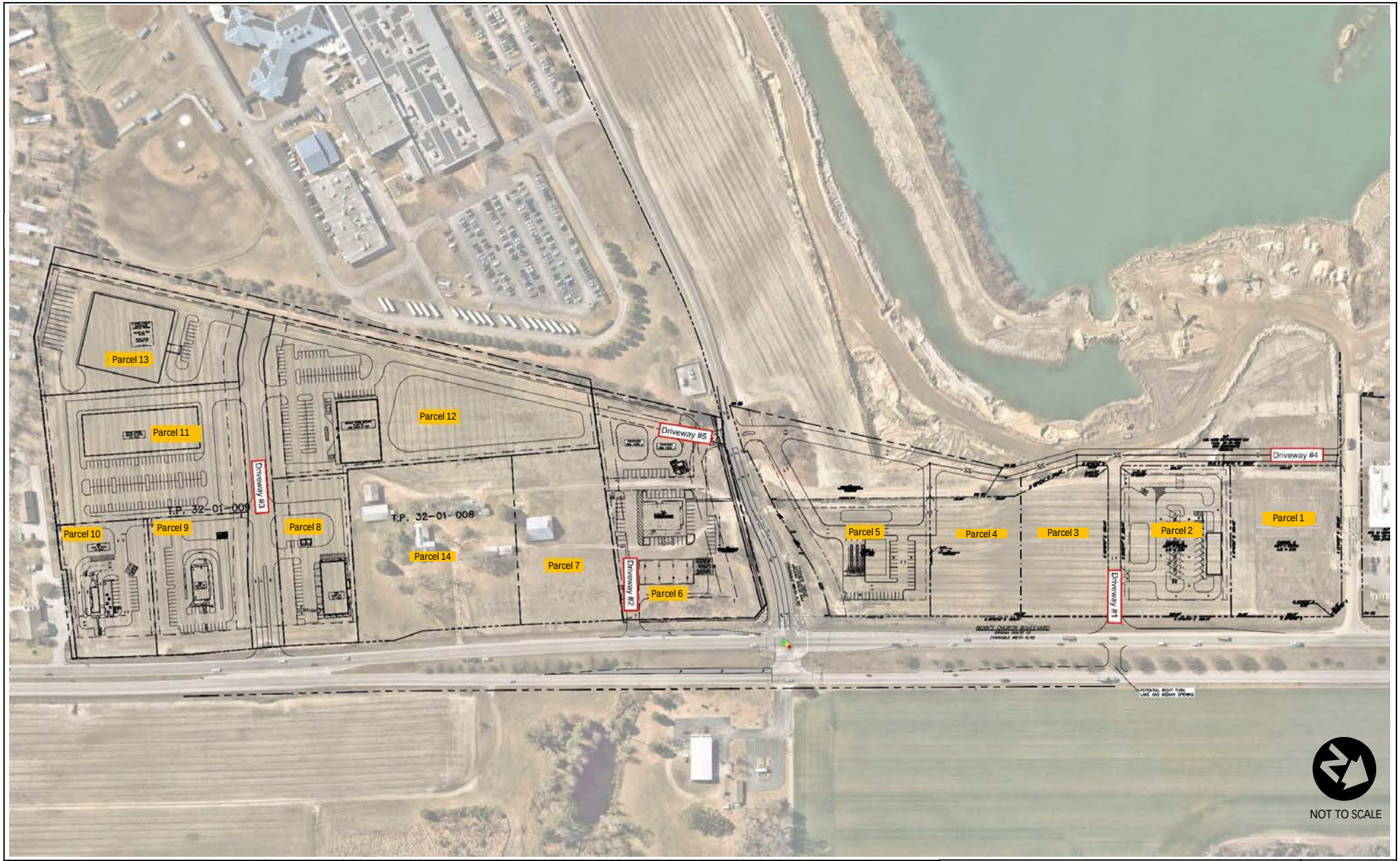
FIGURE 10

Appendix A
Conceptual Site Plan



Kimley»Horn	Benns Church TIA Isle of Wight, Virginia	Proposed Developments	Figure 1

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.



Kimley»Horn	Benns Church TIA Isle of Wight, Virginia	Conceptual Master Plan for Turner North and Turner South Parcels	Figure 2

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

Appendix B

Approved Pre-Scope Form and Assumptions Document

The following documentation outlines the assumptions for the proposed development associated with the Benns Church TIA located in Isle of Wight County, Virginia.

The proposed developments of the TIA consist of the following and are illustrated in **Figure 1** with detailed parcel locations for Turner North and South in **Figure 2**:

- **Turner North**
  - Parcel 1: 5,000 square foot (SF) quick service restaurant
  - Parcel 2: 3,000 (SF) automated car wash
  - Parcel 3: 3,000 (SF) high-turnover (sit-down) restaurant
  - Parcel 4: 3,000 (SF) high-turnover (sit-down) restaurant
  - Parcel 5: Drive-in bank with 4 lanes
- **Turner South**
  - Parcel 6: 6,049 SF convenience market with 16 fueling positions
  - Parcel 7: 3,000 SF quick service restaurant
  - Parcel 8: 7,680 SF tire store
  - Parcel 9: 3,235 SF quick service restaurant
  - Parcel 10: 3,000 SF quick service restaurant
  - Parcel 11: 28,000 SF of retail space
  - Parcel 12: 21,500 SF of medical office space
  - Parcel 13: 108,000 SF of climate controlled self-storage space
  - Parcel 14: 28,000 SF of retail space
- **Cypress Run South**
  - 154 single-family detached housing dwelling units
  - 108 single-family attached housing dwelling units

Study Area

The study area consists of the following existing intersections, as shown in **Figure 3**:

1. Benns Church Boulevard (U.S. Route 258/State Route 10) at Cypress Run Drive *(Signalized)*
2. Benns Church Boulevard at Tractor Supply Entrance *(Unsignalized – Right-In/Right-Out)*
3. Benns Church Boulevard at Turner Drive (State Route 644) *(Signalized)*
4. Benns Church Boulevard at Red Oak Drive *(Unsignalized – Full Movement)*

The following proposed development driveways are also included in the study area as shown in **Figure 3**. The appropriate intersection access and control will be identified as part of the traffic analysis scenarios.

5. Benns Church Boulevard at Site Driveway #1
6. Benns Church Boulevard at Site Driveway #2
7. Benns Church Boulevard at Site Driveway #3
8. Tractor Supply Entrance at Site Driveway #4
9. Turner Drive at Site Driveway #5
10. Tractor Supply Entrance at Site Driveway #6
11. Site Driveway #3 at Site Driveway #5
12. Benns Church Boulevard and Site Driveway #7

Data Collection

Kimley-Horn will use the turning movement count (TMC) data, collected in August 2021, as part of the *Wawa Convenience Market Development Traffic Impact Analysis*, completed April 2022 for the intersection of Benns Church Boulevard at Cypress Run Drive.

Kimley-Horn will use the existing traffic volumes at the Benns Church Boulevard and Cypress Run Drive intersection and will include the COVID-19 adjustments consistent with the *Wawa Convenience Market Development Traffic Impact Analysis*.

In addition, Kimley-Horn will use the June 2022 traffic volumes collected by Isle of Wight County at the intersection of Benns Church Boulevard at Red Oak Drive. New traffic count data from December 2022 at the Benns Church Boulevard and Turner Drive intersection will be used in this study. The counts at the Benns Church Boulevard at Turner Drive intersection were collected with school in session and include bus traffic. Additional school bus route data was provided by the Isle of Wight County School Board staff. The school bus route data will be reviewed to verify the Benns Church Boulevard at Turner Drive counts accurately captures bus volumes.

Recent traffic volume counts are not available for the Tractor Supply Entrance intersection; therefore, Kimley-Horn will determine the intersection traffic volumes by using calculated trip generation for the existing land uses. Current traffic signal timing and phasing data will be provided by VDOT for all signalized intersections in the study area.

The AM (7:00 AM – 8:00 AM) and the PM (4:15 PM – 5:15 PM) peak hours will be used for this TIA.

Volume Development

It is proposed that a growth rate of 1.0% per year (applied exponentially) be used for adjusting the projected background traffic volumes for all turning movements. This growth rate was determined by reviewing the County average growth rate from VDOT as well as input from Isle of Wight County.

In addition, the following additional developments will be included in the future projected traffic volumes:

- Town of Smithfield Development:
  - Benns Church Retail North – retail commercial
  - Cypress Run North – residential and retail commercial
- Sweetgrass
  - 390 single-family detached housing dwelling units
  - 225 multi-family housing dwelling units
  - 35,000 square foot shopping center
- Smithfield Intermediate School – 400 pupils

Kimley-Horn will use the *Town of Smithfield Intersection Improvement Alternatives Analysis* Study completed in February 2019 for the trip generation, distribution, and assignment of the Benns Church Retail North and Cypress Run North developments. Kimley-Horn will use the Yeoman's Tract Traffic Impact Study for the trip generation, distribution, and assignment of the Sweetgrass development.

Proposed Land Use

Kimley-Horn will use *ITE Trip Generation 10th Edition* (2017) Trip Generation Rates and Land Uses for the proposed developments. Trip generation calculations for the proposed developments are shown in **Table 1** through **Table 3**.

Table 1: Turner North and Turner South Proposed Trip Generation

Parcel ID	ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
						Total	In	Out	Total	In	Out
NORTH											
1	934	Fast Food Restaurant with Drive-Through Window	5,000	SF	2,355	201	103	98	163	85	78
2	948	Automated Car Wash *	3,000	SF	430	32	17	15	43	22	22
3	932	High-Turnover (Sit-Down) Restaurant	3,000	SF	337	30	17	13	29	18	11
4	932	High-Turnover (Sit-Down) Restaurant	3,000	SF	337	30	17	13	29	18	11
5	912	Drive-In Bank	4	Lanes	499	35	21	14	109	53	56
		New External Site Trips			*3,958*	*328*	*175*	*153*	*373*	*196*	*178*
		Parcel 1: Code 934 Pass-By (49% AM, 50% PM)			*0*	*(96)*	*(49)*	*(47)*	*(80)*	*(42)*	*(38)*
		Parcel 2: Code 948 (0% AM, 0% PM)			*0*	*(0)*	*(0)*	*(0)*	*(0)*	*(0)*	*(0)*
		Parcel 3: Code 932 Pass-By (49% AM, 50% AM)			*0*	*(0)*	*(0)*	*(0)*	*(11)*	*(7)*	*(4)*
		Parcel 4: Code 932 Pass-By (49% AM, 50% AM)			*0*	*(0)*	*(0)*	*(0)*	*(11)*	*(7)*	*(4)*
		Parcel 5: Code 912 Pass-By (29% AM, 35% PM)			*0*	*(8)*	*(5)*	*(3)*	*(37)*	*(18)*	*(19)*
		New Driveway Trips			*3,958*	*218*	*118*	*100*	*232*	*121*	*112*
SOUTH											
6	960	Super Convenience Market/Gas Station	Average		4,378	508	254	254	393	197	196
7	934	Fast Food Restaurant with Drive-Through Window	3,000	SF	1,413	121	62	59	98	51	47
8	848	Tire Store	7,680	SF	219	21	13	8	31	13	18
9	934	Fast Food Restaurant with Drive-Through Window	3,235	SF	1,524	130	66	64	106	55	51
10	934	Fast Food Restaurant with Drive-Through Window	3,000	SF	1,413	121	62	59	98	51	47
11	822	Strip Retail Plaza (Less than 40,000 SF)**	28,000	SF	1,411	66	40	26	162	81	81
12	720	Medical-Dental Office Building	21,500	SF	738	57	44	13	75	21	54
13	151	Mini-Warehouse	108,000	SF	163	11	7	4	18	8	10
14	822	Strip Retail Plaza (Less than 40,000 SF)** ***	28,000	SF	1,411	66	40	26	162	81	81
		New Site Trips			*12,670*	*1,035*	*548*	*487*	*981*	*477*	*504*
		Internal Capture (10%)			*(813)*	*(58)*	*(33)*	*(26)*	*(73)*	*(35)*	*(38)*
		New External Site Trips			*11,857*	*976*	*515*	*461*	*908*	*442*	*466*
		Parcel 6: Code 960 Pass-by (63% AM, 66% PM)			*0*	*(320)*	*(160)*	*(160)*	*(259)*	*(130)*	*(129)*
		Parcel 7: Code 934 Pass-By (49% AM, 50% PM)			*0*	*(59)*	*(30)*	*(29)*	*(50)*	*(26)*	*(24)*
		Parcel 8: Code 848 Pass-By (28% PM)			*0*	*0*	*0*	*0*	*(9)*	*(4)*	*(5)*
		Parcel 9 Code 934 Pass-By (49% AM, 50% PM)			*0*	*(64)*	*(31)*	*(31)*	*(53)*	*(28)*	*(26)*
		Parcel 10: Code 934 Pass-By (49% AM, 50% PM)			*0*	*(59)*	*(30)*	*(29)*	*(50)*	*(26)*	*(24)*
		Parcel 11: Code 822 Pass-By (40% PM)			*0*	*0*	*0*	*0*	*(65)*	*(32)*	*(33)*
		Parcel 14: Code 822 Pass-By (40% PM)			*0*	*0*	*0*	*0*	*(65)*	*(32)*	*(33)*
		New Driveway Trips			11,857	474	263	212	359	165	192
		TOTAL New Driveway Site Trips			*15,815*	*696*	*384*	*315*	*592*	*288*	*306*

Source: ITE Trip Generation Manual, 10th Edition, (2017)

Pass-by percentages using ITE Trip Generation Handbook, 3rd Edition (2017)

** Parcel 2 Daily and AM peak hour trip generation were developed using ITE Trip Generation 11th Edition,(2021) LUC 949 Time of Day Distribution Table*

***Strip Retail Plaza trips estimated using the ITE Trip Generation Manual, 11th Edition, (2021)*

**** Parcel 14 square footage was estimated based on existing acreage and assumed parking area*

Table 2: Cypress Run South Proposed Trip Generation

ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
210	Single-Family Detached	154	DU	1,501	110	29	81	149	94	55
215	Single-Family Attached	108	DU	772	50	16	34	61	35	26
	New Driveway Trips			*2,273*	*160*	*45*	*115*	*210*	*129*	*81*

Source: ITE Trip Generation Manual, 10th Edition, (2017)

Table 3: Sweetgrass Proposed Trip Generation

ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
210	Single-Family Detached	390	DU	3,682	289	72	217	386	243	143
220	Multifamily Housing (Low rise)	225	DU	1,660	104	24	80	126	79	47
820	Shopping Center	35,000	SF	2,994	33	20	13	250	120	130
	New External Site Trips			*8,286*	*426*	*116*	*310*	*762*	*442*	*320*
	Code 820 Pass-By (34% PM)			*1,001*	*(11)*	*(7)*	*(4)*	*(85)*	*(41)*	*(44)*
	New Driveway Trips			*7,285*	*415*	*109*	*306*	*677*	*401*	*276*

Source: Sweetgrass Supplemental Memo to December 2019 Traffic Impact Study (2021)

Analysis Years

The proposed development is anticipated to be completed in 2029. Therefore, the following analysis scenarios for the AM and PM peak hours will be studied as part of this TIA. **Figure 4** through **Figure 6** graphically depict the Build traffic analysis scenarios and associated components (e.g., site driveways and roadway connections).

- **Scenario 1 – Existing (2022) traffic conditions**
- **Scenario 2 – Interim Year (2025) No-Build conditions**
  - Interim year traffic conditions with a future growth rate applied to approved base year traffic volumes but without traffic volumes generated by the proposed developments
- **Scenario 3 – Interim Year (2025) Build conditions (Figure 4)**
  - Interim year traffic conditions with a future growth rate applied to approved base year traffic volumes with traffic volumes generated by the following proposed developments.
    - Turner North – Parcels 2 and 5
    - Turner South – Parcels 6 and 13
    - Full build-out of all proposed public roads
    - Smithfield High School Roadway Connection with right-in/right-out/left-in (RIROLI) configuration at Intersection #7
- **Scenario 4 – Future Year (2029) Build conditions (Figure 5)**
  - Future year traffic conditions with a future growth rate applied to approved base year traffic volumes with traffic volumes generated by the following proposed developments.
    - Full build-out of Turner North – Parcels 1,3, and 4
    - Full build-out of Turner South – Parcels 7, 8, 9, 10,11, 12, and 14
    - Cypress Run South
    - Smithfield Intermediate School traffic

    - Full build-out of Sweetgrass with proposed roadway and intersection improvements (e.g., traffic signal at Intersection #7)
    - 50% of Smithfield Development Traffic
- **Scenario 5 – Horizon Year (2045) Build conditions (Figure 6)**
    - Future year traffic conditions with a future growth rate applied to approved base year traffic volumes with traffic volumes generated by the following proposed developments:
        - Full build-out of Smithfield Development Traffic

Site Trip Distributions

Site trip distributions from the *Wawa Convenience Market Development Traffic Impact Analysis* will be used for this TIA which were confirmed by reviewing available traffic data, anticipated routes for vehicles entering and exiting the proposed development site, and a general familiarity of the study area. Proposed regional trip distributions determined for the proposed development are listed below.

- To/from the west on Turner Drive – **20%**
- To/from the north on Benns Church Boulevard – **40%**
- To/from the south on Benns Church Boulevard – **40%**

Kimley-Horn will use the aforementioned studies for the trip distribution and assignment of the additional developments.

Recommendations

General recommendations for necessary capacity and operational improvements will be developed for the study area intersections, roadways, and site access driveways. Kimley-horn will then determine the need for more specific laneage or traffic control improvements (e.g., turn lanes, storage lane lengths, roundabouts, traffic signals, traffic signal timing modifications, etc.) at study intersections directly impacted by the proposed development.

For the purposes of this study, the following intersection control conditions will be held constant in support of the proposed development:

- Study Intersection 3: Benns Church Boulevard at Turner Drive
    - Maintain signalization at this intersection
- Study Intersection 6: Benns Church Boulevard at Site Driveway #2
    - Proposed right-in/right-out access
- Study Intersection 9: Turner Drive and Site Driveway #5
    - Proposed unsignalized, full-access intersection or single-lane roundabout

Traffic Signal Warrant Analysis

Kimley-Horn will use the *Manual of Uniform Traffic Control Devices (MUTCD)*, to analyze the signal warrants at up to two applicable study intersections.

To evaluate the need for signalized intersection operations, we will use the traffic volume data along with the projected traffic volumes. The traffic signal warrant analyses will adhere to *MUTCD* signal warrant guidelines.

Turn-Lane Warrant Analysis

Kimley-Horn will utilize the volume data collected along with the projected traffic to perform a turn-lane warrant analyses at up to five applicable study intersections with methodologies shown in Appendix C of the VDOT *Road Design Manual* as well as guidelines provided in Appendix F of the *VDOT Access Management Design Standards for Entrances and Intersections*. Should the turn-lane(s) be warranted, recommendations for storage length and taper length will be provided.

Traffic Operations Analysis

Based on discussions with VDOT, operational analyses for the study area intersections will be conducted using traffic analysis tools (e.g., *Synchro 11.1 Professional*, SimTraffic 11.1) and Highway Capacity Manual (HCM) methodologies. The future conditions analyses will confirm the need and define the geometric configurations necessary for the proposed roadway and intersection operational or capacity improvements (e.g., signal timing adjustments, exclusive turn-lane storage and taper, etc.).

Measures of effectiveness that will be reported for each scenario will consist of delay per vehicle, level of service (LOS), and maximum queue lengths. These measures of effectiveness will be presented in tables and figures. Vehicle delay and LOS will be summarized by movement, approach, and overall intersection, while maximum queue lengths will be summarized for each movement.

Reporting

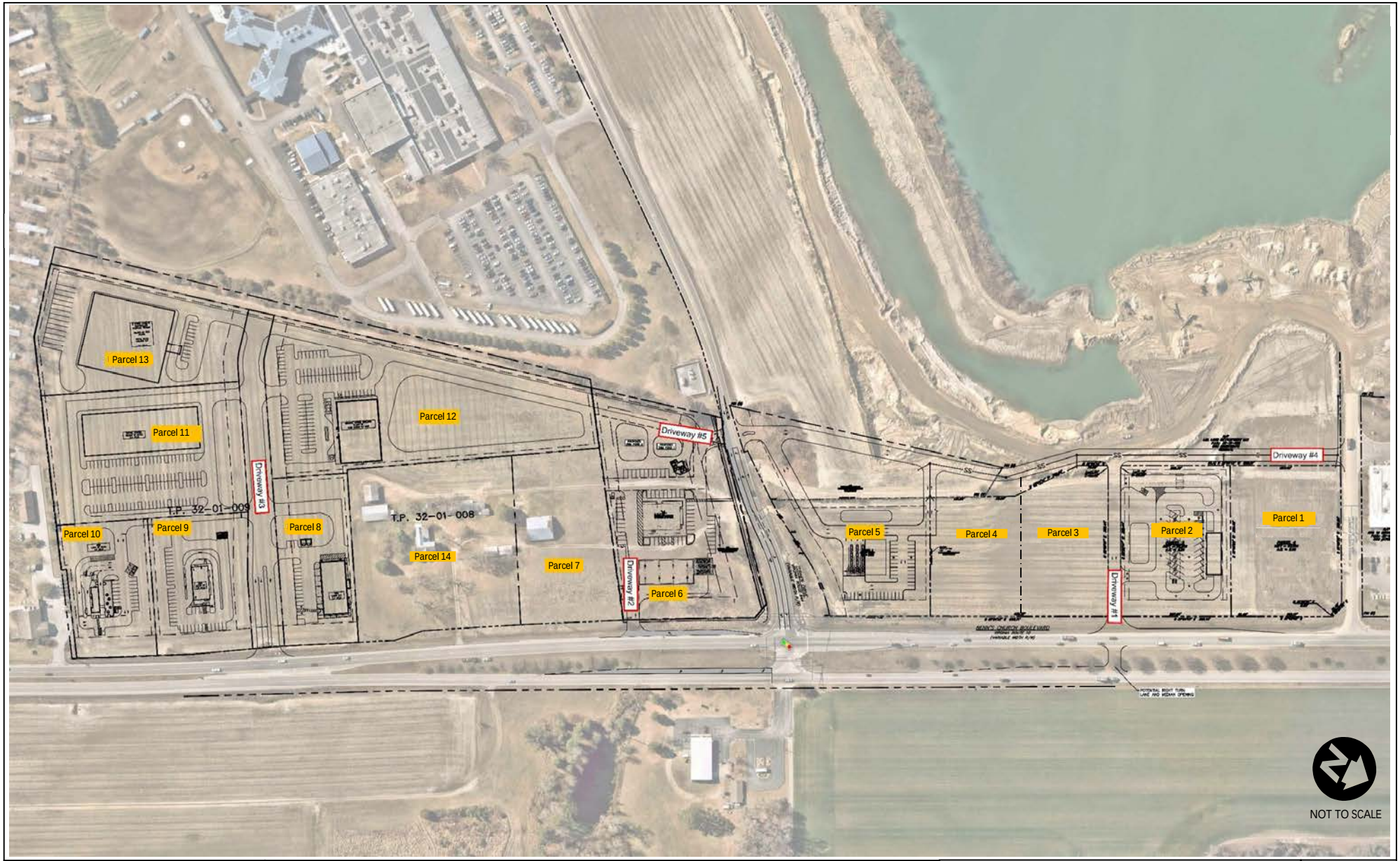
A TIA report with an accompanying technical appendix (including all analysis files) will be prepared that summarizes the analysis methodology and results. There will be two (2) electronic submittals of the technical report – DRAFT and FINAL (including supporting analytical files). Two rounds of comprehensive comments will be addressed with each report submittal through conference call. This study assumes that all deliverables will be electronic submittals (PDF report and all supporting analytical files).

Supporting Figures



Kimley»Horn	Benns Church TIA Isle of Wight, Virginia	Proposed Developments	Figure 1

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.



Kimley»Horn	Benns Church TIA Isle of Wight, Virginia	Conceptual Master Plan for Turner North and Turner South Parcels	Figure 2

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Study Area Intersections

1. Benns Church Blvd (U.S. Route 258/SR 10) at Cypress Run Drive
2. Benns Church Blvd (U.S. Route 258/SR 10) at Tractor Supply Entrance
3. Benns Church Blvd (U.S. Route 258/SR 10) at Turner Drive
4. Benns Church Blvd (U.S. Route 258/SR 10) at Red Oak Drive
5. Benns Church Blvd (U.S. Route 258/SR 10) at Site Driveway #1
6. Benns Church Blvd (U.S. Route 258/SR 10) at Site Driveway #2
7. Benns Church Blvd (U.S. Route 258/SR 10) at Site Driveway #3/Sweetgrass Driveway
8. Tractor Supply Entrance at Site Driveway #4
9. Turner Drive at Site Driveway #5
10. Tractor Supply Entrance at Site Driveway #6
11. Site Driveway #3 at Site Driveway #5
12. Benns Church Boulevard at Site Driveway #7

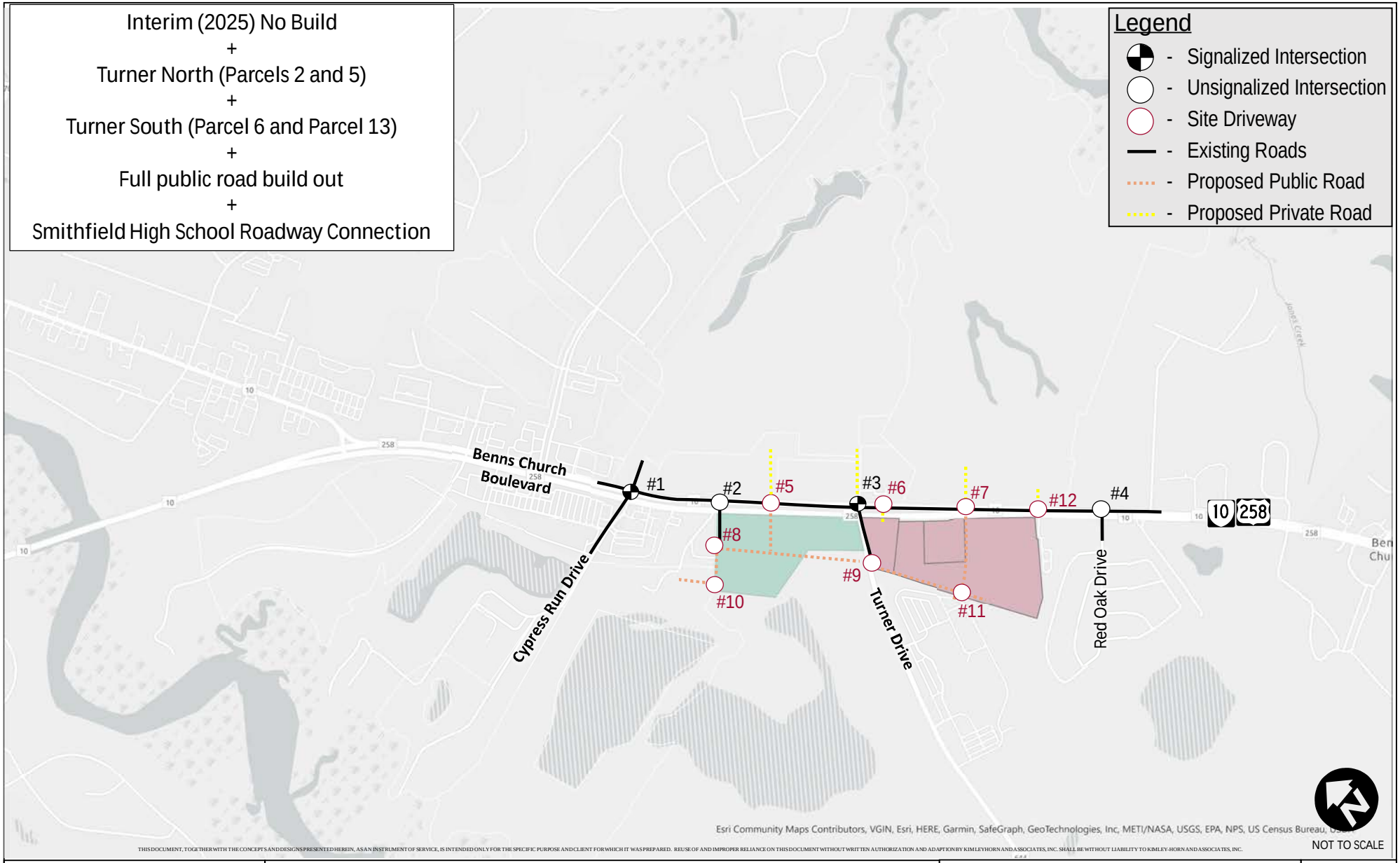
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Kimley»Horn	Benns Church TIA Isle of Wight, Virginia	Study Area	Figure 3

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Interim (2025) No Build
+
Turner North (Parcels 2 and 5)
+
Turner South (Parcel 6 and Parcel 13)
+
Full public road build out
+
Smithfield High School Roadway Connection



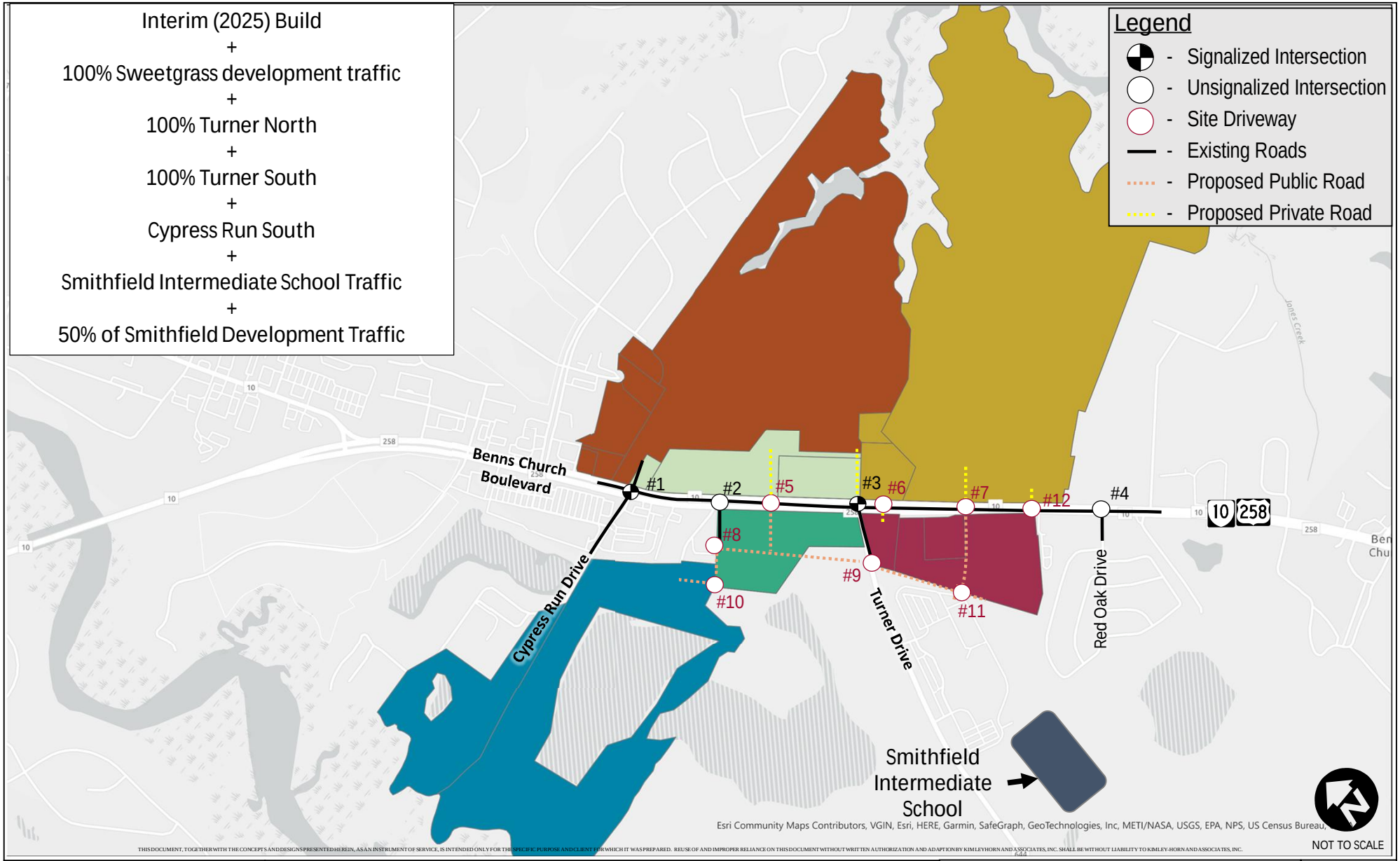
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Kimley»Horn	Benns Church TIA Isle of Wight, Virginia	Interim (2025) Build Conditions	Figure 4

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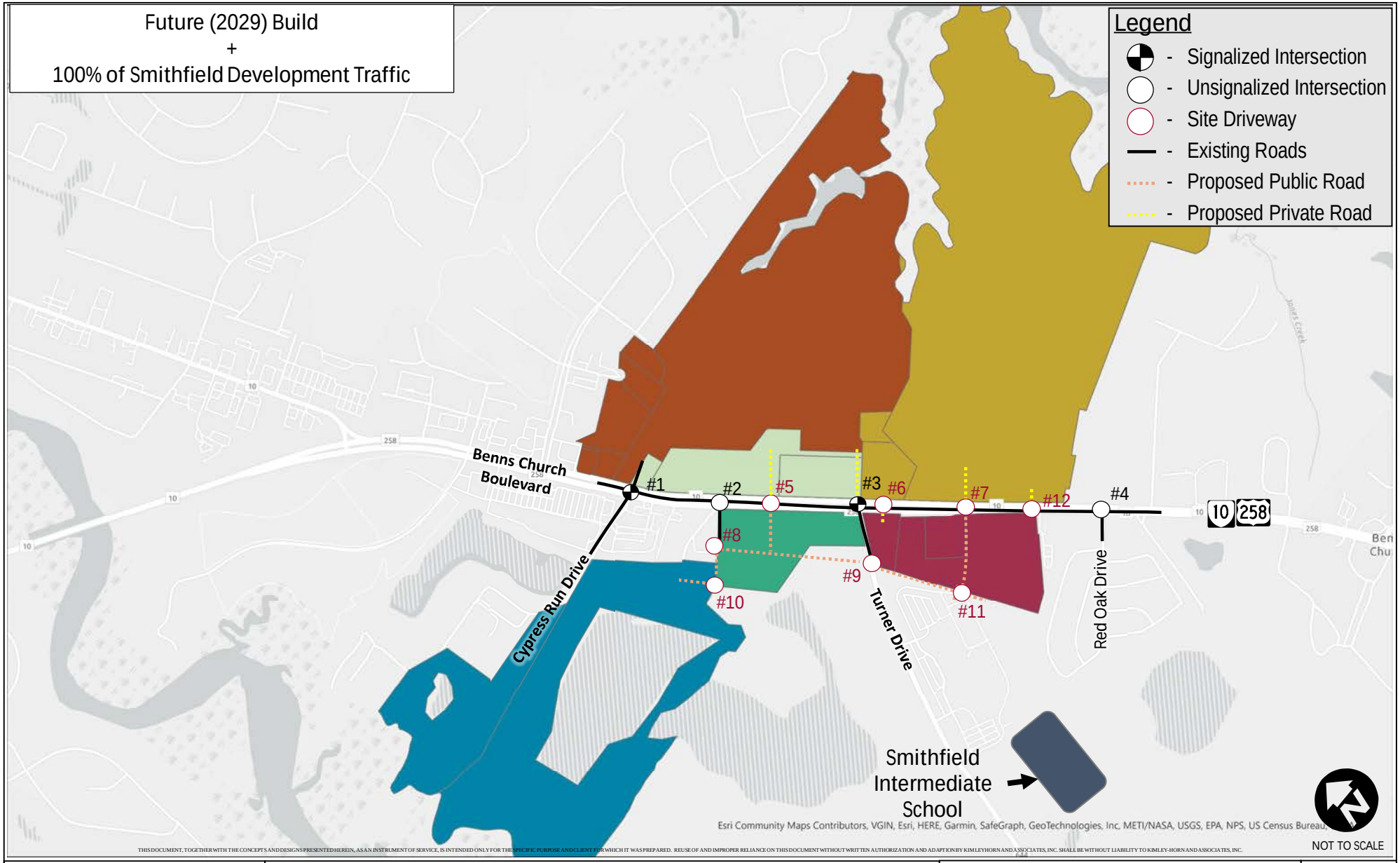
Interim (2025) Build
+
100% Sweetgrass development traffic
+
100% Turner North
+
100% Turner South
+
Cypress Run South
+
Smithfield Intermediate School Traffic
+
50% of Smithfield Development Traffic



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Kimley»Horn	Benns Church TIA Isle of Wight, Virginia	Future (2029) Build Conditions	Figure 5

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Kimley»Horn	Benns Church TIA Isle of Wight, Virginia	Horizon Year (2045) Build Conditions	Figure 6

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Appendix C
Detailed Synchro and SimTraffic Outputs

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	37	2	0	0	44	764	2	3	971	29
Future Volume (vph)	15	0	37	2	0	0	44	764	2	3	971	29
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950			0.950		0.950			0.950		
Satd. Flow (prot)	0	1492	1495	0	1203	0	1641	3374	0	1805	3471	1509
Flt Permitted		0.950					0.239			0.335		
Satd. Flow (perm)	0	1492	1495	0	1267	0	413	3374	0	636	3471	1509
Satd. Flow (RTOR)			182									168
Adj. Flow (vph)	16	0	39	2	0	0	46	796	2	3	1011	30
Lane Group Flow (vph)	0	16	39	0	2	0	46	798	0	3	1011	30
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Total Split (s)	20.0	20.0	20.0	15.0	15.0		19.0	76.0		14.0	71.0	71.0
Total Lost Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		7.6	7.6		7.1		96.3	101.0		103.4	92.0	92.0
Actuated g/C Ratio		0.06	0.06		0.06		0.77	0.81		0.83	0.74	0.74
v/c Ratio		0.18	0.15		0.03		0.12	0.29		0.01	0.40	0.03
Control Delay		60.1	1.2		56.5		4.6	6.0		4.3	9.8	0.0
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		60.1	1.2		56.5		4.6	6.0		4.3	9.8	0.0
LOS		E	A		E		A	A		A	A	A
Approach Delay		18.3			56.5			5.9			9.5	
Approach LOS		B			E			A			A	

Intersection Summary			
Cycle Length: 125			
Actuated Cycle Length: 125			
Offset: 15 (12%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 57.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	37	2	0	0	44	764	2	3	971	29
Future Volume (vph)	15	0	37	2	0	0	44	764	2	3	971	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.95		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1492	1495		1203		1641	3373		1805	3471	1509
Flt Permitted		0.95	1.00		1.00		0.24	1.00		0.34	1.00	1.00
Satd. Flow (perm)		1492	1495		1267		413	3373		637	3471	1509
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	16	0	39	2	0	0	46	796	2	3	1011	30
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	0	0	0	12
Lane Group Flow (vph)	0	16	2	0	2	0	46	798	0	3	1011	18
Heavy Vehicles (%)	21%	0%	8%	50%	0%	0%	10%	7%	0%	0%	4%	7%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Actuated Green, G (s)		6.2	6.2		1.5		86.6	85.6		86.6	76.5	76.5
Effective Green, g (s)		6.2	6.2		1.5		86.6	85.6		86.6	76.5	76.5
Actuated g/C Ratio		0.05	0.05		0.01		0.69	0.68		0.69	0.61	0.61
Clearance Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0		3.0		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		74	74		15		385	2309		450	2124	923
v/s Ratio Prot		c0.01					c0.01	c0.24		0.00	c0.29	
v/s Ratio Perm			0.00		c0.00		0.07			0.00		0.01
v/c Ratio		0.22	0.03		0.13		0.12	0.35		0.01	0.48	0.02
Uniform Delay, d1		57.1	56.5		61.1		11.2	8.1		7.1	13.3	9.5
Progression Factor		1.00	1.00		1.00		0.83	1.05		1.00	1.00	1.00
Incremental Delay, d2		1.5	0.1		4.0		0.0	0.4		0.0	0.8	0.0
Delay (s)		58.5	56.7		65.1		9.4	8.9		7.1	14.0	9.6
Level of Service		E	E		E		A	A		A	B	A
Approach Delay (s)		57.2			65.1			8.9			13.9	
Approach LOS		E			E			A			B	

Intersection Summary				
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	30.7	
Intersection Capacity Utilization	57.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	0	810	987	23
Future Volume (vph)	0	11	0	810	987	23
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3374	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3374	3471	1583
Adj. Flow (vph)	0	12	0	880	1073	25
Lane Group Flow (vph)	0	12	0	880	1073	25
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	11	0	810	987	23
Future Volume (Veh/h)	0	11	0	810	987	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	12	0	880	1073	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.84	0.84	0.84			
vC, conflicting volume	1513	536	1098			
vC1, stage 1 conf vol	1073					
vC2, stage 2 conf vol	440					
vCu, unblocked vol	1233	73	740			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	273	820	726			

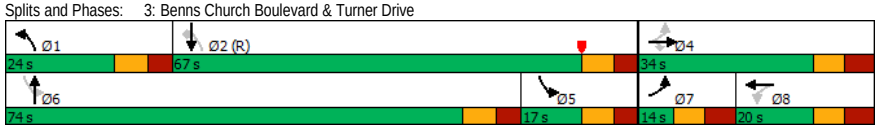
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	12	440	440	536	536	25
Volume Left	0	0	0	0	0	0
Volume Right	12	0	0	0	0	25
cSH	820	1700	1700	1700	1700	1700
Volume to Capacity	0.01	0.26	0.26	0.32	0.32	0.01
Queue Length 95th (ft)	1	0	0	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.5	0.0		0.0		
Approach LOS	A					

Intersection Summary					
Average Delay		0.1			
Intersection Capacity Utilization		37.3%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	0	267	2	0	2	243	626	0	4	762	232
Future Volume (vph)	182	0	267	2	0	2	243	626	0	4	762	232
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.932							0.850
Flt Protected		0.950			0.976		0.950			0.950		
Satd. Flow (prot)	0	1612	1524	0	1728	0	1719	3438	0	1805	3505	1538
Flt Permitted		0.755			0.863		0.225			0.329		
Satd. Flow (perm)	0	1281	1524	0	1528	0	407	3438	0	625	3505	1538
Satd. Flow (RTOR)			319		270							283
Adj. Flow (vph)	222	0	326	2	0	2	296	763	0	5	929	283
Lane Group Flow (vph)	0	222	326	0	4	0	296	763	0	5	929	283
Turn Type	pm+pt	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4			8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Total Split (s)	14.0	34.0	34.0	20.0	20.0		24.0	74.0		17.0	67.0	67.0
Total Lost Time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Act Effct Green (s)		25.0	25.0		25.0		74.4	79.3		81.0	59.9	59.9
Actuated g/C Ratio		0.20	0.20		0.20		0.60	0.63		0.65	0.48	0.48
v/c Ratio		0.87	0.58		0.01		0.75	0.35		0.01	0.55	0.32
Control Delay		79.6	9.6		0.0		24.4	12.1		2.2	19.8	6.1
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		79.6	9.6		0.0		24.4	12.1		2.2	19.8	6.1
LOS		E	A		A		C	B		A	B	A
Approach Delay		38.0						15.6			16.5	
Approach LOS		D						B			B	

Intersection Summary			
Cycle Length: 125			
Actuated Cycle Length: 125			
Offset: 49 (39%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 20.3		Intersection LOS: C	
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	0	267	2	0	2	243	626	0	4	762	232
Future Volume (vph)	182	0	267	2	0	2	243	626	0	4	762	232
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1612	1524		1729		1719	3438		1805	3505	1538
Flt Permitted		0.76	1.00		0.86		0.23	1.00		0.33	1.00	1.00
Satd. Flow (perm)		1281	1524		1529		408	3438		625	3505	1538
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	222	0	326	2	0	2	296	763	0	5	929	283
RTOR Reduction (vph)	0	0	255	0	3	0	0	0	0	0	0	147
Lane Group Flow (vph)	0	222	71	0	1	0	296	763	0	5	929	136
Heavy Vehicles (%)	12%	0%	6%	0%	0%	0%	5%	5%	0%	0%	3%	5%
Turn Type	pm+pt	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4			8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Actuated Green, G (s)		25.0	25.0		25.0		74.4	72.7		74.4	59.9	59.9
Effective Green, g (s)		25.0	25.0		25.0		74.4	72.7		74.4	59.9	59.9
Actuated g/C Ratio		0.20	0.20		0.20		0.60	0.58		0.60	0.48	0.48
Clearance Time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Vehicle Extension (s)		5.0	5.0		3.0		4.0	6.0		2.0	6.0	6.0
Lane Grp Cap (vph)		256	304		305		394	1999		388	1679	737
v/s Ratio Prot							c0.09	0.22		0.00	0.27	
v/s Ratio Perm		c0.17	0.05		0.00		c0.36			0.01		0.09
v/c Ratio		0.87	0.23		0.00		0.75	0.38		0.01	0.55	0.18
Uniform Delay, d1		48.4	42.0		40.0		14.6	14.1		13.2	23.1	18.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.30	0.79	2.38
Incremental Delay, d2		27.0	0.8		0.0		8.3	0.6		0.0	1.3	0.5
Delay (s)		75.3	42.8		40.0		22.9	14.6		4.0	19.4	44.8
Level of Service		E	D		D		C	B		A	B	D
Approach Delay (s)		56.0			40.0			16.9			25.3	
Approach LOS		E			D			B			C	

Intersection Summary					
HCM 2000 Control Delay		28.1	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.86			
Actuated Cycle Length (s)		125.0	Sum of lost time (s)		34.6
Intersection Capacity Utilization		72.6%	ICU Level of Service		C
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	19	12	858	1013	18
Future Volume (vph)	11	19	12	858	1013	18
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.914					0.850
Flt Protected	0.982		0.950			
Satd. Flow (prot)	1695	0	1787	3406	3471	1599
Flt Permitted	0.982		0.950			
Satd. Flow (perm)	1695	0	1787	3406	3471	1599
Adj. Flow (vph)	12	21	13	943	1113	20
Lane Group Flow (vph)	33	0	13	943	1113	20
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 38.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	19	12	858	1013	18
Future Volume (Veh/h)	11	19	12	858	1013	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	12	21	13	943	1113	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1610	556	1133			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1610	556	1133			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	96	98			
cM capacity (veh/h)	95	477	618			

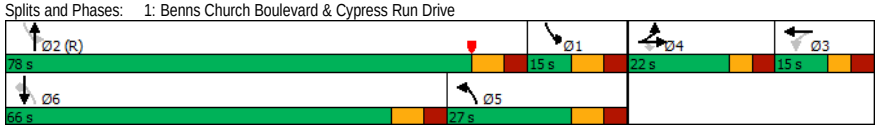
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	33	13	472	472	556	556	20
Volume Left	12	13	0	0	0	0	0
Volume Right	21	0	0	0	0	0	20
cSH	194	618	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.02	0.28	0.28	0.33	0.33	0.01
Queue Length 95th (ft)	15	2	0	0	0	0	0
Control Delay (s)	27.3	10.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B					
Approach Delay (s)	27.3	0.1			0.0		
Approach LOS	D						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	38.0%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	0	93	0	4	0	188	1141	0	3	1150	113
Future Volume (vph)	97	0	93	0	4	0	188	1141	0	3	1150	113
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1805	1615	0	1900	0	1805	3539	0	1805	3471	1553
Flt Permitted		0.950					0.156			0.200		
Satd. Flow (perm)	0	1805	1615	0	1900	0	296	3539	0	380	3471	1553
Satd. Flow (RTOR)			246									232
Adj. Flow (vph)	99	0	95	0	4	0	192	1164	0	3	1173	115
Lane Group Flow (vph)	0	99	95	0	4	0	192	1164	0	3	1173	115
Turn Type	Split	NA	Perm		NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Total Split (s)	22.0	22.0	22.0	15.0	15.0		27.0	78.0		15.0	66.0	66.0
Total Lost Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		12.2	12.2		7.0		91.4	97.0		101.7	80.2	80.2
Actuated g/C Ratio		0.09	0.09		0.05		0.70	0.75		0.78	0.62	0.62
v/c Ratio		0.59	0.25		0.04		0.57	0.44		0.01	0.55	0.11
Control Delay		69.8	1.6		59.2		17.5	4.2		6.0	17.9	0.2
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		69.8	1.6		59.2		17.5	4.2		6.0	17.9	0.2
LOS		E	A		E		B	A		A	B	A
Approach Delay		36.4			59.3			6.1			16.3	
Approach LOS		D			E			A			B	

Intersection Summary			
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 40 (31%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 12.9		Intersection LOS: B	
Intersection Capacity Utilization 73.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	0	93	0	4	0	188	1141	0	3	1150	113
Future Volume (vph)	97	0	93	0	4	0	188	1141	0	3	1150	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1805	1615		1900		1805	3539		1805	3471	1553
Flt Permitted		0.95	1.00		1.00		0.16	1.00		0.20	1.00	1.00
Satd. Flow (perm)		1805	1615		1900		296	3539		380	3471	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	99	0	95	0	4	0	192	1164	0	3	1173	115
RTOR Reduction (vph)	0	0	86	0	0	0	0	0	0	0	0	55
Lane Group Flow (vph)	0	99	9	0	4	0	192	1164	0	3	1173	60
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	4%
Turn Type	Split	NA	Perm		NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Actuated Green, G (s)		12.2	12.2		1.4		85.7	84.6		85.7	67.8	67.8
Effective Green, g (s)		12.2	12.2		1.4		85.7	84.6		85.7	67.8	67.8
Actuated g/C Ratio		0.09	0.09		0.01		0.66	0.65		0.66	0.52	0.52
Clearance Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0		3.0		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		169	151		20		402	2303		262	1810	809
v/s Ratio Prot		c0.05			c0.00		c0.07	0.33		0.00	c0.34	
v/s Ratio Perm			0.01				0.25			0.01		0.04
v/c Ratio		0.59	0.06		0.20		0.48	0.51		0.01	0.65	0.07
Uniform Delay, d1		56.5	53.7		63.7		29.7	11.8		13.6	22.5	15.5
Progression Factor		1.00	1.00		1.00		0.71	0.44		1.00	1.00	1.00
Incremental Delay, d2		5.1	0.2		4.9		0.3	0.7		0.0	1.8	0.2
Delay (s)		61.6	53.8		68.6		21.3	5.9		13.6	24.3	15.7
Level of Service		E	D		E		C	A		B	C	B
Approach Delay (s)		57.8			68.6			8.1			23.5	
Approach LOS		E			E			A			C	

Intersection Summary					
HCM 2000 Control Delay		18.6	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.60			
Actuated Cycle Length (s)		130.0	Sum of lost time (s)		30.7
Intersection Capacity Utilization		73.9%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	13	0	1329	1231	12
Future Volume (vph)	0	13	0	1329	1231	12
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3471	1583
Adj. Flow (vph)	0	14	0	1445	1338	13
Lane Group Flow (vph)	0	14	0	1445	1338	13
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	13	0	1329	1231	12
Future Volume (Veh/h)	0	13	0	1329	1231	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	14	0	1445	1338	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	2060	669	1351			
vC1, stage 1 conf vol	1338					
vC2, stage 2 conf vol	722					
vCu, unblocked vol	1751	0	807			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	191	815	612			

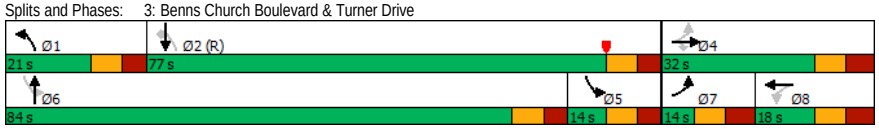
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	14	722	722	669	669	13
Volume Left	0	0	0	0	0	0
Volume Right	14	0	0	0	0	13
cSH	815	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.42	0.42	0.39	0.39	0.01
Queue Length 95th (ft)	1	0	0	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.5	0.0		0.0		
Approach LOS	A					

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization	44.0%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	2	128	3	0	8	200	1195	4	28	1063	153
Future Volume (vph)	126	2	128	3	0	8	200	1195	4	28	1063	153
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.902							0.850
Flt Protected		0.953			0.987		0.950			0.950		
Satd. Flow (prot)	0	1793	1599	0	1692	0	1719	3539	0	1805	3539	1615
Flt Permitted		0.722			0.914		0.185			0.163		
Satd. Flow (perm)	0	1358	1599	0	1566	0	335	3539	0	310	3539	1615
Satd. Flow (RTOR)			184		259							196
Adj. Flow (vph)	133	2	135	3	0	8	211	1258	4	29	1119	161
Lane Group Flow (vph)	0	135	135	0	11	0	211	1262	0	29	1119	161
Turn Type	pm+pt	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4			8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Total Split (s)	14.0	32.0	32.0	18.0	18.0		21.0	84.0		14.0	77.0	77.0
Total Lost Time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Act Effct Green (s)		20.8	20.8		20.8		83.6	83.5		87.0	72.3	72.3
Actuated g/C Ratio		0.16	0.16		0.16		0.64	0.64		0.67	0.56	0.56
v/c Ratio		0.62	0.33		0.02		0.63	0.55		0.11	0.57	0.16
Control Delay		63.6	4.1		0.1		17.1	15.5		9.4	13.6	2.1
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		63.6	4.1		0.1		17.1	15.5		9.4	13.6	2.1
LOS		E	A		A		B	B		A	B	A
Approach Delay		33.9			0.1			15.8			12.1	
Approach LOS		C			A			B			B	

Intersection Summary			
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 38 (29%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	2	128	3	0	8	200	1195	4	28	1063	153
Future Volume (vph)	126	2	128	3	0	8	200	1195	4	28	1063	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1793	1599		1690		1719	3538		1805	3539	1615
Flt Permitted		0.72	1.00		0.91		0.18	1.00		0.16	1.00	1.00
Satd. Flow (perm)		1358	1599		1566		334	3538		310	3539	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	133	2	135	3	0	8	211	1258	4	29	1119	161
RTOR Reduction (vph)	0	0	113	0	9	0	0	0	0	0	0	72
Lane Group Flow (vph)	0	135	22	0	2	0	211	1262	0	29	1119	89
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	5%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4			8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Actuated Green, G (s)		20.8	20.8		20.8		83.6	80.2		83.6	72.2	72.2
Effective Green, g (s)		20.8	20.8		20.8		83.6	80.2		83.6	72.2	72.2
Actuated g/C Ratio		0.16	0.16		0.16		0.64	0.62		0.64	0.56	0.56
Clearance Time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Vehicle Extension (s)		5.0	5.0		3.0		4.0	6.0		2.0	6.0	6.0
Lane Grp Cap (vph)		217	255		250		336	2182		238	1965	896
v/s Ratio Prot							0.06	c0.36		0.00	0.32	
v/s Ratio Perm		c0.10	0.01		0.00		c0.35			0.07		0.06
v/c Ratio		0.62	0.08		0.01		0.63	0.58		0.12	0.57	0.10
Uniform Delay, d1		50.9	46.5		45.9		12.2	14.8		18.7	18.8	13.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.15	0.64	1.89
Incremental Delay, d2		7.6	0.3		0.0		4.1	1.1		0.1	1.1	0.2
Delay (s)		58.6	46.8		45.9		16.4	16.0		21.5	13.1	25.9
Level of Service		E	D		D		B	B		C	B	C
Approach Delay (s)		52.7			45.9			16.0			14.9	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	34.6	
Intersection Capacity Utilization	75.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	15	28	1390	1173	21
Future Volume (vph)	9	15	28	1390	1173	21
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.914					0.850
Flt Protected	0.982		0.950			
Satd. Flow (prot)	1705	0	1736	3539	3505	1615
Flt Permitted	0.982		0.950			
Satd. Flow (perm)	1705	0	1736	3539	3505	1615
Adj. Flow (vph)	9	16	29	1448	1222	22
Lane Group Flow (vph)	25	0	29	1448	1222	22
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 48.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	15	28	1390	1173	21
Future Volume (Veh/h)	9	15	28	1390	1173	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	16	29	1448	1222	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2004	611	1244			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2004	611	1244			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	96	95			
cM capacity (veh/h)	50	442	545			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	29	724	724	611	611	22
Volume Left	9	29	0	0	0	0	0
Volume Right	16	0	0	0	0	0	22
cSH	116	545	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.05	0.43	0.43	0.36	0.36	0.01
Queue Length 95th (ft)	19	4	0	0	0	0	0
Control Delay (s)	44.3	12.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	B					
Approach Delay (s)	44.3	0.2			0.0		
Approach LOS	E						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	48.4%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	67	64	35	73	136	157	24	182	195	53
Average Queue (ft)	14	16	3	20	26	38	2	52	53	6
95th Queue (ft)	47	42	18	52	87	110	11	135	147	35
Link Distance (ft)	656		676		798	798		1702	1702	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		180		255			150			245
Storage Blk Time (%)					0			0	0	0
Queuing Penalty (veh)					0			0	0	0

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	7
95th Queue (ft)	25
Link Distance (ft)	693
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	324	265	33	130	366	277	62	291	312	240
Average Queue (ft)	148	85	4	96	110	90	4	137	143	64
95th Queue (ft)	262	184	20	150	293	210	30	237	247	153
Link Distance (ft)	1966		472		2308	2308		1320	1320	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		305		130			140			280
Storage Blk Time (%)	0	0		14	7		0	7	0	0
Queuing Penalty (veh)	1	0		48	19		0	0	1	0

Intersection: 4: Red Oak Drive & Benns Church Boulevard

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	48	31
Average Queue (ft)	16	5
95th Queue (ft)	38	23
Link Distance (ft)	949	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 69

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	178	132	28	215	177	185	58	304	310	206
Average Queue (ft)	84	32	4	104	61	75	4	169	160	33
95th Queue (ft)	147	79	17	189	136	140	32	273	273	110
Link Distance (ft)	656		676		798	798		1702	1702	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		180		255			150			245
Storage Blk Time (%)	0	0		0	0		0	8	1	0
Queuing Penalty (veh)	0	0		1	0		0	0	1	0

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	8
95th Queue (ft)	27
Link Distance (ft)	693
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	213	109	37	130	331	299	104	260	258	129
Average Queue (ft)	101	43	9	96	148	142	25	122	130	33
95th Queue (ft)	181	85	32	152	291	261	74	206	209	84
Link Distance (ft)	1966		472		2308	2308		1320	1320	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		305		130			140			280
Storage Blk Time (%)				8	6		0	7	0	0
Queuing Penalty (veh)				51	12		0	2	0	0

Intersection: 4: Red Oak Drive & Benns Church Boulevard

Movement	EB	NB	SB
Directions Served	LR	L	R
Maximum Queue (ft)	48	53	2
Average Queue (ft)	16	14	0
95th Queue (ft)	41	41	2
Link Distance (ft)	949		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		200	140
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 69

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	38	2	0	0	45	787	2	3	1000	30
Future Volume (vph)	15	0	38	2	0	0	45	787	2	3	1000	30
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950			0.950		0.950			0.950		
Satd. Flow (prot)	0	1492	1495	0	1203	0	1641	3374	0	1805	3471	1509
Flt Permitted		0.950					0.229			0.326		
Satd. Flow (perm)	0	1492	1495	0	1267	0	396	3374	0	619	3471	1509
Satd. Flow (RTOR)			182									168
Adj. Flow (vph)	16	0	40	2	0	0	47	820	2	3	1042	31
Lane Group Flow (vph)	0	16	40	0	2	0	47	822	0	3	1042	31
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Total Split (s)	20.0	20.0	20.0	15.0	15.0		19.0	76.0		14.0	71.0	71.0
Total Lost Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		7.6	7.6		7.1		96.3	101.0		103.4	92.0	92.0
Actuated g/C Ratio		0.06	0.06		0.06		0.77	0.81		0.83	0.74	0.74
v/c Ratio		0.18	0.15		0.03		0.13	0.30		0.01	0.41	0.03
Control Delay		60.1	1.2		56.5		4.7	5.8		4.3	9.9	0.0
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		60.1	1.2		56.5		4.7	5.8		4.3	9.9	0.0
LOS		E	A		E		A	A		A	A	A
Approach Delay		18.0			56.5			5.8			9.6	
Approach LOS		B			E			A			A	

Intersection Summary			
Cycle Length: 125			
Actuated Cycle Length: 125			
Offset: 15 (12%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 57.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	38	2	0	0	45	787	2	3	1000	30
Future Volume (vph)	15	0	38	2	0	0	45	787	2	3	1000	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.95		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1492	1495		1203		1641	3373		1805	3471	1509
Flt Permitted		0.95	1.00		1.00		0.23	1.00		0.33	1.00	1.00
Satd. Flow (perm)		1492	1495		1267		395	3373		619	3471	1509
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	16	0	40	2	0	0	47	820	2	3	1042	31
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	0	0	0	12
Lane Group Flow (vph)	0	16	2	0	2	0	47	822	0	3	1042	19
Heavy Vehicles (%)	21%	0%	8%	50%	0%	0%	10%	7%	0%	0%	4%	7%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Actuated Green, G (s)		6.2	6.2		1.5		86.6	85.6		86.6	76.5	76.5
Effective Green, g (s)		6.2	6.2		1.5		86.6	85.6		86.6	76.5	76.5
Actuated g/C Ratio		0.05	0.05		0.01		0.69	0.68		0.69	0.61	0.61
Clearance Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0		3.0		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		74	74		15		374	2309		438	2124	923
v/s Ratio Prot		c0.01					c0.01	c0.24		0.00	c0.30	
v/s Ratio Perm			0.00		c0.00		0.08			0.00		0.01
v/c Ratio		0.22	0.03		0.13		0.13	0.36		0.01	0.49	0.02
Uniform Delay, d1		57.1	56.5		61.1		11.7	8.2		7.2	13.4	9.5
Progression Factor		1.00	1.00		1.00		0.83	1.01		1.00	1.00	1.00
Incremental Delay, d2		1.5	0.1		4.0		0.1	0.4		0.0	0.8	0.0
Delay (s)		58.5	56.7		65.1		9.7	8.7		7.2	14.3	9.6
Level of Service		E	E		E		A	A		A	B	A
Approach Delay (s)		57.2			65.1			8.7			14.1	
Approach LOS		E			E			A			B	

Intersection Summary				
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	30.7	
Intersection Capacity Utilization	57.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	0	835	1017	24
Future Volume (vph)	0	11	0	835	1017	24
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3374	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3374	3471	1583
Adj. Flow (vph)	0	12	0	908	1105	26
Lane Group Flow (vph)	0	12	0	908	1105	26
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	11	0	835	1017	24
Future Volume (Veh/h)	0	11	0	835	1017	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	12	0	908	1105	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	1559	552	1131			
vC1, stage 1 conf vol	1105					
vC2, stage 2 conf vol	454					
vCu, unblocked vol	1272	65	759			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	264	821	707			

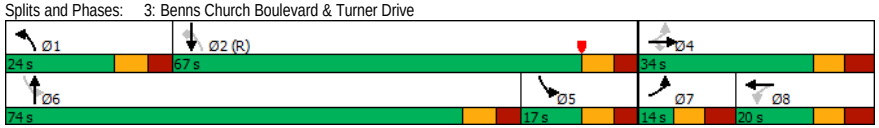
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	12	454	454	552	552	26
Volume Left	0	0	0	0	0	0
Volume Right	12	0	0	0	0	26
cSH	821	1700	1700	1700	1700	1700
Volume to Capacity	0.01	0.27	0.27	0.33	0.33	0.02
Queue Length 95th (ft)	1	0	0	0	0	0
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.4	0.0		0.0		
Approach LOS	A					

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	38.1%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	0	275	2	0	2	250	645	0	4	785	239
Future Volume (vph)	188	0	275	2	0	2	250	645	0	4	785	239
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.932							0.850
Flt Protected		0.950			0.976		0.950			0.950		
Satd. Flow (prot)	0	1612	1524	0	1728	0	1719	3438	0	1805	3505	1538
Flt Permitted		0.755			0.863		0.244			0.343		
Satd. Flow (perm)	0	1281	1524	0	1528	0	442	3438	0	652	3505	1538
Satd. Flow (RTOR)			313		270							272
Adj. Flow (vph)	214	0	313	2	0	2	284	733	0	5	892	272
Lane Group Flow (vph)	0	214	313	0	4	0	284	733	0	5	892	272
Turn Type	pm+pt	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4			8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Total Split (s)	14.0	34.0	34.0	20.0	20.0		24.0	74.0		17.0	67.0	67.0
Total Lost Time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Act Effct Green (s)		24.6	24.6		24.6		74.8	79.7		81.4	60.7	60.7
Actuated g/C Ratio		0.20	0.20		0.20		0.60	0.64		0.65	0.49	0.49
v/c Ratio		0.85	0.57		0.01		0.70	0.33		0.01	0.52	0.31
Control Delay		77.3	9.0		0.0		19.8	11.9		1.8	18.3	6.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		77.3	9.0		0.0		19.8	11.9		1.8	18.3	6.3
LOS		E	A		A		B	B		A	B	A
Approach Delay		36.7						14.1			15.5	
Approach LOS		D						B			B	

Intersection Summary		
Cycle Length: 125		
Actuated Cycle Length: 125		
Offset: 49 (39%), Referenced to phase 2:NBSB, Start of Yellow		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.85		
Intersection Signal Delay: 19.0	Intersection LOS: B	
Intersection Capacity Utilization 74.0%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	0	275	2	0	2	250	645	0	4	785	239
Future Volume (vph)	188	0	275	2	0	2	250	645	0	4	785	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1612	1524		1729		1719	3438		1805	3505	1538
Flt Permitted		0.76	1.00		0.86		0.24	1.00		0.34	1.00	1.00
Satd. Flow (perm)		1281	1524		1530		441	3438		652	3505	1538
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	214	0	312	2	0	2	284	733	0	5	892	272
RTOR Reduction (vph)	0	0	251	0	3	0	0	0	0	0	0	140
Lane Group Flow (vph)	0	214	62	0	1	0	284	733	0	5	892	132
Heavy Vehicles (%)	12%	0%	6%	0%	0%	0%	5%	5%	0%	0%	3%	5%
Turn Type	pm+pt	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4			8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Actuated Green, G (s)		24.6	24.6		24.6		74.8	73.1		74.8	60.8	60.8
Effective Green, g (s)		24.6	24.6		24.6		74.8	73.1		74.8	60.8	60.8
Actuated g/C Ratio		0.20	0.20		0.20		0.60	0.58		0.60	0.49	0.49
Clearance Time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Vehicle Extension (s)		5.0	5.0		3.0		4.0	6.0		2.0	6.0	6.0
Lane Grp Cap (vph)		252	299		301		407	2010		405	1704	748
v/s Ratio Prot							c0.08	0.21		0.00	0.25	
v/s Ratio Perm		c0.17	0.04		0.00		c0.34			0.01		0.09
v/c Ratio		0.85	0.21		0.00		0.70	0.36		0.01	0.52	0.18
Uniform Delay, d1		48.4	42.0		40.3		13.7	13.7		12.7	22.1	18.0
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.22	0.76	2.46
Incremental Delay, d2		24.5	0.7		0.0		5.6	0.5		0.0	1.1	0.5
Delay (s)		72.9	42.7		40.3		19.3	14.2		2.8	17.8	44.8
Level of Service		E	D		D		B	B		A	B	D
Approach Delay (s)		55.0			40.3			15.6			24.0	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	34.6	
Intersection Capacity Utilization	74.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	20	12	884	1044	19
Future Volume (vph)	11	20	12	884	1044	19
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.913					0.850
Flt Protected	0.983		0.950			
Satd. Flow (prot)	1694	0	1787	3406	3471	1599
Flt Permitted	0.983		0.950			
Satd. Flow (perm)	1694	0	1787	3406	3471	1599
Adj. Flow (vph)	12	22	13	971	1147	21
Lane Group Flow (vph)	34	0	13	971	1147	21
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 38.9%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	20	12	884	1044	19
Future Volume (Veh/h)	11	20	12	884	1044	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	12	22	13	971	1147	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1658	574	1168			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1658	574	1168			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	95	98			
cM capacity (veh/h)	88	465	600			

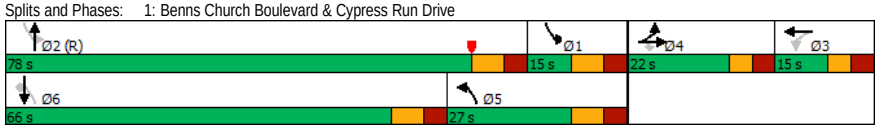
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	13	486	486	574	574	21
Volume Left	12	13	0	0	0	0	0
Volume Right	22	0	0	0	0	0	21
cSH	186	600	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.02	0.29	0.29	0.34	0.34	0.01
Queue Length 95th (ft)	16	2	0	0	0	0	0
Control Delay (s)	28.7	11.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B					
Approach Delay (s)	28.7	0.1			0.0		
Approach LOS	D						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	38.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	0	96	0	4	0	194	1176	0	3	1185	116
Future Volume (vph)	100	0	96	0	4	0	194	1176	0	3	1185	116
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1805	1615	0	1900	0	1805	3539	0	1805	3471	1553
Flt Permitted		0.950					0.142			0.190		
Satd. Flow (perm)	0	1805	1615	0	1900	0	270	3539	0	361	3471	1553
Satd. Flow (RTOR)			246									232
Adj. Flow (vph)	102	0	98	0	4	0	198	1200	0	3	1209	118
Lane Group Flow (vph)	0	102	98	0	4	0	198	1200	0	3	1209	118
Turn Type	Split	NA	Perm		NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Total Split (s)	22.0	22.0	22.0	15.0	15.0		27.0	78.0		15.0	66.0	66.0
Total Lost Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		12.2	12.2		7.0		91.4	96.8		101.5	79.4	79.4
Actuated g/C Ratio		0.09	0.09		0.05		0.70	0.74		0.78	0.61	0.61
v/c Ratio		0.60	0.26		0.04		0.60	0.46		0.01	0.57	0.11
Control Delay		71.2	1.7		59.2		19.6	4.2		6.0	18.8	0.2
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		71.2	1.7		59.2		19.6	4.2		6.0	18.8	0.2
LOS		E	A		E		B	A		A	B	A
Approach Delay		37.1			59.3			6.4			17.1	
Approach LOS		D			E			A			B	

Intersection Summary			
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 40 (31%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 13.4		Intersection LOS: B	
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	0	96	0	4	0	194	1176	0	3	1185	116
Future Volume (vph)	100	0	96	0	4	0	194	1176	0	3	1185	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1805	1615		1900		1805	3539		1805	3471	1553
Flt Permitted		0.95	1.00		1.00		0.14	1.00		0.19	1.00	1.00
Satd. Flow (perm)		1805	1615		1900		270	3539		360	3471	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	0	98	0	4	0	198	1200	0	3	1209	118
RTOR Reduction (vph)	0	0	89	0	0	0	0	0	0	0	0	57
Lane Group Flow (vph)	0	102	9	0	4	0	198	1200	0	3	1209	61
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	4%
Turn Type	Split	NA	Perm		NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Actuated Green, G (s)		12.2	12.2		1.4		85.7	84.4		85.7	67.0	67.0
Effective Green, g (s)		12.2	12.2		1.4		85.7	84.4		85.7	67.0	67.0
Actuated g/C Ratio		0.09	0.09		0.01		0.66	0.65		0.66	0.52	0.52
Clearance Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0		3.0		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		169	151		20		398	2297		251	1788	800
v/s Ratio Prot		c0.06			c0.00		c0.07	0.34		0.00	c0.35	
v/s Ratio Perm			0.01				0.26			0.01		0.04
v/c Ratio		0.60	0.06		0.20		0.50	0.52		0.01	0.68	0.08
Uniform Delay, d1		56.6	53.7		63.7		30.5	12.1		14.2	23.4	15.9
Progression Factor		1.00	1.00		1.00		0.70	0.43		1.00	1.00	1.00
Incremental Delay, d2		6.0	0.2		4.9		0.3	0.7		0.0	2.1	0.2
Delay (s)		62.5	53.8		68.6		21.6	5.9		14.2	25.5	16.1
Level of Service		E	D		E		C	A		B	C	B
Approach Delay (s)		58.3			68.6			8.1			24.6	
Approach LOS		E			E			A			C	

Intersection Summary					
HCM 2000 Control Delay		19.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio		0.63			
Actuated Cycle Length (s)		130.0	Sum of lost time (s)	30.7	
Intersection Capacity Utilization		75.4%	ICU Level of Service	D	
Analysis Period (min)		15			
c Critical Lane Group					



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	13	0	1369	1268	12
Future Volume (vph)	0	13	0	1369	1268	12
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3471	1583
Adj. Flow (vph)	0	14	0	1488	1378	13
Lane Group Flow (vph)	0	14	0	1488	1378	13
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	13	0	1369	1268	12
Future Volume (Veh/h)	0	13	0	1369	1268	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	14	0	1488	1378	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.74	0.74	0.74			
vC, conflicting volume	2122	689	1391			
vC1, stage 1 conf vol	1378					
vC2, stage 2 conf vol	744					
vCu, unblocked vol	1808	0	815			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	183	798	595			

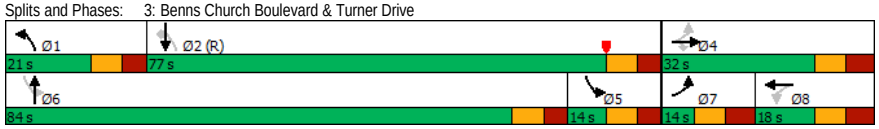
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	14	744	744	689	689	13
Volume Left	0	0	0	0	0	0
Volume Right	14	0	0	0	0	13
cSH	798	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.44	0.44	0.41	0.41	0.01
Queue Length 95th (ft)	1	0	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.6	0.0		0.0		
Approach LOS	A					

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization	45.1%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	2	132	3	0	8	206	1231	4	29	1095	158
Future Volume (vph)	130	2	132	3	0	8	206	1231	4	29	1095	158
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.902							0.850
Flt Protected		0.953			0.987		0.950			0.950		
Satd. Flow (prot)	0	1793	1599	0	1692	0	1719	3539	0	1805	3539	1615
Flt Permitted		0.722			0.914		0.173			0.153		
Satd. Flow (perm)	0	1358	1599	0	1566	0	313	3539	0	291	3539	1615
Satd. Flow (RTOR)			184		259							196
Adj. Flow (vph)	137	2	139	3	0	8	217	1296	4	31	1153	166
Lane Group Flow (vph)	0	139	139	0	11	0	217	1300	0	31	1153	166
Turn Type	pm+pt	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4			8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Total Split (s)	14.0	32.0	32.0	18.0	18.0		21.0	84.0		14.0	77.0	77.0
Total Lost Time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Act Effct Green (s)		21.0	21.0		21.0		83.4	83.3		86.8	72.0	72.0
Actuated g/C Ratio		0.16	0.16		0.16		0.64	0.64		0.67	0.55	0.55
v/c Ratio		0.63	0.34		0.02		0.67	0.57		0.12	0.59	0.17
Control Delay		64.2	4.5		0.1		20.4	15.9		9.9	14.0	2.4
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		64.2	4.5		0.1		20.4	15.9		9.9	14.0	2.4
LOS		E	A		A		C	B		A	B	A
Approach Delay		34.4			0.1			16.6			12.5	
Approach LOS		C			A			B			B	

Intersection Summary			
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 38 (29%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 77.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	2	132	3	0	8	206	1231	4	29	1095	158
Future Volume (vph)	130	2	132	3	0	8	206	1231	4	29	1095	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1793	1599		1690		1719	3538		1805	3539	1615
Flt Permitted		0.72	1.00		0.91		0.17	1.00		0.15	1.00	1.00
Satd. Flow (perm)		1358	1599		1565		314	3538		291	3539	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	2	139	3	0	8	217	1296	4	31	1153	166
RTOR Reduction (vph)	0	0	117	0	9	0	0	0	0	0	0	74
Lane Group Flow (vph)	0	139	22	0	2	0	217	1300	0	31	1153	92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	5%	2%	0%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4			8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Actuated Green, G (s)		21.0	21.0		21.0		83.4	80.0		83.4	71.9	71.9
Effective Green, g (s)		21.0	21.0		21.0		83.4	80.0		83.4	71.9	71.9
Actuated g/C Ratio		0.16	0.16		0.16		0.64	0.62		0.64	0.55	0.55
Clearance Time (s)		9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Vehicle Extension (s)		5.0	5.0		3.0		4.0	6.0		2.0	6.0	6.0
Lane Grp Cap (vph)		219	258		252		325	2177		226	1957	893
v/s Ratio Prot							0.06	c0.37		0.00	0.33	
v/s Ratio Perm		c0.10	0.01		0.00		c0.37			0.08		0.06
v/c Ratio		0.63	0.09		0.01		0.67	0.60		0.14	0.59	0.10
Uniform Delay, d1		50.9	46.3		45.7		12.9	15.2		19.8	19.3	13.8
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.16	0.64	1.84
Incremental Delay, d2		8.1	0.3		0.0		5.6	1.2		0.1	1.1	0.2
Delay (s)		59.0	46.7		45.8		18.6	16.4		23.2	13.5	25.6
Level of Service		E	D		D		B	B		C	B	C
Approach Delay (s)		52.8			45.8			16.7			15.2	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	34.6	
Intersection Capacity Utilization	77.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	15	29	1432	1209	22
Future Volume (vph)	9	15	29	1432	1209	22
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.914					0.850
Flt Protected	0.982		0.950			
Satd. Flow (prot)	1705	0	1736	3539	3505	1615
Flt Permitted	0.982		0.950			
Satd. Flow (perm)	1705	0	1736	3539	3505	1615
Adj. Flow (vph)	9	16	30	1492	1259	23
Lane Group Flow (vph)	25	0	30	1492	1259	23
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 49.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	15	29	1432	1209	22
Future Volume (Veh/h)	9	15	29	1432	1209	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	16	30	1492	1259	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2065	630	1282			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2065	630	1282			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	96	94			
cM capacity (veh/h)	46	430	526			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	30	746	746	630	630	23
Volume Left	9	30	0	0	0	0	0
Volume Right	16	0	0	0	0	0	23
cSH	106	526	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.06	0.44	0.44	0.37	0.37	0.01
Queue Length 95th (ft)	21	5	0	0	0	0	0
Control Delay (s)	48.9	12.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	B					
Approach Delay (s)	48.9	0.2			0.0		
Approach LOS	E						

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	49.6%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	78	64	45	72	116	134	22	158	159	41
Average Queue (ft)	15	17	3	24	26	37	1	53	51	6
95th Queue (ft)	51	42	22	54	80	101	11	118	122	26
Link Distance (ft)	656		676		798	798		1702	1702	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		180		255			150			245
Storage Blk Time (%)								0		
Queuing Penalty (veh)								0		

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB
Directions Served	R
Maximum Queue (ft)	27
Average Queue (ft)	7
95th Queue (ft)	24
Link Distance (ft)	693
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	322	261	35	130	291	214	63	272	277	204
Average Queue (ft)	152	85	4	101	95	86	5	145	151	59
95th Queue (ft)	262	186	21	148	227	168	32	235	244	134
Link Distance (ft)	1966		472		2308	2308		1320	1320	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		305		130			140			280
Storage Blk Time (%)	0	0		10	3		0	8	0	0
Queuing Penalty (veh)	1	0		35	8		0	0	0	0

Intersection: 4: Red Oak Drive & Benns Church Boulevard

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	55	34
Average Queue (ft)	17	6
95th Queue (ft)	42	26
Link Distance (ft)	949	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 45

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	161	117	23	214	186	193	48	294	300	194
Average Queue (ft)	73	33	3	105	68	80	3	165	155	36
95th Queue (ft)	138	78	16	188	157	156	26	272	267	123
Link Distance (ft)	656		676		798	798		1702	1702	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		180		255			150			245
Storage Blk Time (%)	0	0		0	0			8	1	0
Queuing Penalty (veh)	0	0		3	0			0	1	0

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB	SB
Directions Served	R	T
Maximum Queue (ft)	31	5
Average Queue (ft)	8	0
95th Queue (ft)	27	5
Link Distance (ft)	693	798
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	191	110	44	130	363	330	131	222	239	90
Average Queue (ft)	94	42	10	100	158	154	25	129	139	33
95th Queue (ft)	165	84	35	154	315	286	79	206	215	72
Link Distance (ft)	1966		472		2308	2308		1320	1320	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		305		130			140			280
Storage Blk Time (%)				11	7		0	8	0	0
Queuing Penalty (veh)				65	15		0	2	0	0

Intersection: 4: Red Oak Drive & Benns Church Boulevard

Movement	EB	NB	SB
Directions Served	LR	L	R
Maximum Queue (ft)	59	51	2
Average Queue (ft)	16	15	0
95th Queue (ft)	43	42	0
Link Distance (ft)	949		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		200	140
Storage Blk Time (%)			
Queuing Penalty (veh)			

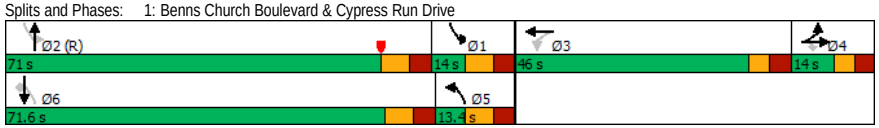
Network Summary

Network wide Queuing Penalty: 87

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	38	2	0	0	45	833	2	3	1050	30
Future Volume (vph)	15	0	38	2	0	0	45	833	2	3	1050	30
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950			0.950		0.950			0.950		
Satd. Flow (prot)	0	1492	1495	0	1203	0	1641	3374	0	1805	3471	1509
Flt Permitted		0.950					0.220			0.308		
Satd. Flow (perm)	0	1492	1495	0	1267	0	380	3374	0	585	3471	1509
Satd. Flow (RTOR)			157									145
Adj. Flow (vph)	16	0	40	2	0	0	47	868	2	3	1094	31
Lane Group Flow (vph)	0	16	40	0	2	0	47	870	0	3	1094	31
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Total Split (s)	14.0	14.0	14.0	46.0	46.0		13.4	71.0		14.0	71.6	71.6
Total Lost Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		7.7	7.7		10.3		113.2	118.8		118.4	110.9	110.9
Actuated g/C Ratio		0.05	0.05		0.07		0.78	0.82		0.82	0.76	0.76
v/c Ratio		0.20	0.18		0.02		0.14	0.31		0.01	0.41	0.03
Control Delay		71.5	1.7		59.0		6.3	8.7		5.7	9.6	0.0
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		71.5	1.7		59.0		6.3	8.7		5.7	9.6	0.0
LOS		E	A		E		A	A		A	A	A
Approach Delay		21.6			59.0			8.6			9.3	
Approach LOS		C			E			A			A	

Intersection Summary			
Cycle Length: 145			
Actuated Cycle Length: 145			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 59.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	38	2	0	0	45	833	2	3	1050	30
Future Volume (vph)	15	0	38	2	0	0	45	833	2	3	1050	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.95		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1492	1495		1203		1641	3373		1805	3471	1509
Flt Permitted		0.95	1.00		1.00		0.22	1.00		0.31	1.00	1.00
Satd. Flow (perm)		1492	1495		1267		381	3373		585	3471	1509
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	16	0	40	2	0	0	47	868	2	3	1094	31
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	0	0	0	11
Lane Group Flow (vph)	0	16	2	0	2	0	47	870	0	3	1094	20
Heavy Vehicles (%)	21%	0%	8%	50%	0%	0%	10%	7%	0%	0%	4%	7%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Actuated Green, G (s)		6.3	6.3		3.5		104.5	103.4		104.5	95.5	95.5
Effective Green, g (s)		6.3	6.3		3.5		104.5	103.4		104.5	95.5	95.5
Actuated g/C Ratio		0.04	0.04		0.02		0.72	0.71		0.72	0.66	0.66
Clearance Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0		3.0		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		64	64		30		352	2405		430	2286	993
v/s Ratio Prot		c0.01					c0.01	0.26		0.00	c0.32	
v/s Ratio Perm			0.00		c0.00		0.09			0.00		0.01
v/c Ratio		0.25	0.03		0.07		0.13	0.36		0.01	0.48	0.02
Uniform Delay, d1		67.1	66.4		69.2		11.8	8.0		7.4	12.3	8.6
Progression Factor		1.00	1.00		1.00		0.96	1.34		1.00	1.00	1.00
Incremental Delay, d2		2.1	0.2		0.9		0.1	0.4		0.0	0.7	0.0
Delay (s)		69.1	66.6		70.1		11.4	11.2		7.4	13.1	8.6
Level of Service		E	E		E		B	B		A	B	A
Approach Delay (s)		67.3			70.1			11.2			12.9	
Approach LOS		E			E			B			B	

Intersection Summary				
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	30.7	
Intersection Capacity Utilization	59.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	15	0	881	1057	33
Future Volume (vph)	0	15	0	881	1057	33
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3374	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3374	3471	1583
Adj. Flow (vph)	0	16	0	958	1149	36
Lane Group Flow (vph)	0	16	0	958	1149	36
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	15	0	881	1057	33
Future Volume (Veh/h)	0	15	0	881	1057	33
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	958	1149	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.84	0.84	0.84			
vC, conflicting volume	1628	574	1185			
vC1, stage 1 conf vol	1149					
vC2, stage 2 conf vol	479					
vCu, unblocked vol	1373	123	847			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	243	763	663			

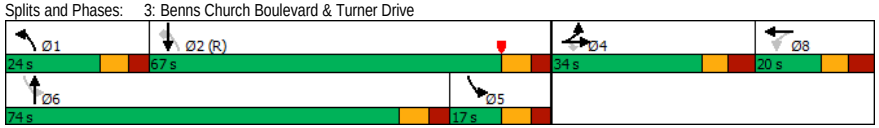
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	16	479	479	574	574	36
Volume Left	0	0	0	0	0	0
Volume Right	16	0	0	0	0	36
cSH	763	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.28	0.28	0.34	0.34	0.02
Queue Length 95th (ft)	2	0	0	0	0	0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.8	0.0		0.0		
Approach LOS	A					

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	39.2%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	316	0	135	2	0	2	342	580	0	4	791	273
Future Volume (vph)	316	0	135	2	0	2	342	580	0	4	791	273
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.932							0.850
Flt Protected	0.950	0.950			0.976		0.950			0.950		
Satd. Flow (prot)	1531	1531	1524	0	1728	0	1719	3438	0	1805	3505	1538
Flt Permitted	0.950	0.950					0.168			0.372		
Satd. Flow (perm)	1531	1531	1524	0	1771	0	304	3438	0	707	3505	1538
Satd. Flow (RTOR)			232		232							310
Adj. Flow (vph)	359	0	153	2	0	2	389	659	0	5	899	310
Lane Group Flow (vph)	179	180	153	0	4	0	389	659	0	5	899	310
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2			6		2
Total Split (s)	34.0	34.0	34.0	20.0	20.0		24.0	74.0		17.0	67.0	67.0
Total Lost Time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Act Effct Green (s)	22.6	22.6	22.6		7.0		93.6	98.5		100.3	59.8	59.8
Actuated g/C Ratio	0.16	0.16	0.16		0.05		0.65	0.68		0.69	0.41	0.41
v/c Ratio	0.75	0.76	0.35		0.01		0.74	0.28		0.01	0.62	0.38
Control Delay	78.0	78.4	2.3		0.0		33.7	11.8		4.5	37.0	11.5
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	78.0	78.4	2.3		0.0		33.7	11.8		4.5	37.0	11.5
LOS	E	E	A		A		C	B		A	D	B
Approach Delay		55.5						19.9			30.4	
Approach LOS		E						B			C	

Intersection Summary			
Cycle Length: 145			
Actuated Cycle Length: 145			
Offset: 49 (34%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 31.0		Intersection LOS: C	
Intersection Capacity Utilization 77.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	316	0	135	2	0	2	342	580	0	4	791	273
Future Volume (vph)	316	0	135	2	0	2	342	580	0	4	791	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1531	1531	1524		1729		1719	3438		1805	3505	1538
Flt Permitted	0.95	0.95	1.00		1.00		0.17	1.00		0.37	1.00	1.00
Satd. Flow (perm)	1531	1531	1524		1772		305	3438		708	3505	1538
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	359	0	153	2	0	2	389	659	0	5	899	310
RTOR Reduction (vph)	0	0	129	0	4	0	0	0	0	0	0	198
Lane Group Flow (vph)	179	180	24	0	0	0	389	659	0	5	899	112
Heavy Vehicles (%)	12%	0%	6%	0%	0%	0%	5%	5%	0%	0%	3%	5%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2			6		2
Actuated Green, G (s)	22.6	22.6	22.6		1.4		86.4	84.7		86.4	52.6	52.6
Effective Green, g (s)	22.6	22.6	22.6		1.4		86.4	84.7		86.4	52.6	52.6
Actuated g/C Ratio	0.16	0.16	0.16		0.01		0.60	0.58		0.60	0.36	0.36
Clearance Time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Vehicle Extension (s)	5.0	5.0	5.0		3.0		4.0	6.0		2.0	6.0	6.0
Lane Grp Cap (vph)	238	238	237		17		511	2008		434	1271	557
v/s Ratio Prot	0.12	c0.12					c0.18	0.19		0.00	0.26	
v/s Ratio Perm			0.02		c0.00		c0.28			0.01		0.07
v/c Ratio	0.75	0.76	0.10		0.00		0.76	0.33		0.01	0.71	0.20
Uniform Delay, d1	58.5	58.6	52.5		71.1		27.0	15.5		14.5	39.6	31.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		0.48	1.03	3.63
Incremental Delay, d2	14.8	15.1	0.4		0.1		7.0	0.4		0.0	3.2	0.8
Delay (s)	73.3	73.6	52.9		71.2		34.0	15.9		6.9	44.1	116.1
Level of Service	E	E	D		E		C	B		A	D	F
Approach Delay (s)		67.3			71.2			22.6			62.3	
Approach LOS		E			E			C			E	

Intersection Summary					
HCM 2000 Control Delay		48.3	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio		0.75			
Actuated Cycle Length (s)		145.0	Sum of lost time (s)		34.6
Intersection Capacity Utilization		77.6%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	20	12	934	1090	19
Future Volume (vph)	11	20	12	934	1090	19
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.913					0.850
Flt Protected	0.983		0.950			
Satd. Flow (prot)	1694	0	1787	3406	3471	1599
Flt Permitted	0.983		0.950			
Satd. Flow (perm)	1694	0	1787	3406	3471	1599
Adj. Flow (vph)	12	22	13	1026	1198	21
Lane Group Flow (vph)	34	0	13	1026	1198	21
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 40.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	20	12	934	1090	19
Future Volume (Veh/h)	11	20	12	934	1090	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	12	22	13	1026	1198	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1737	599	1219			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1737	599	1219			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	95	98			
cM capacity (veh/h)	78	447	573			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	13	513	513	599	599	21
Volume Left	12	13	0	0	0	0	0
Volume Right	22	0	0	0	0	0	21
cSH	168	573	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.02	0.30	0.30	0.35	0.35	0.01
Queue Length 95th (ft)	18	2	0	0	0	0	0
Control Delay (s)	31.8	11.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B					
Approach Delay (s)	31.8	0.1			0.0		
Approach LOS	D						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	40.1%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	79	0	880	988	84
Future Volume (vph)	0	79	0	880	988	84
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3374	3438	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3374	3438	1583
Adj. Flow (vph)	0	83	0	926	1040	88
Lane Group Flow (vph)	0	83	0	926	1040	88
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	79	0	880	988	84
Future Volume (Veh/h)	0	79	0	880	988	84
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	83	0	926	1040	88
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				844		
pX, platoon unblocked	0.91					
vC, conflicting volume	1503	520	1128			
vC1, stage 1 conf vol	1040					
vC2, stage 2 conf vol	463					
vCu, unblocked vol	1361	520	1128			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	83	100			
cM capacity (veh/h)	284	501	615			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	83	463	463	520	520	88
Volume Left	0	0	0	0	0	0
Volume Right	83	0	0	0	0	88
cSH	501	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.27	0.27	0.31	0.31	0.05
Queue Length 95th (ft)	15	0	0	0	0	0
Control Delay (s)	13.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	13.6	0.0		0.0		
Approach LOS	B					

Intersection Summary					
Average Delay		0.5			
Intersection Capacity Utilization		38.9%	ICU Level of Service		A
Analysis Period (min)		15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	62	0	922	889	55
Future Volume (vph)	0	62	0	922	889	55
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3406	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3406	3471	1583
Adj. Flow (vph)	0	65	0	971	936	58
Lane Group Flow (vph)	0	65	0	971	936	58
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	62	0	922	889	55
Future Volume (Veh/h)	0	62	0	922	889	55
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	65	0	971	936	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)					340	
pX, platoon unblocked	0.78	0.78	0.78			
vC, conflicting volume	1422	468	994			
vC1, stage 1 conf vol	936					
vC2, stage 2 conf vol	486					
vCu, unblocked vol	989	0	444			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	100			
cM capacity (veh/h)	421	851	873			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	65	486	486	468	468	58
Volume Left	0	0	0	0	0	0
Volume Right	65	0	0	0	0	58
cSH	851	1700	1700	1700	1700	1700
Volume to Capacity	0.08	0.29	0.29	0.28	0.28	0.03
Queue Length 95th (ft)	6	0	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.6	0.0		0.0		
Approach LOS	A					

Intersection Summary					
Average Delay	0.3				
Intersection Capacity Utilization	35.1%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	180	0	0	0	23	922	0	0	927	8
Future Volume (vph)	0	0	180	0	0	0	23	922	0	0	927	8
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.865								0.999	
Flt Protected							0.950					
Satd. Flow (prot)	0	0	1611	0	0	1863	1770	3406	0	0	3468	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	1611	0	0	1863	1770	3406	0	0	3468	0
Adj. Flow (vph)	0	0	189	0	0	0	24	971	0	0	976	8
Lane Group Flow (vph)	0	0	189	0	0	0	24	971	0	0	984	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 43.7%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	180	0	0	0	23	922	0	0	927	8
Future Volume (Veh/h)	0	0	180	0	0	0	23	922	0	0	927	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	189	0	0	0	24	971	0	0	976	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1514	1999	492	1696	2003	486	984			971		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1514	1999	492	1696	2003	486	984			971		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	64	100	100	100	97			100		
cM capacity (veh/h)	80	57	522	37	57	528	698			706		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	189	0	24	647	324	651	333
Volume Left	0	0	24	0	0	0	0
Volume Right	189	0	0	0	0	0	8
cSH	522	1700	698	1700	1700	1700	1700
Volume to Capacity	0.36	0.00	0.03	0.38	0.19	0.38	0.20
Queue Length 95th (ft)	41	0	3	0	0	0	0
Control Delay (s)	15.7	0.0	10.3	0.0	0.0	0.0	0.0
Lane LOS	C	A	B				
Approach Delay (s)	15.7	0.0	0.2			0.0	
Approach LOS	C	A					

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	43.7%	ICU Level of Service	A	
Analysis Period (min)	15			

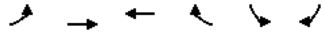
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	9	0	0	4
Future Volume (vph)	0	0	9	0	0	4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected				0.950		
Satd. Flow (prot)	1863	0	0	1770	1611	0
Flt Permitted				0.950		
Satd. Flow (perm)	1863	0	0	1770	1611	0
Adj. Flow (vph)	0	0	10	0	0	4
Lane Group Flow (vph)	0	0	0	10	4	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	9	0	0	4
Future Volume (Veh/h)	0	0	9	0	0	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	10	0	0	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		20	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		20	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1623		991	1085

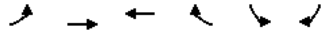
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	0	10	4
Volume Left	0	10	0
Volume Right	0	0	4
cSH	1700	1623	1085
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	7.2	8.3
Lane LOS		A	A
Approach Delay (s)	0.0	7.2	8.3
Approach LOS			A

Intersection Summary				
Average Delay		7.5		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	2	5	0
Future Volume (vph)	0	0	0	2	5	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	0
Adj. Flow (vph)	0	0	0	2	5	0
Lane Group Flow (vph)	0	0	2	0	5	0
Sign Control		Free	Free		Stop	

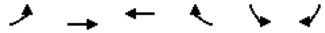
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	2	5	0
Future Volume (Veh/h)	0	0	0	2	5	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	5	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2				1	1
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2				1	1
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1620				1022	1084

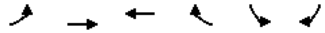
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	2	5
Volume Left	0	0	5
Volume Right	0	2	0
cSH	1700	1700	1022
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.5
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.5
Approach LOS			A

Intersection Summary				
Average Delay		6.1		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	158	0	0	0	0
Future Volume (vph)	0	158	0	0	0	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Adj. Flow (vph)	0	172	0	0	0	0
Lane Group Flow (vph)	0	172	0	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 11.6%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	158	0	0	0	0
Future Volume (Veh/h)	0	158	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	172	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				172	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				172	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				818	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	172	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1623	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		11.6%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	895	0	0	1062
Future Volume (vph)	0	0	895	0	0	1062
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	0	0	3539
Adj. Flow (vph)	0	0	973	0	0	1154
Lane Group Flow (vph)	0	0	973	0	0	1154
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	895	0	0	1062
Future Volume (Veh/h)	0	0	895	0	0	1062
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	973	0	0	1154
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1550	486			973	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1550	486			973	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	104	527			704	

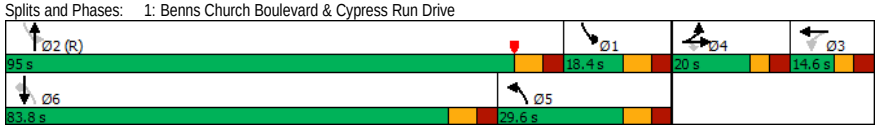
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	649	324	577	577
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.38	0.19	0.34	0.34
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		32.7%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	0	96	0	4	0	194	1230	0	3	1239	116
Future Volume (vph)	100	0	96	0	4	0	194	1230	0	3	1239	116
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1805	1615	0	1900	0	1805	3539	0	1805	3471	1553
Flt Permitted		0.950					0.145			0.181		
Satd. Flow (perm)	0	1805	1615	0	1900	0	276	3539	0	344	3471	1553
Satd. Flow (RTOR)			216									204
Adj. Flow (vph)	102	0	98	0	4	0	198	1255	0	3	1264	118
Lane Group Flow (vph)	0	102	98	0	4	0	198	1255	0	3	1264	118
Turn Type	Split	NA	Perm		NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Total Split (s)	20.0	20.0	20.0	14.6	14.6		29.6	95.0		18.4	83.8	83.8
Total Lost Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		13.2	13.2		7.0		108.4	113.7		118.5	97.1	97.1
Actuated g/C Ratio		0.09	0.09		0.05		0.73	0.77		0.80	0.66	0.66
v/c Ratio		0.64	0.29		0.04		0.62	0.46		0.01	0.56	0.11
Control Delay		82.3	2.1		68.5		23.6	11.4		5.7	17.0	0.2
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		82.3	2.1		68.5		23.6	11.4		5.7	17.0	0.2
LOS		F	A		E		C	B		A	B	A
Approach Delay		43.0			68.5			13.1			15.5	
Approach LOS		D			E			B			B	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 76.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	0	96	0	4	0	194	1230	0	3	1239	116
Future Volume (vph)	100	0	96	0	4	0	194	1230	0	3	1239	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1805	1615		1900		1805	3539		1805	3471	1553
Flt Permitted		0.95	1.00		1.00		0.15	1.00		0.18	1.00	1.00
Satd. Flow (perm)		1805	1615		1900		276	3539		344	3471	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	0	98	0	4	0	198	1255	0	3	1264	118
RTOR Reduction (vph)	0	0	89	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	102	9	0	4	0	198	1255	0	3	1264	68
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	4%
Turn Type	Split	NA	Perm		NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Actuated Green, G (s)		13.2	13.2		1.4		102.7	101.3		102.7	84.7	84.7
Effective Green, g (s)		13.2	13.2		1.4		102.7	101.3		102.7	84.7	84.7
Actuated g/C Ratio		0.09	0.09		0.01		0.69	0.68		0.69	0.57	0.57
Clearance Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0		3.0		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		160	144		17		377	2422		252	1986	888
v/s Ratio Prot		c0.06			c0.00		c0.06	0.35		0.00	c0.36	
v/s Ratio Perm			0.01				0.30			0.01		0.04
v/c Ratio		0.64	0.06		0.24		0.53	0.52		0.01	0.64	0.08
Uniform Delay, d1		65.1	61.7		72.8		32.8	11.4		13.9	21.3	14.2
Progression Factor		1.00	1.00		1.00		0.86	1.33		1.00	1.00	1.00
Incremental Delay, d2		8.1	0.2		7.0		0.5	0.7		0.0	1.6	0.2
Delay (s)		73.2	61.9		79.8		28.8	15.9		13.9	22.9	14.3
Level of Service		E	E		E		C	B		B	C	B
Approach Delay (s)		67.6			79.8			17.7			22.1	
Approach LOS		E			E			B			C	

Intersection Summary					
HCM 2000 Control Delay		23.1	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.61			
Actuated Cycle Length (s)		148.0	Sum of lost time (s)		30.7
Intersection Capacity Utilization		76.9%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	19	0	1423	1310	24
Future Volume (vph)	0	19	0	1423	1310	24
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3471	1583
Adj. Flow (vph)	0	21	0	1547	1424	26
Lane Group Flow (vph)	0	21	0	1547	1424	26
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	19	0	1423	1310	24
Future Volume (Veh/h)	0	19	0	1423	1310	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	21	0	1547	1424	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	2198	712	1450			
vC1, stage 1 conf vol	1424					
vC2, stage 2 conf vol	774					
vCu, unblocked vol	1931	0	935			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	168	814	546			

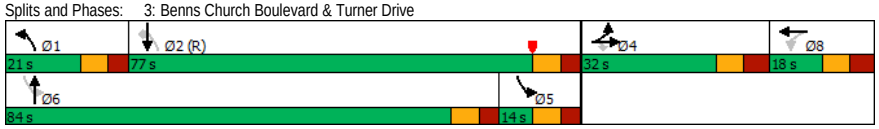
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	21	774	774	712	712	26
Volume Left	0	0	0	0	0	0
Volume Right	21	0	0	0	0	26
cSH	814	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.46	0.46	0.42	0.42	0.02
Queue Length 95th (ft)	2	0	0	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.5	0.0		0.0		
Approach LOS	A					

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		46.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	2	112	3	0	8	289	1179	4	29	1103	192
Future Volume (vph)	250	2	112	3	0	8	289	1179	4	29	1103	192
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.902							0.850
Flt Protected	0.950	0.953			0.987		0.950			0.950		
Satd. Flow (prot)	1698	1703	1599	0	1692	0	1719	3539	0	1805	3539	1615
Flt Permitted	0.950	0.953			0.909		0.118			0.159		
Satd. Flow (perm)	1698	1703	1599	0	1558	0	214	3539	0	302	3539	1615
Satd. Flow (RTOR)			228		228							183
Adj. Flow (vph)	263	2	118	3	0	8	304	1241	4	31	1161	202
Lane Group Flow (vph)	131	134	118	0	11	0	304	1245	0	31	1161	202
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2			6		2
Total Split (s)	32.0	32.0	32.0	18.0	18.0		21.0	84.0		14.0	77.0	77.0
Total Lost Time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Act Effct Green (s)	18.7	18.7	18.7		7.0		97.3	97.2		100.6	71.2	71.2
Actuated g/C Ratio	0.13	0.13	0.13		0.05		0.66	0.66		0.68	0.48	0.48
v/c Ratio	0.61	0.62	0.29		0.04		0.75	0.54		0.12	0.68	0.23
Control Delay	72.9	73.6	1.9		0.2		40.5	17.7		3.7	29.8	7.4
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.9	73.6	1.9		0.2		40.5	17.7		3.7	29.8	7.4
LOS	E	E	A		A		D	B		A	C	A
Approach Delay		51.3			0.2			22.2			25.9	
Approach LOS		D			A			C			C	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 38 (26%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 27.0		Intersection LOS: C	
Intersection Capacity Utilization 81.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	2	112	3	0	8	289	1179	4	29	1103	192
Future Volume (vph)	250	2	112	3	0	8	289	1179	4	29	1103	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1703	1599		1690		1719	3538		1805	3539	1615
Flt Permitted	0.95	0.95	1.00		0.91		0.12	1.00		0.16	1.00	1.00
Satd. Flow (perm)	1698	1703	1599		1558		214	3538		302	3539	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	263	2	118	3	0	8	304	1241	4	31	1161	202
RTOR Reduction (vph)	0	0	103	0	11	0	0	0	0	0	0	102
Lane Group Flow (vph)	131	134	15	0	0	0	304	1245	0	31	1161	100
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	5%	2%	0%	0%	2%	0%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2			6		2
Actuated Green, G (s)	18.7	18.7	18.7		2.8		91.9	88.5		91.9	65.8	65.8
Effective Green, g (s)	18.7	18.7	18.7		2.8		91.9	88.5		91.9	65.8	65.8
Actuated g/C Ratio	0.13	0.13	0.13		0.02		0.62	0.60		0.62	0.44	0.44
Clearance Time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Vehicle Extension (s)	5.0	5.0	5.0		3.0		4.0	6.0		2.0	6.0	6.0
Lane Grp Cap (vph)	214	215	202		29		398	2115		222	1573	718
v/s Ratio Prot	0.08	c0.08					c0.13	0.35		0.00	0.33	
v/s Ratio Perm			0.01		c0.00		c0.34			0.08		0.06
v/c Ratio	0.61	0.62	0.07		0.01		0.76	0.59		0.14	0.74	0.14
Uniform Delay, d1	61.2	61.3	57.0		71.2		31.8	18.5		24.4	34.0	24.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		0.26	0.92	1.68
Incremental Delay, d2	7.3	7.7	0.3		0.1		9.0	1.2		0.1	2.8	0.4
Delay (s)	68.5	69.0	57.3		71.3		40.8	19.7		6.5	34.0	41.2
Level of Service	E	E	E		E		D	B		A	C	D
Approach Delay (s)		65.3			71.3			23.8			34.4	
Approach LOS		E			E			C			C	

Intersection Summary				
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	34.6	
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	15	29	1486	1263	22
Future Volume (vph)	9	15	29	1486	1263	22
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.914					0.850
Flt Protected	0.982		0.950			
Satd. Flow (prot)	1705	0	1736	3539	3505	1615
Flt Permitted	0.982		0.950			
Satd. Flow (perm)	1705	0	1736	3539	3505	1615
Adj. Flow (vph)	9	16	30	1548	1316	23
Lane Group Flow (vph)	25	0	30	1548	1316	23
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	15	29	1486	1263	22
Future Volume (Veh/h)	9	15	29	1486	1263	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	16	30	1548	1316	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2150	658	1339			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2150	658	1339			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	96	94			
cM capacity (veh/h)	40	412	500			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	30	774	774	658	658	23
Volume Left	9	30	0	0	0	0	0
Volume Right	16	0	0	0	0	0	23
cSH	94	500	1700	1700	1700	1700	1700
Volume to Capacity	0.27	0.06	0.46	0.46	0.39	0.39	0.01
Queue Length 95th (ft)	24	5	0	0	0	0	0
Control Delay (s)	56.5	12.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B					
Approach Delay (s)	56.5	0.2			0.0		
Approach LOS	F						

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	51.1%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	60	0	1421	1264	66
Future Volume (vph)	0	60	0	1421	1264	66
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3539	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3539	1583
Adj. Flow (vph)	0	63	0	1496	1331	69
Lane Group Flow (vph)	0	63	0	1496	1331	69
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	60	0	1421	1264	66
Future Volume (Veh/h)	0	60	0	1421	1264	66
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	63	0	1496	1331	69
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				844		
pX, platoon unblocked	0.78					
vC, conflicting volume	2079	666	1400			
vC1, stage 1 conf vol	1331					
vC2, stage 2 conf vol	748					
vCu, unblocked vol	1813	666	1400			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	84	100			
cM capacity (veh/h)	199	402	484			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	63	748	748	666	666	69
Volume Left	0	0	0	0	0	0
Volume Right	63	0	0	0	0	69
cSH	402	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.44	0.44	0.39	0.39	0.04
Queue Length 95th (ft)	14	0	0	0	0	0
Control Delay (s)	15.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	15.6	0.0		0.0		
Approach LOS	C					

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	45.3%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	47	0	1472	1188	40
Future Volume (vph)	0	47	0	1472	1188	40
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3539	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3539	1583
Adj. Flow (vph)	0	49	0	1549	1251	42
Lane Group Flow (vph)	0	49	0	1549	1251	42
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	47	0	1472	1188	40
Future Volume (Veh/h)	0	47	0	1472	1188	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	49	0	1549	1251	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)					340	
pX, platoon unblocked	0.73	0.73	0.73			
vC, conflicting volume	2026	626	1293			
vC1, stage 1 conf vol	1251					
vC2, stage 2 conf vol	774					
vCu, unblocked vol	1661	0	654			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	276	789	676			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	49	774	774	626	626	42
Volume Left	0	0	0	0	0	0
Volume Right	49	0	0	0	0	42
cSH	789	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.46	0.46	0.37	0.37	0.02
Queue Length 95th (ft)	5	0	0	0	0	0
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.9	0.0		0.0		
Approach LOS	A					

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	44.0%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	0	0	0	22	1472	0	0	1216	7
Future Volume (vph)	0	0	69	0	0	0	22	1472	0	0	1216	7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.865								0.999	
Flt Protected							0.950					
Satd. Flow (prot)	0	0	1611	0	0	1863	1770	3539	0	0	3536	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	1611	0	0	1863	1770	3539	0	0	3536	0
Adj. Flow (vph)	0	0	73	0	0	0	23	1549	0	0	1280	7
Lane Group Flow (vph)	0	0	73	0	0	0	23	1549	0	0	1287	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 44.8%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	69	0	0	0	22	1472	0	0	1216	7
Future Volume (Veh/h)	0	0	69	0	0	0	22	1472	0	0	1216	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	73	0	0	0	23	1549	0	0	1280	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2104	2878	644	2308	2882	774	1287			1549		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2104	2878	644	2308	2882	774	1287			1549		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	82	100	100	100	96			100		
cM capacity (veh/h)	28	15	416	16	15	341	535			424		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	73	0	23	1033	516	853	434
Volume Left	0	0	23	0	0	0	0
Volume Right	73	0	0	0	0	0	7
cSH	416	1700	535	1700	1700	1700	1700
Volume to Capacity	0.18	0.00	0.04	0.61	0.30	0.50	0.26
Queue Length 95th (ft)	16	0	3	0	0	0	0
Control Delay (s)	15.5	0.0	12.0	0.0	0.0	0.0	0.0
Lane LOS	C	A	B				
Approach Delay (s)	15.5	0.0	0.2			0.0	
Approach LOS	C	A					

Intersection Summary					
Average Delay		0.5			
Intersection Capacity Utilization	44.8%	ICU Level of Service		A	
Analysis Period (min)	15				

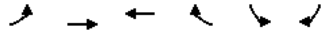
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	12	0	0	6
Future Volume (vph)	0	0	12	0	0	6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected				0.950		
Satd. Flow (prot)	1863	0	0	1770	1611	0
Flt Permitted				0.950		
Satd. Flow (perm)	1863	0	0	1770	1611	0
Adj. Flow (vph)	0	0	13	0	0	7
Lane Group Flow (vph)	0	0	0	13	7	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	12	0	0	6
Future Volume (Veh/h)	0	0	12	0	0	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	13	0	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		26	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		26	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1623		981	1085

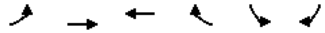
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	0	13	7
Volume Left	0	13	0
Volume Right	0	0	7
cSH	1700	1623	1085
Volume to Capacity	0.00	0.01	0.01
Queue Length 95th (ft)	0	1	0
Control Delay (s)	0.0	7.2	8.3
Lane LOS		A	A
Approach Delay (s)	0.0	7.2	8.3
Approach LOS			A

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Adj. Flow (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	

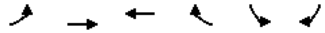
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 0.0%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

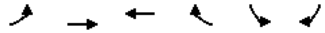
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		0.0%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	46	0
Future Volume (vph)	0	0	0	0	46	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	0
Adj. Flow (vph)	0	0	0	0	50	0
Lane Group Flow (vph)	0	0	0	0	50	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	46	0
Future Volume (Veh/h)	0	0	0	0	46	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	50	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	50
Volume Left	0	0	50
Volume Right	0	0	0
cSH	1700	1700	1023
Volume to Capacity	0.00	0.00	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary				
Average Delay		8.7		
Intersection Capacity Utilization		6.7%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	1441	0	0	1230
Future Volume (vph)	0	0	1441	0	0	1230
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	0	0	3539
Adj. Flow (vph)	0	0	1566	0	0	1337
Lane Group Flow (vph)	0	0	1566	0	0	1337
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 43.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1441	0	0	1230
Future Volume (Veh/h)	0	0	1441	0	0	1230
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	1566	0	0	1337
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2234	783			1566	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2234	783			1566	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	36	337			418	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	1044	522	668	668
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.61	0.31	0.39	0.39
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		43.2%	ICU Level of Service	A
Analysis Period (min)		15		

MOVEMENT SUMMARY

Site: 101 [Turner Drive at Site Driveway #9 2045 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Site Driveway #5														
3	L2	15	2.0	16	2.0	0.179	5.6	LOS A	0.8	20.2	0.49	0.40	0.49	34.6
8	T1	7	2.0	8	2.0	0.179	5.6	LOS A	0.8	20.2	0.49	0.40	0.49	34.5
18	R2	132	2.0	143	2.0	0.179	5.6	LOS A	0.8	20.2	0.49	0.40	0.49	33.5
Approach		154	2.0	167	2.0	0.179	5.6	LOS A	0.8	20.2	0.49	0.40	0.49	33.7
East: Turner Drive														
1	L2	102	2.0	111	2.0	0.512	8.2	LOS A	4.1	103.3	0.23	0.09	0.23	24.0
6	T1	489	2.0	532	2.0	0.512	8.2	LOS A	4.1	103.3	0.23	0.09	0.23	23.6
16	R2	24	2.0	26	2.0	0.512	8.2	LOS A	4.1	103.3	0.23	0.09	0.23	23.0
Approach		615	2.0	668	2.0	0.512	8.2	LOS A	4.1	103.3	0.23	0.09	0.23	23.6
North: Site Driveway #5														
7	L2	45	2.0	49	2.0	0.091	6.3	LOS A	0.4	9.0	0.59	0.55	0.59	32.5
4	T1	4	2.0	4	2.0	0.091	6.3	LOS A	0.4	9.0	0.59	0.55	0.59	32.4
14	R2	8	2.0	9	2.0	0.091	6.3	LOS A	0.4	9.0	0.59	0.55	0.59	31.5
Approach		57	2.0	62	2.0	0.091	6.3	LOS A	0.4	9.0	0.59	0.55	0.59	32.3
West: Turner Drive														
5	L2	10	2.0	11	2.0	0.314	6.2	LOS A	1.7	43.3	0.39	0.25	0.39	24.7
2	T1	273	2.0	297	2.0	0.314	6.2	LOS A	1.7	43.3	0.39	0.25	0.39	24.2
12	R2	47	2.0	51	2.0	0.314	6.2	LOS A	1.7	43.3	0.39	0.25	0.39	23.6
Approach		330	2.0	359	2.0	0.314	6.2	LOS A	1.7	43.3	0.39	0.25	0.39	24.2
All Vehicles		1156	2.0	1257	2.0	0.512	7.2	LOS A	4.1	103.3	0.33	0.20	0.33	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.

MOVEMENT SUMMARY

Site: 101 [Turner Drive at Site Driveway #9 2045 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Site Driveway #5														
3	L2	15	2.0	16	2.0	0.137	4.9	LOS A	0.6	15.2	0.44	0.33	0.44	34.9
8	T1	8	2.0	9	2.0	0.137	4.9	LOS A	0.6	15.2	0.44	0.33	0.44	34.9
18	R2	102	2.0	111	2.0	0.137	4.9	LOS A	0.6	15.2	0.44	0.33	0.44	33.8
Approach		125	2.0	136	2.0	0.137	4.9	LOS A	0.6	15.2	0.44	0.33	0.44	34.0
East: Turner Drive														
1	L2	77	2.0	84	2.0	0.403	6.7	LOS A	2.6	67.3	0.22	0.08	0.22	24.4
6	T1	364	2.0	396	2.0	0.403	6.7	LOS A	2.6	67.3	0.22	0.08	0.22	23.9
16	R2	39	2.0	42	2.0	0.403	6.7	LOS A	2.6	67.3	0.22	0.08	0.22	23.4
Approach		480	2.0	522	2.0	0.403	6.7	LOS A	2.6	67.3	0.22	0.08	0.22	24.0
North: Site Driveway #5														
7	L2	69	2.0	75	2.0	0.117	5.6	LOS A	0.5	12.1	0.54	0.47	0.54	32.8
4	T1	6	2.0	7	2.0	0.117	5.6	LOS A	0.5	12.1	0.54	0.47	0.54	32.7
14	R2	12	2.0	13	2.0	0.117	5.6	LOS A	0.5	12.1	0.54	0.47	0.54	31.8
Approach		87	2.0	95	2.0	0.117	5.6	LOS A	0.5	12.1	0.54	0.47	0.54	32.6
West: Turner Drive														
5	L2	16	2.0	17	2.0	0.278	5.8	LOS A	1.4	36.7	0.38	0.24	0.38	24.8
2	T1	192	2.0	209	2.0	0.278	5.8	LOS A	1.4	36.7	0.38	0.24	0.38	24.3
12	R2	83	2.0	90	2.0	0.278	5.8	LOS A	1.4	36.7	0.38	0.24	0.38	23.7
Approach		291	2.0	316	2.0	0.278	5.8	LOS A	1.4	36.7	0.38	0.24	0.38	24.1
All Vehicles		983	2.0	1068	2.0	0.403	6.1	LOS A	2.6	67.3	0.32	0.20	0.32	25.6

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.

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	65	63	33	70	112	118	20	153	166	37
Average Queue (ft)	14	17	2	25	18	28	1	51	62	4
95th Queue (ft)	44	43	16	57	65	82	9	117	139	21
Link Distance (ft)	656		676		798	798		1702	1702	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		180		255			150			245
Storage Blk Time (%)								0		
Queuing Penalty (veh)								0		

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB	SB
Directions Served	R	R
Maximum Queue (ft)	34	5
Average Queue (ft)	9	0
95th Queue (ft)	30	5
Link Distance (ft)	470	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		75
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	311	280	148	32	130	277	249	70	394	431	279
Average Queue (ft)	169	145	55	5	118	162	85	4	198	208	108
95th Queue (ft)	262	236	113	22	151	320	189	34	326	345	244
Link Distance (ft)	384			471		260	260		780	780	
Upstream Blk Time (%)	0					6	0				
Queuing Penalty (veh)	0					29	0				
Storage Bay Dist (ft)		305	305		130			140			280
Storage Blk Time (%)	0	0	0		23	11		0	18	2	0
Queuing Penalty (veh)	1	0	0		68	39		0	1	6	1

Intersection: 4: Benns Church Boulevard & Red Oak Drive

Movement	EB	NB	SB
Directions Served	LR	L	R
Maximum Queue (ft)	49	32	2
Average Queue (ft)	17	6	0
95th Queue (ft)	41	24	2
Link Distance (ft)	950		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		200	140
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Benns Church Boulevard & Site Driveway #1

Movement	EB
Directions Served	R
Maximum Queue (ft)	61
Average Queue (ft)	25
95th Queue (ft)	48
Link Distance (ft)	377
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Benns Church Boulevard & Site Driveway #2

Movement	EB	NB	NB
Directions Served	R	T	T
Maximum Queue (ft)	69	176	69
Average Queue (ft)	27	23	3
95th Queue (ft)	53	110	38
Link Distance (ft)	325	1039	1039
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	EB	NB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	155	37	9
Average Queue (ft)	60	9	0
95th Queue (ft)	119	31	7
Link Distance (ft)	751		1039
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		200	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: Site Driveway #4 & Tractor Supply Entrance

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: Site Driveway #5 & Turner Drive

Movement	EB
Directions Served	LT
Maximum Queue (ft)	5
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	1402
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Tractor Supply Entrance & Site Driveway #6

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	4
95th Queue (ft)	22
Link Distance (ft)	938
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: Site Driveway #3 & Site Driveway #5

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 12: Benns Church Boulevard & Site Driveway #7

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 145

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	201	155	34	228	267	268	32	358	354	209
Average Queue (ft)	84	38	4	109	87	99	2	177	172	43
95th Queue (ft)	160	94	19	201	208	211	19	304	308	154
Link Distance (ft)	656		676		798	798		1702	1702	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		180		255			150			245
Storage Blk Time (%)	1	0		0	0			10	2	0
Queuing Penalty (veh)	1	0		2	0			0	3	1

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	10
95th Queue (ft)	30
Link Distance (ft)	470
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	228	206	136	46	130	290	291	132	370	385	279
Average Queue (ft)	123	99	50	11	122	207	170	30	195	208	85
95th Queue (ft)	197	173	102	35	148	330	295	86	350	367	250
Link Distance (ft)	384			471		260	260		780	780	
Upstream Blk Time (%)						10	2				
Queuing Penalty (veh)						74	13				
Storage Bay Dist (ft)		305	305		130			140			280
Storage Blk Time (%)	0	0			28	15		0	11	2	0
Queuing Penalty (veh)	0	0			167	42		0	3	5	1

Intersection: 4: Benns Church Boulevard & Red Oak Drive

Movement	EB	NB	SB
Directions Served	LR	L	R
Maximum Queue (ft)	70	57	4
Average Queue (ft)	21	16	0
95th Queue (ft)	60	44	4
Link Distance (ft)	950		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		200	140
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Benns Church Boulevard & Site Driveway #1

Movement	EB
Directions Served	R
Maximum Queue (ft)	70
Average Queue (ft)	25
95th Queue (ft)	49
Link Distance (ft)	377
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Benns Church Boulevard & Site Driveway #2

Movement	EB	NB	NB
Directions Served	R	T	T
Maximum Queue (ft)	63	269	239
Average Queue (ft)	25	49	26
95th Queue (ft)	50	188	143
Link Distance (ft)	325	1039	1039
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	EB	NB
Directions Served	R	L
Maximum Queue (ft)	92	44
Average Queue (ft)	32	10
95th Queue (ft)	68	34
Link Distance (ft)	751	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Site Driveway #4 & Tractor Supply Entrance

Movement	NB
Directions Served	LR
Maximum Queue (ft)	34
Average Queue (ft)	6
95th Queue (ft)	27
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: Site Driveway #5 & Turner Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 10: Tractor Supply Entrance & Site Driveway #6

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 11: Site Driveway #3 & Site Driveway #5

Movement	SB
Directions Served	LR
Maximum Queue (ft)	51
Average Queue (ft)	24
95th Queue (ft)	49
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Benns Church Boulevard & Site Driveway #7

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

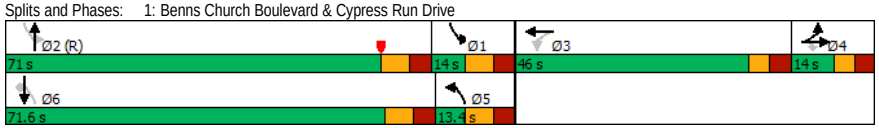
Network Summary

Network wide Queuing Penalty: 311

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	86	53	0	42	77	1139	2	56	1357	40
Future Volume (vph)	62	0	86	53	0	42	77	1139	2	56	1357	40
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.940							0.850
Flt Protected		0.950			0.973		0.950			0.950		
Satd. Flow (prot)	0	1492	1495	0	1360	0	1641	3374	0	1805	3471	1509
Flt Permitted		0.950			0.122		0.077			0.145		
Satd. Flow (perm)	0	1492	1495	0	171	0	133	3374	0	276	3471	1509
Satd. Flow (RTOR)			157		155							145
Adj. Flow (vph)	65	0	90	55	0	44	80	1186	2	58	1414	42
Lane Group Flow (vph)	0	65	90	0	99	0	80	1188	0	58	1414	42
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Total Split (s)	14.0	14.0	14.0	46.0	46.0		13.4	71.0		14.0	71.6	71.6
Total Lost Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		9.7	9.7		25.5		79.0	76.2		80.7	74.0	74.0
Actuated g/C Ratio		0.07	0.07		0.18		0.54	0.53		0.56	0.51	0.51
v/c Ratio		0.65	0.37		0.63		0.65	0.67		0.27	0.80	0.05
Control Delay		93.8	4.2		18.4		56.5	39.3		24.1	35.7	0.1
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		93.8	4.2		18.4		56.5	39.3		24.1	35.7	0.1
LOS		F	A		B		E	D		C	D	A
Approach Delay		41.7			18.4			40.4			34.3	
Approach LOS		D			B			D			C	

Intersection Summary			
Cycle Length: 145			
Actuated Cycle Length: 145			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 36.7		Intersection LOS: D	
Intersection Capacity Utilization 73.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	86	53	0	42	77	1139	2	56	1357	40
Future Volume (vph)	62	0	86	53	0	42	77	1139	2	56	1357	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1492	1495		1360		1641	3373		1805	3471	1509
Flt Permitted		0.95	1.00		0.12		0.08	1.00		0.14	1.00	1.00
Satd. Flow (perm)		1492	1495		171		134	3373		275	3471	1509
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	65	0	90	55	0	44	80	1186	2	58	1414	42
RTOR Reduction (vph)	0	0	84	0	82	0	0	0	0	0	0	21
Lane Group Flow (vph)	0	65	6	0	17	0	80	1188	0	58	1414	21
Heavy Vehicles (%)	21%	0%	8%	50%	0%	0%	10%	7%	0%	0%	4%	7%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Actuated Green, G (s)		9.7	9.7		25.5		79.1	74.6		79.1	72.4	72.4
Effective Green, g (s)		9.7	9.7		25.5		79.1	74.6		79.1	72.4	72.4
Actuated g/C Ratio		0.07	0.07		0.18		0.55	0.51		0.55	0.50	0.50
Clearance Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0		3.0		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		99	100		30		142	1735		197	1733	753
v/s Ratio Prot		c0.04					c0.03	0.35		0.01	c0.41	
v/s Ratio Perm			0.00		c0.10		0.28			0.15		0.01
v/c Ratio		0.66	0.06		0.58		0.56	0.68		0.29	0.82	0.03
Uniform Delay, d1		66.0	63.4		54.8		52.0	26.4		35.7	30.7	18.4
Progression Factor		1.00	1.00		1.00		0.96	1.30		1.00	1.00	1.00
Incremental Delay, d2		14.6	0.3		25.4		2.5	1.9		0.3	4.4	0.1
Delay (s)		80.6	63.6		80.3		52.5	36.3		36.0	35.0	18.5
Level of Service		F	E		F		D	D		D	D	B
Approach Delay (s)		70.8			80.3			37.3			34.6	
Approach LOS		E			F			D			C	

Intersection Summary				
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	30.7	
Intersection Capacity Utilization	73.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	81	0	1218	1389	107
Future Volume (vph)	0	81	0	1218	1389	107
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3374	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3374	3471	1583
Adj. Flow (vph)	0	88	0	1324	1510	116
Lane Group Flow (vph)	0	88	0	1324	1510	116
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	81	0	1218	1389	107
Future Volume (Veh/h)	0	81	0	1218	1389	107
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	88	0	1324	1510	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.65	0.65	0.65			
vC, conflicting volume	2172	755	1626			
vC1, stage 1 conf vol	1510					
vC2, stage 2 conf vol	662					
vCu, unblocked vol	1735	0	900			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	88	100			
cM capacity (veh/h)	186	710	491			

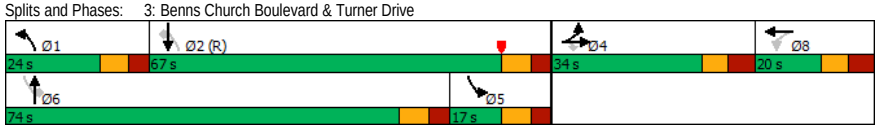
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	88	662	662	755	755	116
Volume Left	0	0	0	0	0	0
Volume Right	88	0	0	0	0	116
cSH	710	1700	1700	1700	1700	1700
Volume to Capacity	0.12	0.39	0.39	0.44	0.44	0.07
Queue Length 95th (ft)	11	0	0	0	0	0
Control Delay (s)	10.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	10.8	0.0		0.0		
Approach LOS	B					

Intersection Summary					
Average Delay		0.3			
Intersection Capacity Utilization		50.1%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	399	20	261	10	4	2	380	773	40	4	1160	296
Future Volume (vph)	399	20	261	10	4	2	380	773	40	4	1160	296
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.985				0.850			0.850
Flt Protected	0.950	0.957			0.970		0.950			0.950		
Satd. Flow (prot)	1531	1558	1524	0	1815	0	3335	3438	1615	1805	3505	1538
Flt Permitted	0.950	0.957			0.674		0.064			0.264		
Satd. Flow (perm)	1531	1558	1524	0	1261	0	225	3438	1615	502	3505	1538
Satd. Flow (RTOR)			297		2				175			246
Adj. Flow (vph)	453	23	297	11	5	2	432	878	45	5	1318	336
Lane Group Flow (vph)	236	240	297	0	18	0	432	878	45	5	1318	336
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2		6	6		2
Total Split (s)	34.0	34.0	34.0	20.0	20.0		24.0	74.0	74.0	17.0	67.0	67.0
Total Lost Time (s)	9.0	9.0	9.0		9.0		8.3	8.3	8.3	8.3	8.3	8.3
Act Effct Green (s)	24.7	24.7	24.7		8.0		84.0	88.9	88.9	90.7	65.7	65.7
Actuated g/C Ratio	0.17	0.17	0.17		0.06		0.58	0.61	0.61	0.63	0.45	0.45
v/c Ratio	0.91	0.91	0.59		0.25		0.82	0.42	0.04	0.01	0.83	0.40
Control Delay	94.7	94.1	10.5		68.4		44.8	17.7	0.3	4.0	28.1	4.6
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.7	94.1	10.5		68.4		44.8	17.7	0.3	4.0	28.1	4.6
LOS	F	F	B		E		D	B	A	A	C	A
Approach Delay		62.2			68.4			25.8			23.3	
Approach LOS		E			E			C			C	

Intersection Summary			
Cycle Length: 145			
Actuated Cycle Length: 145			
Offset: 49 (34%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 32.3		Intersection LOS: C	
Intersection Capacity Utilization 80.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	399	20	261	10	4	2	380	773	40	4	1160	296
Future Volume (vph)	399	20	261	10	4	2	380	773	40	4	1160	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	9.0	9.0	9.0		9.0		8.3	8.3	8.3	8.3	8.3	8.3
Lane Util. Factor	0.95	0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1531	1558	1524		1816		3335	3438	1615	1805	3505	1538
Flt Permitted	0.95	0.96	1.00		0.67		0.06	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	1531	1558	1524		1261		226	3438	1615	501	3505	1538
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	453	23	297	11	5	2	432	878	45	5	1318	336
RTOR Reduction (vph)	0	0	246	0	2	0	0	0	21	0	0	141
Lane Group Flow (vph)	236	240	51	0	16	0	432	878	24	5	1318	195
Heavy Vehicles (%)	12%	0%	6%	0%	0%	0%	5%	5%	0%	0%	3%	5%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2		6	6		2
Actuated Green, G (s)	24.7	24.7	24.7		5.2		80.5	78.8	78.8	80.5	62.1	62.1
Effective Green, g (s)	24.7	24.7	24.7		5.2		80.5	78.8	78.8	80.5	62.1	62.1
Actuated g/C Ratio	0.17	0.17	0.17		0.04		0.56	0.54	0.54	0.56	0.43	0.43
Clearance Time (s)	9.0	9.0	9.0		9.0		8.3	8.3	8.3	8.3	8.3	8.3
Vehicle Extension (s)	5.0	5.0	5.0		3.0		4.0	6.0	6.0	2.0	6.0	6.0
Lane Grp Cap (vph)	260	265	259		45		519	1868	877	293	1501	658
v/s Ratio Prot	c0.15	0.15					c0.11	0.26		0.00	c0.38	
v/s Ratio Perm			0.03		c0.01		0.36		0.02	0.01		0.13
v/c Ratio	0.91	0.91	0.20		0.36		0.83	0.47	0.03	0.02	0.88	0.30
Uniform Delay, d1	59.0	59.0	51.6		68.3		43.3	20.3	15.3	21.7	38.0	27.2
Progression Factor	1.00	1.00	1.00		1.00		0.79	1.01	1.00	0.31	0.64	0.43
Incremental Delay, d2	33.8	33.0	0.8		4.8		10.7	0.8	0.1	0.0	6.2	0.9
Delay (s)	92.8	92.0	52.4		73.1		44.9	21.2	15.4	6.7	30.6	12.6
Level of Service	F	F	D		E		D	C	B	A	C	B
Approach Delay (s)		77.0			73.1			28.6			26.9	
Approach LOS		E			E			C			C	

Intersection Summary					
HCM 2000 Control Delay		37.9	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio		0.85			
Actuated Cycle Length (s)		145.0	Sum of lost time (s)		34.6
Intersection Capacity Utilization		80.6%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	20	13	1335	1624	19
Future Volume (vph)	12	20	13	1335	1624	19
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.915					0.850
Flt Protected	0.982		0.950			
Satd. Flow (prot)	1697	0	1787	3406	3471	1599
Flt Permitted	0.982		0.950			
Satd. Flow (perm)	1697	0	1787	3406	3471	1599
Adj. Flow (vph)	13	22	14	1467	1785	21
Lane Group Flow (vph)	35	0	14	1467	1785	21
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 54.9%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	20	13	1335	1624	19
Future Volume (Veh/h)	12	20	13	1335	1624	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	13	22	14	1467	1785	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					932	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	2546	892	1806			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2437	386	1519			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	38	96	96			
cM capacity (veh/h)	21	496	355			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	35	14	734	734	892	892	21
Volume Left	13	14	0	0	0	0	0
Volume Right	22	0	0	0	0	0	21
cSH	52	355	1700	1700	1700	1700	1700
Volume to Capacity	0.67	0.04	0.43	0.43	0.53	0.53	0.01
Queue Length 95th (ft)	67	3	0	0	0	0	0
Control Delay (s)	161.0	15.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C					
Approach Delay (s)	161.0	0.1			0.0		
Approach LOS	F						

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	54.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	85	0	1217	1373	99
Future Volume (vph)	0	85	0	1217	1373	99
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3374	3438	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3374	3438	1583
Adj. Flow (vph)	0	89	0	1281	1445	104
Lane Group Flow (vph)	0	89	0	1281	1445	104
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	85	0	1217	1373	99
Future Volume (Veh/h)	0	85	0	1217	1373	99
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	89	0	1281	1445	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				844		
pX, platoon unblocked	0.85					
vC, conflicting volume	2086	722	1549			
vC1, stage 1 conf vol	1445					
vC2, stage 2 conf vol	640					
vCu, unblocked vol	1922	722	1549			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	76	100			
cM capacity (veh/h)	174	369	424			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	89	640	640	722	722	104
Volume Left	0	0	0	0	0	0
Volume Right	89	0	0	0	0	104
cSH	369	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.38	0.38	0.42	0.42	0.06
Queue Length 95th (ft)	23	0	0	0	0	0
Control Delay (s)	17.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	17.8	0.0		0.0		
Approach LOS	C					

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	49.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	76	0	1151	1372	73
Future Volume (vph)	0	76	0	1151	1372	73
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	4893	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	4893	3471	1583
Adj. Flow (vph)	0	80	0	1212	1444	77
Lane Group Flow (vph)	0	80	0	1212	1444	77
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	76	0	1151	1372	73
Future Volume (Veh/h)	0	76	0	1151	1372	73
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	80	0	1212	1444	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				1022	428	
pX, platoon unblocked	0.70	0.66	0.66			
vC, conflicting volume	1848	722	1521			
vC1, stage 1 conf vol	1444					
vC2, stage 2 conf vol	404					
vCu, unblocked vol	700	0	753			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	89	100			
cM capacity (veh/h)	314	714	561			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	80	404	404	404	722	722	77
Volume Left	0	0	0	0	0	0	0
Volume Right	80	0	0	0	0	0	77
cSH	714	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.24	0.24	0.24	0.42	0.42	0.05
Queue Length 95th (ft)	9	0	0	0	0	0	0
Control Delay (s)	10.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.7	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	49.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	0	275	267	0	132	274	981	92	94	1099	239
Future Volume (vph)	79	0	275	267	0	132	274	981	92	94	1099	239
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	3433	1583	0	1770	3406	1583	1770	3471	1583
Flt Permitted	0.950			0.950			0.167			0.228		
Satd. Flow (perm)	1770	1583	0	3433	1583	0	311	3406	1583	425	3471	1583
Satd. Flow (RTOR)		262			242				97			252
Adj. Flow (vph)	83	0	289	281	0	139	288	1033	97	99	1157	252
Lane Group Flow (vph)	83	289	0	281	139	0	288	1033	97	99	1157	252
Turn Type	Prot	NA		Prot	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6		2	2		6
Total Split (s)	17.0	23.0		19.0	25.0		30.0	87.0	87.0	16.0	73.0	73.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	11.2	10.3		14.6	13.7		104.1	96.3	96.3	104.1	84.6	84.6
Actuated g/C Ratio	0.08	0.07		0.10	0.09		0.72	0.66	0.66	0.72	0.58	0.58
v/c Ratio	0.61	0.81		0.81	0.38		0.69	0.46	0.09	0.26	0.57	0.25
Control Delay	83.5	28.2		82.4	2.9		20.7	13.4	2.4	10.1	42.7	16.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	28.2		82.4	2.9		20.7	13.4	2.4	10.1	42.7	16.4
LOS	F	C		F	A		C	B	A	B	D	B
Approach Delay		40.5			56.1			14.2			36.2	
Approach LOS		D			E			B			D	

Intersection Summary			
Cycle Length: 145			
Actuated Cycle Length: 145			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 30.5		Intersection LOS: C	
Intersection Capacity Utilization 83.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 7: Benns Church Boulevard & Site Driveway #3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	0	275	267	0	132	274	981	92	94	1099	239
Future Volume (vph)	79	0	275	267	0	132	274	981	92	94	1099	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		3433	1583		1770	3406	1583	1770	3471	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.17	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	1770	1583		3433	1583		311	3406	1583	425	3471	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	0	289	281	0	139	288	1033	97	99	1157	252
RTOR Reduction (vph)	0	243	0	0	126	0	0	0	33	0	0	105
Lane Group Flow (vph)	83	46	0	281	13	0	288	1033	64	99	1157	147
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	6%	2%	2%	4%	2%
Turn Type	Prot	NA		Prot	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6		2	2		6
Actuated Green, G (s)	11.2	10.3		14.6	13.7		104.1	96.3	96.3	104.1	84.6	84.6
Effective Green, g (s)	11.2	10.3		14.6	13.7		104.1	96.3	96.3	104.1	84.6	84.6
Actuated g/C Ratio	0.08	0.07		0.10	0.09		0.72	0.66	0.66	0.72	0.58	0.58
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	136	112		345	149		419	2262	1051	377	2025	923
v/s Ratio Prot	0.05	c0.03		c0.08	c0.01		c0.09	0.30		0.01	0.33	
v/s Ratio Perm							c0.40		0.04	0.17		0.09
v/c Ratio	0.61	0.41		0.81	0.09		0.69	0.46	0.06	0.26	0.57	0.16
Uniform Delay, d1	64.8	64.4		63.9	59.9		13.6	11.7	8.5	7.4	18.9	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.52	2.00	7.07
Incremental Delay, d2	7.9	2.4		13.7	0.3		4.6	0.7	0.1	0.2	0.8	0.2
Delay (s)	72.6	66.8		77.6	60.2		18.3	12.4	8.6	11.4	38.6	98.3
Level of Service	E	E		E	E		B	B	A	B	D	F
Approach Delay (s)		68.1			71.8			13.3			46.8	
Approach LOS		E			E			B			D	

Intersection Summary					
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	83.5%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

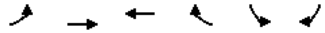
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	12	12	73	9	5	57
Future Volume (vph)	12	12	73	9	5	57
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.875	
Flt Protected				0.958	0.996	
Satd. Flow (prot)	1736	0	0	1785	1623	0
Flt Permitted				0.958	0.996	
Satd. Flow (perm)	1736	0	0	1785	1623	0
Adj. Flow (vph)	13	13	79	10	5	62
Lane Group Flow (vph)	26	0	0	89	67	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 21.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	12	12	73	9	5	57
Future Volume (Veh/h)	12	12	73	9	5	57
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	13	79	10	5	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			26		188	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			26		188	20
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		99	94
cM capacity (veh/h)			1588		762	1058

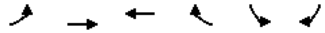
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	26	89	67
Volume Left	0	79	5
Volume Right	13	0	62
cSH	1700	1588	1029
Volume to Capacity	0.02	0.05	0.07
Queue Length 95th (ft)	0	4	5
Control Delay (s)	0.0	6.6	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	6.6	8.7
Approach LOS			A

Intersection Summary				
Average Delay		6.4		
Intersection Capacity Utilization		21.7%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	14	23	0
Future Volume (vph)	0	0	0	14	23	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	0
Adj. Flow (vph)	0	0	0	15	25	0
Lane Group Flow (vph)	0	0	15	0	25	0
Sign Control		Free	Free		Stop	

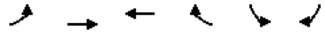
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	14	23	0
Future Volume (Veh/h)	0	0	0	14	23	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	15	25	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	15				8	8
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	15				8	8
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	1603				1013	1075

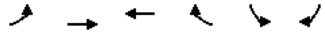
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	15	25
Volume Left	0	0	25
Volume Right	0	15	0
cSH	1700	1700	1013
Volume to Capacity	0.00	0.01	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

Intersection Summary				
Average Delay		5.4		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	158	316	0	106	0
Future Volume (vph)	0	158	316	0	106	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	0
Adj. Flow (vph)	0	172	343	0	115	0
Lane Group Flow (vph)	0	172	343	0	115	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 29.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	158	316	0	106	0
Future Volume (Veh/h)	0	158	316	0	106	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	172	343	0	115	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			837			
pX, platoon unblocked						
vC, conflicting volume	343				515	343
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343				515	343
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				78	100
cM capacity (veh/h)	1216				520	700

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	172	343	115
Volume Left	0	0	115
Volume Right	0	0	0
cSH	1216	1700	520
Volume to Capacity	0.00	0.20	0.22
Queue Length 95th (ft)	0	0	21
Control Delay (s)	0.0	0.0	13.9
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.9
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	33	997	37	0	1356
Future Volume (vph)	0	33	997	37	0	1356
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	3539	1583	0	3539
Flt Permitted						
Satd. Flow (perm)	0	1611	3539	1583	0	3539
Adj. Flow (vph)	0	36	1084	40	0	1474
Lane Group Flow (vph)	0	36	1084	40	0	1474
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	33	997	37	0	1356
Future Volume (Veh/h)	0	33	997	37	0	1356
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	36	1084	40	0	1474
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						315
pX, platoon unblocked	0.80					
vC, conflicting volume	1821	542			1124	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1521	542			1124	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			100	
cM capacity (veh/h)	87	485			617	

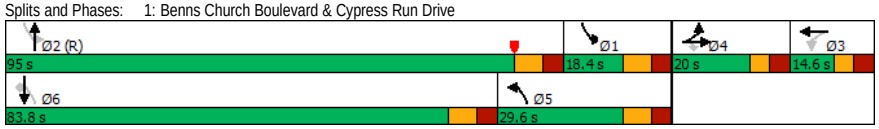
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	36	542	542	40	737	737
Volume Left	0	0	0	0	0	0
Volume Right	36	0	0	40	0	0
cSH	485	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.32	0.32	0.02	0.43	0.43
Queue Length 95th (ft)	6	0	0	0	0	0
Control Delay (s)	13.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	13.0	0.0			0.0	
Approach LOS	B					

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	40.8%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	0	132	50	4	76	283	1515	0	62	1551	147
Future Volume (vph)	136	0	132	50	4	76	283	1515	0	62	1551	147
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.921							0.850
Flt Protected		0.950			0.981		0.950			0.950		
Satd. Flow (prot)	0	1805	1615	0	1717	0	1805	3539	0	1805	3471	1553
Flt Permitted		0.950			0.815		0.054			0.088		
Satd. Flow (perm)	0	1805	1615	0	1426	0	103	3539	0	167	3471	1553
Satd. Flow (RTOR)			216		36							204
Adj. Flow (vph)	139	0	135	51	4	78	289	1546	0	63	1583	150
Lane Group Flow (vph)	0	139	135	0	133	0	289	1546	0	63	1583	150
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Total Split (s)	20.0	20.0	20.0	14.6	14.6		29.6	95.0		18.4	83.8	83.8
Total Lost Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		13.0	13.0		8.2		96.1	89.8		97.8	75.4	75.4
Actuated g/C Ratio		0.09	0.09		0.06		0.65	0.61		0.66	0.51	0.51
v/c Ratio		0.88	0.40		1.19		0.95	0.72		0.30	0.90	0.17
Control Delay		111.0	3.5		183.1		79.1	33.0		17.6	40.7	1.0
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		111.0	3.5		183.1		79.1	33.0		17.6	40.7	1.0
LOS		F	A		F		E	C		B	D	A
Approach Delay		58.0			183.1			40.2			36.6	
Approach LOS		E			F			D			D	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 44.5		Intersection LOS: D	
Intersection Capacity Utilization 92.8%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	0	132	50	4	76	283	1515	0	62	1551	147
Future Volume (vph)	136	0	132	50	4	76	283	1515	0	62	1551	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1805	1615		1717		1805	3539		1805	3471	1553
Flt Permitted		0.95	1.00		0.81		0.05	1.00		0.09	1.00	1.00
Satd. Flow (perm)		1805	1615		1425		103	3539		168	3471	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	139	0	135	51	4	78	289	1546	0	63	1583	150
RTOR Reduction (vph)	0	0	123	0	34	0	0	0	0	0	0	75
Lane Group Flow (vph)	0	139	12	0	99	0	289	1546	0	63	1583	75
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	4%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3			6			2		6
Actuated Green, G (s)		13.0	13.0		8.2		96.1	88.1		96.1	73.7	73.7
Effective Green, g (s)		13.0	13.0		8.2		96.1	88.1		96.1	73.7	73.7
Actuated g/C Ratio		0.09	0.09		0.06		0.65	0.60		0.65	0.50	0.50
Clearance Time (s)		6.8	6.8		7.1		8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0		3.0		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		158	141		78		324	2106		197	1728	773
v/s Ratio Prot		c0.08					c0.13	0.44		0.02	c0.46	
v/s Ratio Perm			0.01		c0.07		0.44			0.19		0.05
v/c Ratio		0.88	0.08		1.27		0.89	0.73		0.32	0.92	0.10
Uniform Delay, d1		66.7	62.0		69.9		52.0	21.5		36.5	34.3	19.6
Progression Factor		1.00	1.00		1.00		0.92	1.47		1.00	1.00	1.00
Incremental Delay, d2		38.5	0.3		190.4		17.7	1.5		0.3	9.2	0.2
Delay (s)		105.3	62.3		260.3		65.5	33.2		36.8	43.4	19.8
Level of Service		F	E		F		E	C		D	D	B
Approach Delay (s)		84.1			260.3			38.3			41.2	
Approach LOS		F			F			D			D	

Intersection Summary					
HCM 2000 Control Delay		50.0	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio		0.93			
Actuated Cycle Length (s)		148.0	Sum of lost time (s)		30.7
Intersection Capacity Utilization		92.8%	ICU Level of Service		F
Analysis Period (min)		15			
c Critical Lane Group					



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	71	0	1798	1628	106
Future Volume (vph)	0	71	0	1798	1628	106
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3471	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3471	1583
Adj. Flow (vph)	0	77	0	1954	1770	115
Lane Group Flow (vph)	0	77	0	1954	1770	115
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	71	0	1798	1628	106
Future Volume (Veh/h)	0	71	0	1798	1628	106
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	77	0	1954	1770	115
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.57	0.57	0.57			
vC, conflicting volume	2747	885	1885			
vC1, stage 1 conf vol	1770					
vC2, stage 2 conf vol	977					
vCu, unblocked vol	2557	0	1049			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	88	100			
cM capacity (veh/h)	124	620	377			

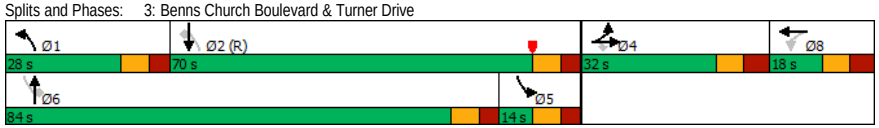
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	77	977	977	885	885	115
Volume Left	0	0	0	0	0	0
Volume Right	77	0	0	0	0	115
cSH	620	1700	1700	1700	1700	1700
Volume to Capacity	0.12	0.57	0.57	0.52	0.52	0.07
Queue Length 95th (ft)	11	0	0	0	0	0
Control Delay (s)	11.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	11.6	0.0		0.0		
Approach LOS	B					

Intersection Summary					
Average Delay		0.2			
Intersection Capacity Utilization		56.1%	ICU Level of Service		B
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	9	165	46	22	9	373	1470	18	30	1408	252
Future Volume (vph)	334	9	165	46	22	9	373	1470	18	30	1408	252
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.985				0.850			0.850
Flt Protected	0.950	0.955			0.971		0.950			0.950		
Satd. Flow (prot)	1698	1708	1599	0	1817	0	3335	3539	1615	1805	3539	1615
Flt Permitted	0.950	0.955			0.710		0.062			0.063		
Satd. Flow (perm)	1698	1708	1599	0	1329	0	218	3539	1615	120	3539	1615
Satd. Flow (RTOR)			228		3				172			173
Adj. Flow (vph)	352	9	174	48	23	9	393	1547	19	32	1482	265
Lane Group Flow (vph)	180	181	174	0	80	0	393	1547	19	32	1482	265
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2		6	6		2
Total Split (s)	32.0	32.0	32.0	18.0	18.0		28.0	84.0	84.0	14.0	70.0	70.0
Total Lost Time (s)	9.0	9.0	9.0		9.0		8.3	8.3	8.3	8.3	8.3	8.3
Act Effct Green (s)	21.0	21.0	21.0		10.2		82.2	82.1	82.1	85.5	64.3	64.3
Actuated g/C Ratio	0.14	0.14	0.14		0.07		0.56	0.55	0.55	0.58	0.43	0.43
v/c Ratio	0.75	0.75	0.41		0.85		0.79	0.79	0.02	0.25	0.96	0.33
Control Delay	80.0	79.8	4.8		122.7		51.2	14.8	0.0	9.2	40.0	5.0
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.0	79.8	4.8		122.7		51.2	14.8	0.0	9.2	40.0	5.0
LOS	E	E	A		F		D	B	A	A	D	A
Approach Delay		55.5			122.7			22.0			34.2	
Approach LOS		E			F			C			C	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 38 (26%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 33.0		Intersection LOS: C	
Intersection Capacity Utilization 85.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	9	165	46	22	9	373	1470	18	30	1408	252
Future Volume (vph)	334	9	165	46	22	9	373	1470	18	30	1408	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	9.0	9.0	9.0		9.0		8.3	8.3	8.3	8.3	8.3	8.3
Lane Util. Factor	0.95	0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1698	1707	1599		1817		3335	3539	1615	1805	3539	1615
Flt Permitted	0.95	0.95	1.00		0.71		0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1698	1707	1599		1328		218	3539	1615	119	3539	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	352	9	174	48	23	9	393	1547	19	32	1482	265
RTOR Reduction (vph)	0	0	149	0	3	0	0	0	9	0	0	98
Lane Group Flow (vph)	180	181	25	0	77	0	393	1547	10	32	1482	167
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	5%	2%	0%	0%	2%	0%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2		6	6		2
Actuated Green, G (s)	21.0	21.0	21.0		10.2		82.2	78.8	78.8	82.2	64.3	64.3
Effective Green, g (s)	21.0	21.0	21.0		10.2		82.2	78.8	78.8	82.2	64.3	64.3
Actuated g/C Ratio	0.14	0.14	0.14		0.07		0.56	0.53	0.53	0.56	0.43	0.43
Clearance Time (s)	9.0	9.0	9.0		9.0		8.3	8.3	8.3	8.3	8.3	8.3
Vehicle Extension (s)	5.0	5.0	5.0		3.0		4.0	6.0	6.0	2.0	6.0	6.0
Lane Grp Cap (vph)	240	242	226		91		498	1884	859	104	1537	701
v/s Ratio Prot	0.11	c0.11					0.10	c0.44		0.01	c0.42	
v/s Ratio Perm			0.02		c0.06		0.34		0.01	0.16		0.10
v/c Ratio	0.75	0.75	0.11		0.85		0.79	0.82	0.01	0.31	0.96	0.24
Uniform Delay, d1	61.0	61.0	55.3		68.1		44.3	28.7	16.3	49.5	40.7	26.4
Progression Factor	1.00	1.00	1.00		1.00		1.09	0.46	1.00	0.30	0.66	0.43
Incremental Delay, d2	14.5	14.1	0.4		48.2		5.5	2.6	0.0	0.4	11.8	0.5
Delay (s)	75.5	75.1	55.8		116.4		54.0	15.8	16.3	15.3	38.8	11.9
Level of Service	E	E	E		F		D	B	B	B	D	B
Approach Delay (s)		69.0			116.4			23.4			34.4	
Approach LOS		E			F			C			C	

Intersection Summary					
HCM 2000 Control Delay		35.2	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio		0.93			
Actuated Cycle Length (s)		148.0	Sum of lost time (s)		34.6
Intersection Capacity Utilization		85.0%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	16	30	1930	1688	23
Future Volume (vph)	10	16	30	1930	1688	23
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.915					0.850
Flt Protected	0.982		0.950			
Satd. Flow (prot)	1707	0	1736	3539	3505	1615
Flt Permitted	0.982		0.950			
Satd. Flow (perm)	1707	0	1736	3539	3505	1615
Adj. Flow (vph)	10	17	31	2010	1758	24
Lane Group Flow (vph)	27	0	31	2010	1758	24
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 63.4%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	16	30	1930	1688	23
Future Volume (Veh/h)	10	16	30	1930	1688	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	10	17	31	2010	1758	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					932	
pX, platoon unblocked	0.80	0.80	0.80			
vC, conflicting volume	2825	879	1782			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2781	349	1478			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	12	97	91			
cM capacity (veh/h)	11	522	354			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	27	31	1005	1005	879	879	24
Volume Left	10	31	0	0	0	0	0
Volume Right	17	0	0	0	0	0	24
cSH	30	354	1700	1700	1700	1700	1700
Volume to Capacity	0.91	0.09	0.59	0.59	0.52	0.52	0.01
Queue Length 95th (ft)	76	7	0	0	0	0	0
Control Delay (s)	330.7	16.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C					
Approach Delay (s)	330.7	0.2			0.0		
Approach LOS	F						

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	63.4%	ICU Level of Service		B
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	67	0	1792	1619	85
Future Volume (vph)	0	67	0	1792	1619	85
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3539	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3539	1583
Adj. Flow (vph)	0	71	0	1886	1704	89
Lane Group Flow (vph)	0	71	0	1886	1704	89
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	67	0	1792	1619	85
Future Volume (Veh/h)	0	67	0	1792	1619	85
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	71	0	1886	1704	89
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				844		
pX, platoon unblocked	0.62					
vC, conflicting volume	2647	852	1793			
vC1, stage 1 conf vol	1704					
vC2, stage 2 conf vol	943					
vCu, unblocked vol	2432	852	1793			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	77	100			
cM capacity (veh/h)	126	303	341			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	71	943	943	852	852	89
Volume Left	0	0	0	0	0	0
Volume Right	71	0	0	0	0	89
cSH	303	1700	1700	1700	1700	1700
Volume to Capacity	0.23	0.55	0.55	0.50	0.50	0.05
Queue Length 95th (ft)	22	0	0	0	0	0
Control Delay (s)	20.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	20.5	0.0		0.0		
Approach LOS	C					

Intersection Summary					
Average Delay		0.4			
Intersection Capacity Utilization		55.6%	ICU Level of Service		B
Analysis Period (min)		15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	58	0	1824	1579	49
Future Volume (vph)	0	58	0	1824	1579	49
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	5085	3539	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	5085	3539	1583
Adj. Flow (vph)	0	61	0	1920	1662	52
Lane Group Flow (vph)	0	61	0	1920	1662	52
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	58	0	1824	1579	49
Future Volume (Veh/h)	0	58	0	1824	1579	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	61	0	1920	1662	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				1022	428	
pX, platoon unblocked	0.75	0.59	0.59			
vC, conflicting volume	2302	831	1714			
vC1, stage 1 conf vol	1662					
vC2, stage 2 conf vol	640					
vCu, unblocked vol	0	0	809			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	90	100			
cM capacity (veh/h)	770	636	477			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	61	640	640	640	831	831	52
Volume Left	0	0	0	0	0	0	0
Volume Right	61	0	0	0	0	0	52
cSH	636	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.38	0.38	0.38	0.49	0.49	0.03
Queue Length 95th (ft)	8	0	0	0	0	0	0
Control Delay (s)	11.3	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.3	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		53.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	0	187	227	0	145	106	1625	208	231	1294	101
Future Volume (vph)	92	0	187	227	0	145	106	1625	208	231	1294	101
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	3433	1583	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.143			0.049		
Satd. Flow (perm)	1770	1583	0	3433	1583	0	266	3539	1583	91	3539	1583
Satd. Flow (RTOR)		155			173				181			106
Adj. Flow (vph)	97	0	197	239	0	153	112	1711	219	243	1362	106
Lane Group Flow (vph)	97	197	0	239	153	0	112	1711	219	243	1362	106
Turn Type	Prot	NA		Prot	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6		2	2		6
Total Split (s)	19.0	20.0		19.0	20.0		15.0	89.0	89.0	20.0	94.0	94.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	12.6	10.1		14.1	11.6		107.8	87.3	87.3	107.8	99.7	99.7
Actuated g/C Ratio	0.09	0.07		0.10	0.08		0.73	0.59	0.59	0.73	0.67	0.67
v/c Ratio	0.65	0.78		0.74	0.54		0.41	0.82	0.22	0.82	0.57	0.10
Control Delay	84.6	37.9		78.9	12.9		10.0	28.8	3.7	33.6	39.4	13.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.6	37.9		78.9	12.9		10.0	28.8	3.7	33.6	39.4	13.1
LOS	F	D		E	B		A	C	A	C	D	B
Approach Delay		53.3			53.1			25.1			37.0	
Approach LOS		D			D			C			D	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 34.0		Intersection LOS: C	
Intersection Capacity Utilization 89.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 7: Benns Church Boulevard & Site Driveway #3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	0	187	227	0	145	106	1625	208	231	1294	101
Future Volume (vph)	92	0	187	227	0	145	106	1625	208	231	1294	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		3433	1583		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.14	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1770	1583		3433	1583		267	3539	1583	91	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	0	197	239	0	153	112	1711	219	243	1362	106
RTOR Reduction (vph)	0	144	0	0	141	0	0	0	74	0	0	35
Lane Group Flow (vph)	97	53	0	239	12	0	112	1711	145	243	1362	71
Turn Type	Prot	NA		Prot	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6		2	2		6
Actuated Green, G (s)	12.6	10.1		14.1	11.6		107.8	87.3	87.3	107.8	99.7	99.7
Effective Green, g (s)	12.6	10.1		14.1	11.6		107.8	87.3	87.3	107.8	99.7	99.7
Actuated g/C Ratio	0.09	0.07		0.10	0.08		0.73	0.59	0.59	0.73	0.67	0.67
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	108		327	124		276	2087	933	298	2384	1066
v/s Ratio Prot	0.05	c0.03		c0.07	0.01		0.02	c0.48		c0.11	0.38	
v/s Ratio Perm							0.27		0.09	0.48		0.05
v/c Ratio	0.65	0.49		0.73	0.10		0.41	0.82	0.16	0.82	0.57	0.07
Uniform Delay, d1	65.5	66.5		65.1	63.3		9.6	24.1	13.7	47.5	12.8	8.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.47	2.81	6.79
Incremental Delay, d2	9.2	3.4		8.2	0.3		1.0	3.8	0.4	8.0	0.5	0.1
Delay (s)	74.8	69.9		73.3	63.7		10.6	27.9	14.1	30.2	36.4	56.1
Level of Service	E	E		E	E		B	C	B	C	D	E
Approach Delay (s)		71.5			69.5			25.4			36.8	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	89.1%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

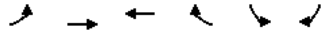
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	8	8	67	26	13	49
Future Volume (vph)	8	8	67	26	13	49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.893	
Flt Protected				0.965	0.990	
Satd. Flow (prot)	1736	0	0	1798	1647	0
Flt Permitted				0.965	0.990	
Satd. Flow (perm)	1736	0	0	1798	1647	0
Adj. Flow (vph)	9	9	73	28	14	53
Lane Group Flow (vph)	18	0	0	101	67	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	8	8	67	26	13	49
Future Volume (Veh/h)	8	8	67	26	13	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	9	73	28	14	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			18		188	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			18		188	14
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		98	95
cM capacity (veh/h)			1599		765	1067

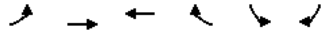
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	18	101	67
Volume Left	0	73	14
Volume Right	9	0	53
cSH	1700	1599	985
Volume to Capacity	0.01	0.05	0.07
Queue Length 95th (ft)	0	4	5
Control Delay (s)	0.0	5.4	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	5.4	8.9
Approach LOS			A

Intersection Summary				
Average Delay		6.2		
Intersection Capacity Utilization		22.2%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	39	16	0
Future Volume (vph)	0	0	0	39	16	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	0
Adj. Flow (vph)	0	0	0	42	17	0
Lane Group Flow (vph)	0	0	42	0	17	0
Sign Control		Free	Free		Stop	

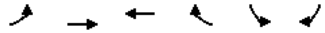
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	39	16	0
Future Volume (Veh/h)	0	0	0	39	16	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	42	17	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	42				21	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42				21	21
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	1567				996	1056

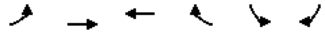
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	42	17
Volume Left	0	0	17
Volume Right	0	42	0
cSH	1700	1700	996
Volume to Capacity	0.00	0.02	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	142	0
Future Volume (vph)	0	0	0	0	142	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	0
Adj. Flow (vph)	0	0	0	0	154	0
Lane Group Flow (vph)	0	0	0	0	154	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 11.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	142	0
Future Volume (Veh/h)	0	0	0	0	142	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	154	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			837			
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	154
Volume Left	0	0	154
Volume Right	0	0	0
cSH	1700	1700	1023
Volume to Capacity	0.00	0.20	0.15
Queue Length 95th (ft)	0	0	13
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

Intersection Summary				
Average Delay		9.1		
Intersection Capacity Utilization		11.2%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	39	1665	116	0	1477
Future Volume (vph)	0	39	1665	116	0	1477
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	3539	1583	0	3539
Flt Permitted						
Satd. Flow (perm)	0	1611	3539	1583	0	3539
Adj. Flow (vph)	0	42	1810	126	0	1605
Lane Group Flow (vph)	0	42	1810	126	0	1605
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	39	1665	116	0	1477
Future Volume (Veh/h)	0	39	1665	116	0	1477
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	42	1810	126	0	1605
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						315
pX, platoon unblocked	0.80					
vC, conflicting volume	2612	905			1936	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2514	905			1936	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	85			100	
cM capacity (veh/h)	18	279			300	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	905	905	126	802	802
Volume Left	0	0	0	0	0	0
Volume Right	42	0	0	126	0	0
cSH	279	1700	1700	1700	1700	1700
Volume to Capacity	0.15	0.53	0.53	0.07	0.47	0.47
Queue Length 95th (ft)	13	0	0	0	0	0
Control Delay (s)	20.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	20.2	0.0			0.0	
Approach LOS	C					

Intersection Summary					
Average Delay		0.2			
Intersection Capacity Utilization	56.0%	ICU Level of Service			B
Analysis Period (min)	15				

MOVEMENT SUMMARY

Site: 101 [Turner Drive at Site Driveway #9 2045 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Site Driveway #5														
3	L2	42	2.0	46	2.0	0.336	9.8	LOS A	1.5	39.3	0.68	0.70	0.73	32.3
8	T1	21	2.0	23	2.0	0.336	9.8	LOS A	1.5	39.3	0.68	0.70	0.73	32.2
18	R2	144	2.0	157	2.0	0.336	9.8	LOS A	1.5	39.3	0.68	0.70	0.73	31.3
Approach		207	2.0	225	2.0	0.336	9.8	LOS A	1.5	39.3	0.68	0.70	0.73	31.6
East: Turner Drive														
1	L2	158	2.0	172	2.0	0.578	9.8	LOS A	4.8	121.6	0.46	0.26	0.46	23.5
6	T1	437	2.0	475	2.0	0.578	9.8	LOS A	4.8	121.6	0.46	0.26	0.46	23.1
16	R2	53	2.0	58	2.0	0.578	9.8	LOS A	4.8	121.6	0.46	0.26	0.46	22.5
Approach		648	2.0	704	2.0	0.578	9.8	LOS A	4.8	121.6	0.46	0.26	0.46	23.1
North: Site Driveway #5														
7	L2	83	2.0	90	2.0	0.208	7.9	LOS A	0.9	21.6	0.64	0.64	0.64	32.0
4	T1	10	2.0	11	2.0	0.208	7.9	LOS A	0.9	21.6	0.64	0.64	0.64	32.0
14	R2	33	2.0	36	2.0	0.208	7.9	LOS A	0.9	21.6	0.64	0.64	0.64	31.1
Approach		126	2.0	137	2.0	0.208	7.9	LOS A	0.9	21.6	0.64	0.64	0.64	31.8
West: Turner Drive														
5	L2	30	2.0	33	2.0	0.666	13.6	LOS B	9.1	230.1	0.75	0.89	1.13	22.9
2	T1	510	2.0	554	2.0	0.666	13.6	LOS B	9.1	230.1	0.75	0.89	1.13	22.4
12	R2	84	2.0	91	2.0	0.666	13.6	LOS B	9.1	230.1	0.75	0.89	1.13	21.9
Approach		624	2.0	678	2.0	0.666	13.6	LOS B	9.1	230.1	0.75	0.89	1.13	22.4
All Vehicles		1605	2.0	1745	2.0	0.666	11.1	LOS B	9.1	230.1	0.61	0.59	0.77	24.2

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.

MOVEMENT SUMMARY

Site: 101 [Turner Drive at Site Driveway #9 2045 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Site Driveway #5														
3	L2	38	2.0	41	2.0	0.221	6.7	LOS A	1.0	24.6	0.57	0.52	0.57	33.7
8	T1	19	2.0	21	2.0	0.221	6.7	LOS A	1.0	24.6	0.57	0.52	0.57	33.6
18	R2	110	2.0	120	2.0	0.221	6.7	LOS A	1.0	24.6	0.57	0.52	0.57	32.7
Approach		167	2.0	182	2.0	0.221	6.7	LOS A	1.0	24.6	0.57	0.52	0.57	33.0
East: Turner Drive														
1	L2	104	2.0	113	2.0	0.553	9.4	LOS A	4.3	110.1	0.45	0.26	0.45	23.7
6	T1	446	2.0	485	2.0	0.553	9.4	LOS A	4.3	110.1	0.45	0.26	0.45	23.3
16	R2	64	2.0	70	2.0	0.553	9.4	LOS A	4.3	110.1	0.45	0.26	0.45	22.7
Approach		614	2.0	667	2.0	0.553	9.4	LOS A	4.3	110.1	0.45	0.26	0.45	23.3
North: Site Driveway #5														
7	L2	106	2.0	115	2.0	0.231	7.9	LOS A	1.0	24.7	0.63	0.63	0.63	31.9
4	T1	11	2.0	12	2.0	0.231	7.9	LOS A	1.0	24.7	0.63	0.63	0.63	31.9
14	R2	31	2.0	34	2.0	0.231	7.9	LOS A	1.0	24.7	0.63	0.63	0.63	31.0
Approach		148	2.0	161	2.0	0.231	7.9	LOS A	1.0	24.7	0.63	0.63	0.63	31.7
West: Turner Drive														
5	L2	44	2.0	48	2.0	0.450	8.4	LOS A	2.7	69.0	0.54	0.42	0.54	24.0
2	T1	291	2.0	316	2.0	0.450	8.4	LOS A	2.7	69.0	0.54	0.42	0.54	23.5
12	R2	101	2.0	110	2.0	0.450	8.4	LOS A	2.7	69.0	0.54	0.42	0.54	23.0
Approach		436	2.0	474	2.0	0.450	8.4	LOS A	2.7	69.0	0.54	0.42	0.54	23.5
All Vehicles		1365	2.0	1484	2.0	0.553	8.6	LOS A	4.3	110.1	0.51	0.38	0.51	25.0

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.

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	194	162	247	204	368	364	149	474	508	245
Average Queue (ft)	68	48	96	65	172	179	45	229	261	33
95th Queue (ft)	147	115	192	148	321	323	118	411	439	153
Link Distance (ft)	656		676		798	798		1702	1702	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		180		255			150			245
Storage Blk Time (%)	1	0		0	3		0	14	9	0
Queuing Penalty (veh)	1	0		0	2		0	8	4	1

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB	SB
Directions Served	R	T
Maximum Queue (ft)	99	3
Average Queue (ft)	36	0
95th Queue (ft)	75	3
Link Distance (ft)	470	798
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	EB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	L	T	T	R	L	T	T
Maximum Queue (ft)	397	305	288	68	325	366	240	252	149	59	581	645
Average Queue (ft)	292	245	141	18	224	247	98	104	11	4	330	368
95th Queue (ft)	436	349	280	49	378	414	208	216	66	28	553	615
Link Distance (ft)	384			457		349	349	349			780	780
Upstream Blk Time (%)	10					14					0	0
Queuing Penalty (veh)	67					56					1	2
Storage Bay Dist (ft)		305	305		325				200	140		
Storage Blk Time (%)	14	3	0		2	18		1	0	0	26	12
Queuing Penalty (veh)	69	7	0		4	34		0	0	0	1	37

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	SB
Directions Served	R
Maximum Queue (ft)	280
Average Queue (ft)	187
95th Queue (ft)	361
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	280
Storage Blk Time (%)	1
Queuing Penalty (veh)	5

Intersection: 4: Benns Church Boulevard & Red Oak Drive

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	98	37
Average Queue (ft)	29	9
95th Queue (ft)	79	30
Link Distance (ft)	950	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Benns Church Boulevard & Site Driveway #1

Movement	EB	SB	SB	SB
Directions Served	R	T	T	R
Maximum Queue (ft)	104	27	34	20
Average Queue (ft)	39	2	5	1
95th Queue (ft)	79	37	53	29
Link Distance (ft)	377	472	472	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				200
Storage Blk Time (%)			0	0
Queuing Penalty (veh)			0	0

Intersection: 6: Benns Church Boulevard & Site Driveway #2

Movement	EB	NB	NB	NB
Directions Served	R	T	T	T
Maximum Queue (ft)	110	375	196	98
Average Queue (ft)	38	70	15	4
95th Queue (ft)	78	283	132	60
Link Distance (ft)	325	937	937	937
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	142	238	233	274	138	225	253	264	132	298	538	540
Average Queue (ft)	59	116	144	189	51	123	134	160	24	89	323	337
95th Queue (ft)	115	201	238	260	98	199	240	248	77	256	514	536
Link Distance (ft)		738			490		249	249			937	937
Upstream Blk Time (%)						0	0	1	0			
Queuing Penalty (veh)						0	2	3	0			
Storage Bay Dist (ft)	300		300	300		300			300	300		
Storage Blk Time (%)		0		0	0	0	0	1	0	0	8	8
Queuing Penalty (veh)		0		0	0	0	1	0	0	1	8	20

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	SB
Directions Served	R
Maximum Queue (ft)	300
Average Queue (ft)	177
95th Queue (ft)	384
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	1
Queuing Penalty (veh)	4

Intersection: 8: Site Driveway #4 & Tractor Supply Entrance

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	30	64
Average Queue (ft)	2	29
95th Queue (ft)	13	52
Link Distance (ft)	470	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site Driveway #5 & Turner Drive

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (ft)	563	52
Average Queue (ft)	105	0
95th Queue (ft)	512	0
Link Distance (ft)	1402	384
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)	6	
Queuing Penalty (veh)	0	

Intersection: 10: Tractor Supply Entrance & Site Driveway #6

Movement	SB
Directions Served	LR
Maximum Queue (ft)	38
Average Queue (ft)	15
95th Queue (ft)	41
Link Distance (ft)	938
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: Site Driveway #3 & Site Driveway #5

Movement	SB
Directions Served	LR
Maximum Queue (ft)	70
Average Queue (ft)	39
95th Queue (ft)	62
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Benns Church Boulevard & Site Driveway #7

Movement	WB	NB	NB	SB
Directions Served	R	T	T	T
Maximum Queue (ft)	57	30	35	3
Average Queue (ft)	16	2	2	0
95th Queue (ft)	39	18	21	3
Link Distance (ft)	245	554	554	249
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 337

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	297	180	309	255	753	764	149	844	849	245
Average Queue (ft)	132	86	144	241	534	536	57	511	526	121
95th Queue (ft)	233	177	297	296	910	923	132	810	824	292
Link Distance (ft)	656		676		798	798		1702	1702	
Upstream Blk Time (%)					5	6				
Queuing Penalty (veh)					47	53				
Storage Bay Dist (ft)		180		255			150			245
Storage Blk Time (%)	5	1		43	39		0	36	30	0
Queuing Penalty (veh)	7	1		329	110		2	22	44	3

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	R
Maximum Queue (ft)	113	212	220	250	181	100
Average Queue (ft)	42	84	87	36	37	9
95th Queue (ft)	93	337	344	191	186	78
Link Distance (ft)	470	472	472	798	798	
Upstream Blk Time (%)		0	0	0		
Queuing Penalty (veh)		2	3	0		
Storage Bay Dist (ft)						200
Storage Blk Time (%)					2	0
Queuing Penalty (veh)					2	1

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	EB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	L	T	T	R	L	T	T
Maximum Queue (ft)	358	298	222	144	325	372	336	334	109	130	780	785
Average Queue (ft)	210	177	87	75	316	349	128	140	5	30	550	568
95th Queue (ft)	361	291	188	133	363	403	265	283	53	90	901	909
Link Distance (ft)	384			457		349	349	349			780	780
Upstream Blk Time (%)	3					62	0	0			7	8
Queuing Penalty (veh)	16					375	1	1			59	65
Storage Bay Dist (ft)		305	305		325				200	140		
Storage Blk Time (%)	5	1	0		8	70		4	0	0	45	31
Queuing Penalty (veh)	18	1	0		15	130		1	0	0	13	79

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	SB
Directions Served	R
Maximum Queue (ft)	280
Average Queue (ft)	198
95th Queue (ft)	377
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	280
Storage Blk Time (%)	1
Queuing Penalty (veh)	7

Intersection: 4: Benns Church Boulevard & Red Oak Drive

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (ft)	385	170	1021	1038	9
Average Queue (ft)	173	27	241	252	0
95th Queue (ft)	439	98	943	966	5
Link Distance (ft)	950		1134	1134	
Upstream Blk Time (%)			9	12	
Queuing Penalty (veh)			0	0	
Storage Bay Dist (ft)		200			140
Storage Blk Time (%)		0	14		
Queuing Penalty (veh)		0	4		

Intersection: 5: Benns Church Boulevard & Site Driveway #1

Movement	EB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	R
Maximum Queue (ft)	237	50	51	352	353	159
Average Queue (ft)	75	7	8	122	130	32
95th Queue (ft)	216	58	58	437	450	152
Link Distance (ft)	377	780	780	472	472	
Upstream Blk Time (%)	3			1	2	
Queuing Penalty (veh)	0			11	16	
Storage Bay Dist (ft)						200
Storage Blk Time (%)					9	0
Queuing Penalty (veh)					8	2

Intersection: 6: Benns Church Boulevard & Site Driveway #2

Movement	EB	NB	NB	NB
Directions Served	R	T	T	T
Maximum Queue (ft)	95	960	979	970
Average Queue (ft)	31	631	553	453
95th Queue (ft)	67	1190	1216	1120
Link Distance (ft)	325	937	937	937
Upstream Blk Time (%)		10	4	1
Queuing Penalty (veh)		61	24	8
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	170	173	228	261	209	237	288	300	249	300	548	540
Average Queue (ft)	78	79	121	172	71	65	243	258	128	180	272	291
95th Queue (ft)	152	144	229	247	144	179	310	312	305	317	486	512
Link Distance (ft)		738			490		249	249			937	937
Upstream Blk Time (%)						0	16	24	1			
Queuing Penalty (veh)						0	140	209	0			
Storage Bay Dist (ft)	300		300	300		300			300	300		
Storage Blk Time (%)			0	0	0	0	16	24	1	0	4	6
Queuing Penalty (veh)			0	0	0	1	17	51	5	1	9	6

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	SB
Directions Served	R
Maximum Queue (ft)	300
Average Queue (ft)	76
95th Queue (ft)	264
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	0
Queuing Penalty (veh)	1

Intersection: 8: Site Driveway #4 & Tractor Supply Entrance

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	22	56
Average Queue (ft)	1	29
95th Queue (ft)	12	48
Link Distance (ft)	470	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site Driveway #5 & Turner Drive

Movement	EB
Directions Served	LT
Maximum Queue (ft)	144
Average Queue (ft)	20
95th Queue (ft)	121
Link Distance (ft)	1402
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	1
Queuing Penalty (veh)	0

Intersection: 10: Tractor Supply Entrance & Site Driveway #6

Movement	SB
Directions Served	LR
Maximum Queue (ft)	36
Average Queue (ft)	11
95th Queue (ft)	36
Link Distance (ft)	938
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: Site Driveway #3 & Site Driveway #5

Movement	SB
Directions Served	LR
Maximum Queue (ft)	73
Average Queue (ft)	39
95th Queue (ft)	62
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Benns Church Boulevard & Site Driveway #7

Movement	WB	NB	NB	NB
Directions Served	R	T	T	R
Maximum Queue (ft)	247	593	585	200
Average Queue (ft)	125	261	289	76
95th Queue (ft)	267	645	644	236
Link Distance (ft)	245	554	554	
Upstream Blk Time (%)	20	7	10	
Queuing Penalty (veh)	0	70	92	
Storage Bay Dist (ft)				200
Storage Blk Time (%)			26	1
Queuing Penalty (veh)			31	6

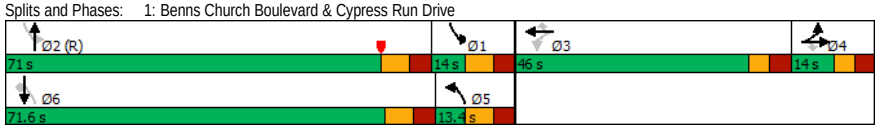
Network Summary

Network wide Queuing Penalty: 2183

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	0	93	105	0	84	85	1299	3	110	1537	45
Future Volume (vph)	65	0	93	105	0	84	85	1299	3	110	1537	45
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850						0.850
Flt Protected		0.950		0.950	0.950		0.950			0.950		
Satd. Flow (prot)	0	1492	1495	1143	1143	1615	1641	4848	0	1805	4988	1509
Flt Permitted		0.950		0.103	0.103		0.074			0.119		
Satd. Flow (perm)	0	1492	1495	124	124	1615	128	4848	0	226	4988	1509
Satd. Flow (RTOR)			157			155						145
Adj. Flow (vph)	68	0	97	109	0	88	89	1353	3	115	1601	47
Lane Group Flow (vph)	0	68	97	54	55	88	89	1356	0	115	1601	47
Turn Type	Split	NA	Perm	Perm	NA	Perm	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3		3	6			2		6
Total Split (s)	14.0	14.0	14.0	46.0	46.0	46.0	13.4	71.0		14.0	71.6	71.6
Total Lost Time (s)		6.8	6.8	7.1	7.1	7.1	8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		7.2	7.2	38.9	38.9	38.9	68.2	62.6		68.2	63.2	63.2
Actuated g/C Ratio		0.05	0.05	0.27	0.27	0.27	0.47	0.43		0.47	0.44	0.44
v/c Ratio		0.92	0.43	1.64	1.67	0.16	0.79	0.65		0.69	0.74	0.06
Control Delay		150.6	6.5	423.7	435.4	0.6	74.4	40.7		57.9	36.5	0.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		150.6	6.5	423.7	435.4	0.6	74.4	40.7		57.9	36.5	0.2
LOS		F	A	F	F	A	E	D		E	D	A
Approach Delay		65.9			238.0			42.8			37.0	
Approach LOS		E			F			D			D	

Intersection Summary			
Cycle Length: 145			
Actuated Cycle Length: 145			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.67			
Intersection Signal Delay: 51.7		Intersection LOS: D	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	0	93	105	0	84	85	1299	3	110	1537	45
Future Volume (vph)	65	0	93	105	0	84	85	1299	3	110	1537	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8	7.1	7.1	7.1	8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1492	1495	1143	1143	1615	1641	4847		1805	4988	1509
Flt Permitted		0.95	1.00	0.10	0.10	1.00	0.07	1.00		0.12	1.00	1.00
Satd. Flow (perm)		1492	1495	124	124	1615	128	4847		227	4988	1509
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	68	0	97	109	0	88	89	1353	3	115	1601	47
RTOR Reduction (vph)	0	0	92	0	0	64	0	0	0	0	0	27
Lane Group Flow (vph)	0	68	5	54	55	24	89	1356	0	115	1601	20
Heavy Vehicles (%)	21%	0%	8%	50%	0%	0%	10%	7%	0%	0%	4%	7%
Turn Type	Split	NA	Perm	Perm	NA	Perm	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3		3	6			2		6
Actuated Green, G (s)		7.2	7.2	38.9	38.9	38.9	68.2	62.6		68.2	63.2	63.2
Effective Green, g (s)		7.2	7.2	38.9	38.9	38.9	68.2	62.6		68.2	63.2	63.2
Actuated g/C Ratio		0.05	0.05	0.27	0.27	0.27	0.47	0.43		0.47	0.44	0.44
Clearance Time (s)		6.8	6.8	7.1	7.1	7.1	8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		74	74	33	33	433	112	2092		167	2174	657
v/s Ratio Prot		c0.05					c0.03	0.28		0.03	0.32	
v/s Ratio Perm			0.00	0.44	c0.44	0.01	c0.35			0.30		0.01
v/c Ratio		0.92	0.07	1.64	1.67	0.05	0.79	0.65		0.69	0.74	0.03
Uniform Delay, d1		68.6	65.7	53.0	53.0	39.4	52.7	32.5		48.2	34.0	23.4
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.80	1.20		1.00	1.00	1.00
Incremental Delay, d2		76.3	0.4	389.5	401.8	0.1	25.6	1.3		9.0	2.3	0.1
Delay (s)		144.9	66.1	442.5	454.9	39.4	68.0	40.4		57.2	36.3	23.5
Level of Service		F	E	F	F	D	E	D		E	D	C
Approach Delay (s)		98.6			265.9			42.1			37.3	
Approach LOS		F			F			D			D	

Intersection Summary					
HCM 2000 Control Delay		54.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio		1.09			
Actuated Cycle Length (s)		145.0	Sum of lost time (s)	30.7	
Intersection Capacity Utilization		64.3%	ICU Level of Service	C	
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	83	0	1387	1623	111
Future Volume (vph)	0	83	0	1387	1623	111
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	4848	4988	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	4848	4988	1583
Adj. Flow (vph)	0	90	0	1508	1764	121
Lane Group Flow (vph)	0	90	0	1508	1764	121
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	83	0	1387	1623	111
Future Volume (Veh/h)	0	83	0	1387	1623	111
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	90	0	1508	1764	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.74	0.74	0.74			
vC, conflicting volume	2267	588	1885			
vC1, stage 1 conf vol	1764					
vC2, stage 2 conf vol	503					
vCu, unblocked vol	1486	0	971			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	89	100			
cM capacity (veh/h)	212	803	523			

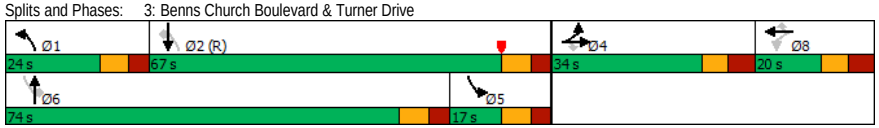
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	90	503	503	503	588	588	588	121
Volume Left	0	0	0	0	0	0	0	0
Volume Right	90	0	0	0	0	0	0	121
cSH	803	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.30	0.30	0.30	0.35	0.35	0.35	0.07
Queue Length 95th (ft)	9	0	0	0	0	0	0	0
Control Delay (s)	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	10.0	0.0			0.0			
Approach LOS	B							

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	43.2%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	439	40	311	19	8	3	424	902	80	5	1335	356
Future Volume (vph)	439	40	311	19	8	3	424	902	80	5	1335	356
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950	0.960		0.950	0.979		0.950			0.950		
Satd. Flow (prot)	1531	1575	1524	1715	1767	1615	3335	4940	1615	1805	5036	1538
Flt Permitted	0.950	0.960		0.741	0.726		0.080			0.236		
Satd. Flow (perm)	1531	1575	1524	1338	1310	1615	281	4940	1615	448	5036	1538
Satd. Flow (RTOR)			333			232			175			371
Adj. Flow (vph)	499	45	353	22	9	3	482	1025	91	6	1517	405
Lane Group Flow (vph)	269	275	353	15	16	3	482	1025	91	6	1517	405
Turn Type	Split	NA	Perm	Perm	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8		8	2		6	6		2
Total Split (s)	34.0	34.0	34.0	20.0	20.0	20.0	24.0	74.0	74.0	17.0	67.0	67.0
Total Lost Time (s)	9.0	9.0	9.0	9.0	9.0	9.0	8.3	8.3	8.3	8.3	8.3	8.3
Act Effct Green (s)	25.0	25.0	25.0	8.2	8.2	8.2	83.6	88.5	88.5	90.2	63.2	63.2
Actuated g/C Ratio	0.17	0.17	0.17	0.06	0.06	0.06	0.58	0.61	0.61	0.62	0.44	0.44
v/c Ratio	1.02	1.01	0.66	0.20	0.22	0.01	0.82	0.34	0.09	0.02	0.69	0.46
Control Delay	119.3	116.8	13.2	70.5	71.4	0.0	40.9	16.6	3.6	5.2	22.5	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.3	116.8	13.2	70.5	71.4	0.0	40.9	16.6	3.6	5.2	22.5	4.7
LOS	F	F	B	E	E	A	D	B	A	A	C	A
Approach Delay		76.8			64.7			23.2			18.7	
Approach LOS		E			E			C			B	

Intersection Summary			
Cycle Length: 145			
Actuated Cycle Length: 145			
Offset: 49 (34%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 32.4		Intersection LOS: C	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	439	40	311	19	8	3	424	902	80	5	1335	356
Future Volume (vph)	439	40	311	19	8	3	424	902	80	5	1335	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	9.0	9.0	9.0	9.0	9.0	9.0	8.3	8.3	8.3	8.3	8.3	8.3
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1531	1575	1524	1715	1766	1615	3335	4940	1615	1805	5036	1538
Flt Permitted	0.95	0.96	1.00	0.74	0.73	1.00	0.08	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	1531	1575	1524	1337	1311	1615	280	4940	1615	448	5036	1538
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	499	45	353	22	9	3	482	1025	91	6	1517	405
RTOR Reduction (vph)	0	0	276	0	0	3	0	0	42	0	0	218
Lane Group Flow (vph)	269	275	77	15	16	0	482	1025	49	6	1517	187
Heavy Vehicles (%)	12%	0%	6%	0%	0%	0%	5%	5%	0%	0%	3%	5%
Turn Type	Split	NA	Perm	Perm	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8		8	2		6	6		2
Actuated Green, G (s)	25.0	25.0	25.0	5.4	5.4	5.4	80.0	78.3	78.3	80.0	59.7	59.7
Effective Green, g (s)	25.0	25.0	25.0	5.4	5.4	5.4	80.0	78.3	78.3	80.0	59.7	59.7
Actuated g/C Ratio	0.17	0.17	0.17	0.04	0.04	0.04	0.55	0.54	0.54	0.55	0.41	0.41
Clearance Time (s)	9.0	9.0	9.0	9.0	9.0	9.0	8.3	8.3	8.3	8.3	8.3	8.3
Vehicle Extension (s)	5.0	5.0	5.0	3.0	3.0	3.0	4.0	6.0	6.0	2.0	6.0	6.0
Lane Grp Cap (vph)	263	271	262	49	48	60	582	2667	872	263	2073	633
v/s Ratio Prot	c0.18	0.17					c0.12	0.21		0.00	0.30	
v/s Ratio Perm			0.05	0.01	c0.01	0.00	c0.34		0.03	0.01		0.12
v/c Ratio	1.02	1.01	0.30	0.31	0.33	0.00	0.83	0.38	0.06	0.02	0.73	0.30
Uniform Delay, d1	60.0	60.0	52.3	68.0	68.0	67.2	39.2	19.4	15.8	19.3	35.9	28.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.77	1.02	1.00	0.38	0.62	0.84
Incremental Delay, d2	61.5	58.5	1.3	3.5	4.1	0.0	9.5	0.4	0.1	0.0	1.8	0.9
Delay (s)	121.5	118.5	53.6	71.5	72.1	67.2	39.7	20.1	15.9	7.3	24.1	24.9
Level of Service	F	F	D	E	E	E	D	C	B	A	C	C
Approach Delay (s)		93.9			71.4			25.8			24.2	
Approach LOS		F			E			C			C	

Intersection Summary					
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.85				
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	34.6		
Intersection Capacity Utilization	79.1%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	14	24	15	1547	1854	23
Future Volume (vph)	14	24	15	1547	1854	23
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.914					0.850
Flt Protected	0.982		0.950			
Satd. Flow (prot)	1695	0	1787	3406	3471	1599
Flt Permitted	0.982		0.950			
Satd. Flow (perm)	1695	0	1787	3406	3471	1599
Adj. Flow (vph)	15	26	16	1700	2037	25
Lane Group Flow (vph)	41	0	16	1700	2037	25
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 61.2%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	24	15	1547	1854	23
Future Volume (Veh/h)	14	24	15	1547	1854	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	15	26	16	1700	2037	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					932	
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	2919	1018	2062			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2901	570	1850			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	93	94			
cM capacity (veh/h)	10	381	268			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	41	16	850	850	1018	1018	25
Volume Left	15	16	0	0	0	0	0
Volume Right	26	0	0	0	0	0	25
cSH	26	268	1700	1700	1700	1700	1700
Volume to Capacity	1.59	0.06	0.50	0.50	0.60	0.60	0.01
Queue Length 95th (ft)	125	5	0	0	0	0	0
Control Delay (s)	619.0	19.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C					
Approach Delay (s)	619.0	0.2			0.0		
Approach LOS	F						

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	61.2%	ICU Level of Service		B
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	85	0	1386	1609	99
Future Volume (vph)	0	85	0	1386	1609	99
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	4848	4940	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	4848	4940	1583
Adj. Flow (vph)	0	89	0	1459	1694	104
Lane Group Flow (vph)	0	89	0	1459	1694	104
Sign Control	Stop			Free	Free	

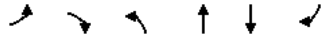
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	85	0	1386	1609	99
Future Volume (Veh/h)	0	85	0	1386	1609	99
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	89	0	1459	1694	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				844		
pX, platoon unblocked	0.89					
vC, conflicting volume	2180	565	1798			
vC1, stage 1 conf vol	1694					
vC2, stage 2 conf vol	486					
vCu, unblocked vol	1894	565	1798			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	81	100			
cM capacity (veh/h)	130	468	339			

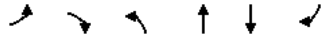
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	89	486	486	486	565	565	565	104
Volume Left	0	0	0	0	0	0	0	0
Volume Right	89	0	0	0	0	0	0	104
cSH	468	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.19	0.29	0.29	0.29	0.33	0.33	0.33	0.06
Queue Length 95th (ft)	17	0	0	0	0	0	0	0
Control Delay (s)	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	14.5	0.0			0.0			
Approach LOS	B							

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	43.0%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	76	0	1364	1605	73
Future Volume (vph)	0	76	0	1364	1605	73
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	4893	4988	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	4893	4988	1583
Adj. Flow (vph)	0	80	0	1436	1689	77
Lane Group Flow (vph)	0	80	0	1436	1689	77
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	76	0	1364	1605	73
Future Volume (Veh/h)	0	76	0	1364	1605	73
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	80	0	1436	1689	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				1022	428	
pX, platoon unblocked	0.81	0.75	0.75			
vC, conflicting volume	2168	563	1766			
vC1, stage 1 conf vol	1689					
vC2, stage 2 conf vol	479					
vCu, unblocked vol	714	0	870			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	90	100			
cM capacity (veh/h)	308	817	580			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	80	479	479	479	563	563	563	77
Volume Left	0	0	0	0	0	0	0	0
Volume Right	80	0	0	0	0	0	0	77
cSH	817	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.28	0.28	0.28	0.33	0.33	0.33	0.05
Queue Length 95th (ft)	8	0	0	0	0	0	0	0
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A							
Approach Delay (s)	9.9	0.0			0.0			
Approach LOS	A							

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	42.4%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	0	275	267	0	132	274	1194	92	94	1332	239
Future Volume (vph)	79	0	275	267	0	132	274	1194	92	94	1332	239
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	3433	1583	0	1770	4893	1583	1770	4988	1583
Flt Permitted	0.950			0.950			0.136			0.181		
Satd. Flow (perm)	1770	1583	0	3433	1583	0	253	4893	1583	337	4988	1583
Satd. Flow (RTOR)		247			211				97			252
Adj. Flow (vph)	83	0	289	281	0	139	288	1257	97	99	1402	252
Lane Group Flow (vph)	83	289	0	281	139	0	288	1257	97	99	1402	252
Turn Type	Prot	NA		Prot	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6		2	2		6
Total Split (s)	17.0	23.0		19.0	25.0		30.0	87.0	87.0	16.0	73.0	73.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	11.2	10.9		14.6	14.3		103.5	95.7	95.7	103.5	83.5	83.5
Actuated g/C Ratio	0.08	0.08		0.10	0.10		0.71	0.66	0.66	0.71	0.58	0.58
v/c Ratio	0.61	0.83		0.81	0.40		0.74	0.39	0.09	0.31	0.49	0.25
Control Delay	83.5	32.4		82.4	3.7		29.8	12.5	2.4	13.1	44.2	20.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	32.4		82.4	3.7		29.8	12.5	2.4	13.1	44.2	20.5
LOS	F	C		F	A		C	B	A	B	D	C
Approach Delay		43.8			56.3			14.9			39.1	
Approach LOS		D			E			B			D	

Intersection Summary			
Cycle Length: 145			
Actuated Cycle Length: 145			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 31.8		Intersection LOS: C	
Intersection Capacity Utilization 78.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: Benns Church Boulevard & Site Driveway #3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	0	275	267	0	132	274	1194	92	94	1332	239
Future Volume (vph)	79	0	275	267	0	132	274	1194	92	94	1332	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		3433	1583		1770	4893	1583	1770	4988	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.14	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1770	1583		3433	1583		253	4893	1583	338	4988	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	0	289	281	0	139	288	1257	97	99	1402	252
RTOR Reduction (vph)	0	228	0	0	125	0	0	0	33	0	0	107
Lane Group Flow (vph)	83	61	0	281	14	0	288	1257	64	99	1402	145
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	6%	2%	2%	4%	2%
Turn Type	Prot	NA		Prot	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6		2	2		6
Actuated Green, G (s)	11.2	10.9		14.6	14.3		103.5	95.7	95.7	103.5	83.5	83.5
Effective Green, g (s)	11.2	10.9		14.6	14.3		103.5	95.7	95.7	103.5	83.5	83.5
Actuated g/C Ratio	0.08	0.08		0.10	0.10		0.71	0.66	0.66	0.71	0.58	0.58
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	136	118		345	156		389	3229	1044	318	2872	911
v/s Ratio Prot	0.05	c0.04		c0.08	c0.01		c0.10	0.26		0.02	0.28	
v/s Ratio Perm							c0.43		0.04	0.21		0.09
v/c Ratio	0.61	0.51		0.81	0.09		0.74	0.39	0.06	0.31	0.49	0.16
Uniform Delay, d1	64.8	64.5		63.9	59.4		18.8	11.3	8.7	7.1	18.1	14.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.81	2.21	8.71
Incremental Delay, d2	7.9	3.7		13.7	0.2		7.4	0.4	0.1	0.4	0.5	0.3
Delay (s)	72.6	68.2		77.6	59.7		26.2	11.6	8.8	13.2	40.5	125.3
Level of Service	E	E		E	E		C	B	A	B	D	F
Approach Delay (s)		69.2			71.6			14.0			51.2	
Approach LOS		E			E			B			D	

Intersection Summary					
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	78.9%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

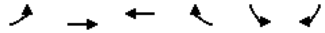
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	12	12	73	9	5	57
Future Volume (vph)	12	12	73	9	5	57
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.875	
Flt Protected				0.958	0.996	
Satd. Flow (prot)	1736	0	0	1785	1623	0
Flt Permitted				0.958	0.996	
Satd. Flow (perm)	1736	0	0	1785	1623	0
Adj. Flow (vph)	13	13	79	10	5	62
Lane Group Flow (vph)	26	0	0	89	67	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 21.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	12	12	73	9	5	57
Future Volume (Veh/h)	12	12	73	9	5	57
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	13	79	10	5	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			26		188	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			26		188	20
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		99	94
cM capacity (veh/h)			1588		762	1058

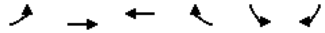
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	26	89	67
Volume Left	0	79	5
Volume Right	13	0	62
cSH	1700	1588	1029
Volume to Capacity	0.02	0.05	0.07
Queue Length 95th (ft)	0	4	5
Control Delay (s)	0.0	6.6	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	6.6	8.7
Approach LOS			A

Intersection Summary				
Average Delay		6.4		
Intersection Capacity Utilization		21.7%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	14	23	0
Future Volume (vph)	0	0	0	14	23	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	0
Adj. Flow (vph)	0	0	0	15	25	0
Lane Group Flow (vph)	0	0	15	0	25	0
Sign Control		Free	Free		Stop	

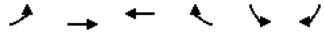
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	14	23	0
Future Volume (Veh/h)	0	0	0	14	23	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	15	25	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	15				8	8
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	15				8	8
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	1603				1013	1075

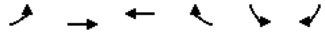
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	15	25
Volume Left	0	0	25
Volume Right	0	15	0
cSH	1700	1700	1013
Volume to Capacity	0.00	0.01	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

Intersection Summary				
Average Delay		5.4		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	158	316	0	106	0
Future Volume (vph)	0	158	316	0	106	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	0
Adj. Flow (vph)	0	172	343	0	115	0
Lane Group Flow (vph)	0	172	343	0	115	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 29.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	158	316	0	106	0
Future Volume (Veh/h)	0	158	316	0	106	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	172	343	0	115	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			837			
pX, platoon unblocked						
vC, conflicting volume	343				515	343
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343				515	343
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				78	100
cM capacity (veh/h)	1216				520	700

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	172	343	115
Volume Left	0	0	115
Volume Right	0	0	0
cSH	1216	1700	520
Volume to Capacity	0.00	0.20	0.22
Queue Length 95th (ft)	0	0	21
Control Delay (s)	0.0	0.0	13.9
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.9
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	33	1157	37	0	1547
Future Volume (vph)	0	33	1157	37	0	1547
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	5085	1583	0	5085
Flt Permitted						
Satd. Flow (perm)	0	1611	5085	1583	0	5085
Adj. Flow (vph)	0	36	1258	40	0	1682
Lane Group Flow (vph)	0	36	1258	40	0	1682
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	33	1157	37	0	1547
Future Volume (Veh/h)	0	33	1157	37	0	1547
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	36	1258	40	0	1682
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						315
pX, platoon unblocked	0.84					
vC, conflicting volume	1819	419			1298	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1317	419			1298	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			100	
cM capacity (veh/h)	126	583			530	

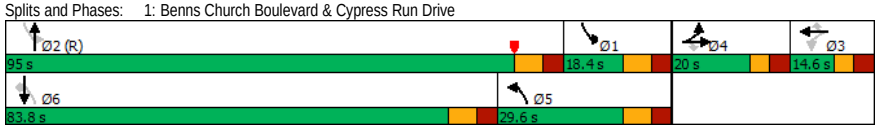
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	36	419	419	419	40	561	561	561
Volume Left	0	0	0	0	0	0	0	0
Volume Right	36	0	0	0	40	0	0	0
cSH	583	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.25	0.25	0.25	0.02	0.33	0.33	0.33
Queue Length 95th (ft)	5	0	0	0	0	0	0	0
Control Delay (s)	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	11.6	0.0				0.0		
Approach LOS	B							

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	33.2%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	0	149	99	5	152	317	1793	0	122	1764	168
Future Volume (vph)	154	0	149	99	5	152	317	1793	0	122	1764	168
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850						0.850
Flt Protected		0.950		0.950	0.957		0.950			0.950		
Satd. Flow (prot)	0	1805	1615	1715	1727	1615	1805	5085	0	1805	4988	1553
Flt Permitted		0.950		0.657	0.639		0.065			0.077		
Satd. Flow (perm)	0	1805	1615	1186	1153	1615	124	5085	0	146	4988	1553
Satd. Flow (RTOR)			216			214						204
Adj. Flow (vph)	157	0	152	101	5	155	323	1830	0	124	1800	171
Lane Group Flow (vph)	0	157	152	53	53	155	323	1830	0	124	1800	171
Turn Type	Split	NA	Perm	Perm	NA	Perm	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3		3	6			2		6
Total Split (s)	20.0	20.0	20.0	14.6	14.6	14.6	29.6	95.0		18.4	83.8	83.8
Total Lost Time (s)		6.8	6.8	7.1	7.1	7.1	8.4	8.4		8.4	8.4	8.4
Act Effct Green (s)		13.2	13.2	7.5	7.5	7.5	96.6	86.6		96.6	75.4	75.4
Actuated g/C Ratio		0.09	0.09	0.05	0.05	0.05	0.65	0.59		0.65	0.51	0.51
v/c Ratio		0.98	0.45	0.88	0.91	0.55	1.01	0.62		0.60	0.71	0.19
Control Delay		132.2	5.3	153.9	163.0	9.1	83.9	31.2		44.3	29.8	1.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		132.2	5.3	153.9	163.0	9.1	83.9	31.2		44.3	29.8	1.6
LOS		F	A	F	F	A	F	C		D	C	A
Approach Delay		69.8			69.8			39.1			28.4	
Approach LOS		E			E			D			C	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 38.1		Intersection LOS: D	
Intersection Capacity Utilization 86.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Benns Church Boulevard & Cypress Run Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	0	149	99	5	152	317	1793	0	122	1764	168
Future Volume (vph)	154	0	149	99	5	152	317	1793	0	122	1764	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8	6.8	7.1	7.1	7.1	8.4	8.4		8.4	8.4	8.4
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1805	1615	1715	1727	1615	1805	5085		1805	4988	1553
Flt Permitted		0.95	1.00	0.66	0.64	1.00	0.07	1.00		0.08	1.00	1.00
Satd. Flow (perm)		1805	1615	1187	1153	1615	124	5085		146	4988	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	157	0	152	101	5	155	323	1830	0	124	1800	171
RTOR Reduction (vph)	0	0	138	0	0	147	0	0	0	0	0	84
Lane Group Flow (vph)	0	157	14	53	53	8	323	1830	0	124	1800	87
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	4%
Turn Type	Split	NA	Perm	Perm	NA	Perm	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			3		5	2		1	6	
Permitted Phases			4	3		3	6			2		6
Actuated Green, G (s)		13.2	13.2	7.5	7.5	7.5	96.6	86.6		96.6	75.4	75.4
Effective Green, g (s)		13.2	13.2	7.5	7.5	7.5	96.6	86.6		96.6	75.4	75.4
Actuated g/C Ratio		0.09	0.09	0.05	0.05	0.05	0.65	0.59		0.65	0.51	0.51
Clearance Time (s)		6.8	6.8	7.1	7.1	7.1	8.4	8.4		8.4	8.4	8.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)		160	144	60	58	81	321	2975		207	2541	791
v/s Ratio Prot		c0.09					c0.14	0.36		0.04	0.36	
v/s Ratio Perm			0.01	0.04	c0.05	0.00	c0.51			0.35		0.06
v/c Ratio		0.98	0.09	0.88	0.91	0.10	1.01	0.62		0.60	0.71	0.11
Uniform Delay, d1		67.3	61.9	69.8	69.9	67.0	43.5	19.9		37.6	27.9	18.9
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.74	1.52		1.00	1.00	1.00
Incremental Delay, d2		65.3	0.3	75.4	86.9	0.5	44.6	0.7		3.1	1.7	0.3
Delay (s)		132.5	62.2	145.2	156.8	67.5	76.8	31.0		40.6	29.6	19.1
Level of Service		F	E	F	F	E	E	C		D	C	B
Approach Delay (s)		97.9			101.4			37.9			29.4	
Approach LOS		F			F			D			C	

Intersection Summary					
HCM 2000 Control Delay		41.5	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio		0.99			
Actuated Cycle Length (s)		148.0	Sum of lost time (s)		30.7
Intersection Capacity Utilization		86.5%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	73	0	2111	1905	108
Future Volume (vph)	0	73	0	2111	1905	108
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	5085	4988	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	5085	4988	1583
Adj. Flow (vph)	0	79	0	2295	2071	117
Lane Group Flow (vph)	0	79	0	2295	2071	117
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	73	0	2111	1905	108
Future Volume (Veh/h)	0	73	0	2111	1905	108
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	79	0	2295	2071	117
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					870	
pX, platoon unblocked	0.73	0.73	0.73			
vC, conflicting volume	2836	690	2188			
vC1, stage 1 conf vol	2071					
vC2, stage 2 conf vol	765					
vCu, unblocked vol	2212	0	1321			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	90	100			
cM capacity (veh/h)	130	789	377			

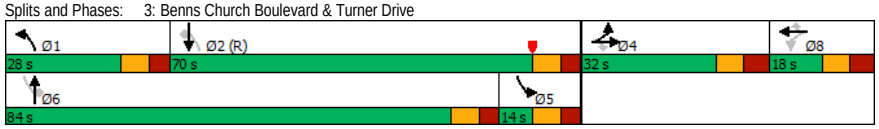
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	79	765	765	765	690	690	690	117
Volume Left	0	0	0	0	0	0	0	0
Volume Right	79	0	0	0	0	0	0	117
cSH	789	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.45	0.45	0.45	0.41	0.41	0.41	0.07
Queue Length 95th (ft)	8	0	0	0	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	10.1	0.0			0.0			
Approach LOS	B							

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	48.0%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	379	17	189	90	43	10	410	1736	33	35	1637	296
Future Volume (vph)	379	17	189	90	43	10	410	1736	33	35	1637	296
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950	0.956		0.950	0.982		0.950			0.950		
Satd. Flow (prot)	1698	1710	1599	1715	1773	1615	3335	5085	1615	1805	5085	1615
Flt Permitted	0.950	0.956		0.620	0.784		0.064			0.064		
Satd. Flow (perm)	1698	1710	1599	1119	1415	1615	225	5085	1615	122	5085	1615
Satd. Flow (RTOR)			228			228			172			252
Adj. Flow (vph)	399	18	199	95	45	11	432	1827	35	37	1723	312
Lane Group Flow (vph)	207	210	199	68	72	11	432	1827	35	37	1723	312
Turn Type	Split	NA	Perm	Perm	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8		8	2		6	6		2
Total Split (s)	32.0	32.0	32.0	18.0	18.0	18.0	28.0	84.0	84.0	14.0	70.0	70.0
Total Lost Time (s)	9.0	9.0	9.0	9.0	9.0	9.0	8.3	8.3	8.3	8.3	8.3	8.3
Act Effct Green (s)	22.0	22.0	22.0	10.0	10.0	10.0	81.4	78.5	78.5	83.1	62.7	62.7
Actuated g/C Ratio	0.15	0.15	0.15	0.07	0.07	0.07	0.55	0.53	0.53	0.56	0.42	0.42
v/c Ratio	0.82	0.83	0.46	0.91	0.76	0.03	0.84	0.68	0.04	0.28	0.80	0.38
Control Delay	86.1	86.6	7.3	145.7	109.7	0.2	49.0	13.3	0.1	16.2	31.0	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.1	86.6	7.3	145.7	109.7	0.2	49.0	13.3	0.1	16.2	31.0	7.5
LOS	F	F	A	F	F	A	D	B	A	B	C	A
Approach Delay		60.8			117.9			19.9			27.2	
Approach LOS		E			F			B			C	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 38 (26%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 30.6		Intersection LOS: C	
Intersection Capacity Utilization 82.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	379	17	189	90	43	10	410	1736	33	35	1637	296
Future Volume (vph)	379	17	189	90	43	10	410	1736	33	35	1637	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	9.0	9.0	9.0	9.0	9.0	9.0	8.3	8.3	8.3	8.3	8.3	8.3
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1698	1710	1599	1715	1772	1615	3335	5085	1615	1805	5085	1615
Flt Permitted	0.95	0.96	1.00	0.62	0.78	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1698	1710	1599	1119	1415	1615	224	5085	1615	121	5085	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	399	18	199	95	45	11	432	1827	35	37	1723	312
RTOR Reduction (vph)	0	0	169	0	0	10	0	0	17	0	0	145
Lane Group Flow (vph)	207	210	30	68	72	1	432	1827	18	37	1723	167
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	5%	2%	0%	0%	2%	0%
Turn Type	Split	NA	Perm	Perm	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8		8	2		6	6		2
Actuated Green, G (s)	22.0	22.0	22.0	10.0	10.0	10.0	81.4	76.8	76.8	81.4	62.7	62.7
Effective Green, g (s)	22.0	22.0	22.0	10.0	10.0	10.0	81.4	76.8	76.8	81.4	62.7	62.7
Actuated g/C Ratio	0.15	0.15	0.15	0.07	0.07	0.07	0.55	0.52	0.52	0.55	0.42	0.42
Clearance Time (s)	9.0	9.0	9.0	9.0	9.0	9.0	8.3	8.3	8.3	8.3	8.3	8.3
Vehicle Extension (s)	5.0	5.0	5.0	3.0	3.0	3.0	4.0	6.0	6.0	2.0	6.0	6.0
Lane Grp Cap (vph)	252	254	237	75	95	109	516	2638	838	118	2154	684
v/s Ratio Prot	0.12	c0.12					0.11	c0.36		0.01	0.34	
v/s Ratio Perm			0.02	c0.06	0.05	0.00	c0.35		0.01	0.16		0.10
v/c Ratio	0.82	0.83	0.12	0.91	0.76	0.01	0.84	0.69	0.02	0.31	0.80	0.24
Uniform Delay, d1	61.1	61.2	54.6	68.5	67.8	64.4	43.8	26.7	17.3	41.1	37.2	27.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.47	1.00	0.52	0.75	1.03
Incremental Delay, d2	21.0	21.3	0.5	72.1	28.6	0.0	9.1	1.1	0.0	0.4	2.6	0.7
Delay (s)	82.0	82.5	55.1	140.6	96.5	64.4	48.7	13.6	17.4	21.9	30.6	29.0
Level of Service	F	F	E	F	F	E	D	B	B	C	C	C
Approach Delay (s)		73.5			114.0			20.3			30.2	
Approach LOS		E			F			C			C	

Intersection Summary					
HCM 2000 Control Delay		33.5	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.85			
Actuated Cycle Length (s)		148.0	Sum of lost time (s)		34.6
Intersection Capacity Utilization		82.3%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	19	35	2246	1981	26
Future Volume (vph)	11	19	35	2246	1981	26
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.913					0.850
Flt Protected	0.983		0.950			
Satd. Flow (prot)	1705	0	1736	3539	3505	1615
Flt Permitted	0.983		0.950			
Satd. Flow (perm)	1705	0	1736	3539	3505	1615
Adj. Flow (vph)	11	20	36	2340	2064	27
Lane Group Flow (vph)	31	0	36	2340	2064	27
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 72.1%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	19	35	2246	1981	26
Future Volume (Veh/h)	11	19	35	2246	1981	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	11	20	36	2340	2064	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					932	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	3306	1032	2091			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3380	556	1871			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	95	86			
cM capacity (veh/h)	4	386	249			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	31	36	1170	1170	1032	1032	27
Volume Left	11	36	0	0	0	0	0
Volume Right	20	0	0	0	0	0	27
cSH	11	249	1700	1700	1700	1700	1700
Volume to Capacity	2.75	0.14	0.69	0.69	0.61	0.61	0.02
Queue Length 95th (ft)	121	12	0	0	0	0	0
Control Delay (s)	1457.5	21.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C					
Approach Delay (s)	1457.5	0.3			0.0		
Approach LOS	F						

Intersection Summary				
Average Delay		10.2		
Intersection Capacity Utilization		72.1%	ICU Level of Service	C
Analysis Period (min)		15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	67	0	2105	1898	85
Future Volume (vph)	0	67	0	2105	1898	85
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	5085	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	5085	5085	1583
Adj. Flow (vph)	0	71	0	2216	1998	89
Lane Group Flow (vph)	0	71	0	2216	1998	89
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 47.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	67	0	2105	1898	85
Future Volume (Veh/h)	0	67	0	2105	1898	85
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	71	0	2216	1998	89
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				844		
pX, platoon unblocked	0.73					
vC, conflicting volume	2737	666	2087			
vC1, stage 1 conf vol	1998					
vC2, stage 2 conf vol	739					
vCu, unblocked vol	2077	666	2087			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	82	100			
cM capacity (veh/h)	89	402	262			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	71	739	739	739	666	666	666	89
Volume Left	0	0	0	0	0	0	0	0
Volume Right	71	0	0	0	0	0	0	89
cSH	402	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.43	0.43	0.43	0.39	0.39	0.39	0.05
Queue Length 95th (ft)	16	0	0	0	0	0	0	0
Control Delay (s)	15.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C							
Approach Delay (s)	15.9	0.0			0.0			
Approach LOS	C							

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		47.5%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	58	0	2142	1876	49
Future Volume (vph)	0	58	0	2142	1876	49
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1611	0	5085	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	1611	0	5085	5085	1583
Adj. Flow (vph)	0	61	0	2255	1975	52
Lane Group Flow (vph)	0	61	0	2255	1975	52
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	58	0	2142	1876	49
Future Volume (Veh/h)	0	58	0	2142	1876	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	61	0	2255	1975	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				2	2	
Upstream signal (ft)				1022	428	
pX, platoon unblocked	0.85	0.70	0.70			
vC, conflicting volume	2727	658	2027			
vC1, stage 1 conf vol	1975					
vC2, stage 2 conf vol	752					
vCu, unblocked vol	144	0	992			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	100			
cM capacity (veh/h)	715	764	488			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	61	752	752	752	658	658	658	52
Volume Left	0	0	0	0	0	0	0	0
Volume Right	61	0	0	0	0	0	0	52
cSH	764	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.08	0.44	0.44	0.44	0.39	0.39	0.39	0.03
Queue Length 95th (ft)	6	0	0	0	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	10.1	0.0			0.0			
Approach LOS	B							

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	46.5%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	0	187	227	0	145	106	1943	208	231	1591	101
Future Volume (vph)	92	0	187	227	0	145	106	1943	208	231	1591	101
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	3433	1583	0	1770	5085	1583	1770	5085	1583
Flt Permitted	0.950			0.950			0.105			0.049		
Satd. Flow (perm)	1770	1583	0	3433	1583	0	196	5085	1583	91	5085	1583
Satd. Flow (RTOR)		133			165				217			106
Adj. Flow (vph)	97	0	197	239	0	153	112	2045	219	243	1675	106
Lane Group Flow (vph)	97	197	0	239	153	0	112	2045	219	243	1675	106
Turn Type	Prot	NA		Prot	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6		2	2		6
Total Split (s)	19.0	20.0		19.0	20.0		15.0	89.0	89.0	20.0	94.0	94.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	12.6	11.4		14.1	12.9		106.5	86.8	86.8	106.5	98.2	98.2
Actuated g/C Ratio	0.09	0.08		0.10	0.09		0.72	0.59	0.59	0.72	0.66	0.66
v/c Ratio	0.65	0.81		0.74	0.53		0.49	0.69	0.22	0.84	0.50	0.10
Control Delay	84.6	46.9		78.9	13.7		13.4	23.0	2.3	43.7	39.8	16.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.6	46.9		78.9	13.7		13.4	23.0	2.3	43.7	39.8	16.3
LOS	F	D		E	B		B	C	A	D	D	B
Approach Delay		59.3			53.5			20.6			39.1	
Approach LOS		E			D			C			D	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 32.7		Intersection LOS: C	
Intersection Capacity Utilization 81.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: Benns Church Boulevard & Site Driveway #3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	0	187	227	0	145	106	1943	208	231	1591	101
Future Volume (vph)	92	0	187	227	0	145	106	1943	208	231	1591	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		3433	1583		1770	5085	1583	1770	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.10	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1770	1583		3433	1583		195	5085	1583	91	5085	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	0	197	239	0	153	112	2045	219	243	1675	106
RTOR Reduction (vph)	0	123	0	0	140	0	0	0	90	0	0	36
Lane Group Flow (vph)	97	74	0	239	13	0	112	2045	129	243	1675	70
Turn Type	Prot	NA		Prot	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6		2	2		6
Actuated Green, G (s)	12.6	11.4		14.1	12.9		106.5	86.8	86.8	106.5	98.2	98.2
Effective Green, g (s)	12.6	11.4		14.1	12.9		106.5	86.8	86.8	106.5	98.2	98.2
Actuated g/C Ratio	0.09	0.08		0.10	0.09		0.72	0.59	0.59	0.72	0.66	0.66
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	121		327	137		228	2982	928	288	3373	1050
v/s Ratio Prot	0.05	c0.05		c0.07	0.01		0.03	0.40		c0.11	0.33	
v/s Ratio Perm							0.32		0.08	c0.49		0.04
v/c Ratio	0.65	0.61		0.73	0.10		0.49	0.69	0.14	0.84	0.50	0.07
Uniform Delay, d1	65.5	66.2		65.1	62.2		9.1	21.2	13.8	46.2	12.5	8.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.54	2.96	8.08
Incremental Delay, d2	9.2	8.9		8.2	0.3		1.7	1.3	0.3	13.7	0.3	0.1
Delay (s)	74.8	75.1		73.3	62.5		10.8	22.5	14.1	38.8	37.3	71.0
Level of Service	E	E		E	E		B	C	B	D	D	E
Approach Delay (s)		75.0			69.1			21.1			39.2	
Approach LOS		E			E			C			D	

Intersection Summary					
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.81				
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	81.7%	ICU Level of Service	D		
Analysis Period (min)	15				

c Critical Lane Group

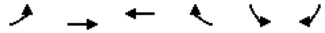
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	8	8	67	26	13	49
Future Volume (vph)	8	8	67	26	13	49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.893	
Flt Protected				0.965	0.990	
Satd. Flow (prot)	1736	0	0	1798	1647	0
Flt Permitted				0.965	0.990	
Satd. Flow (perm)	1736	0	0	1798	1647	0
Adj. Flow (vph)	9	9	73	28	14	53
Lane Group Flow (vph)	18	0	0	101	67	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 22.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	8	8	67	26	13	49
Future Volume (Veh/h)	8	8	67	26	13	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	9	73	28	14	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			18		188	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			18		188	14
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		98	95
cM capacity (veh/h)			1599		765	1067

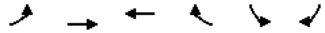
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	18	101	67
Volume Left	0	73	14
Volume Right	9	0	53
cSH	1700	1599	985
Volume to Capacity	0.01	0.05	0.07
Queue Length 95th (ft)	0	4	5
Control Delay (s)	0.0	5.4	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	5.4	8.9
Approach LOS			A

Intersection Summary				
Average Delay		6.2		
Intersection Capacity Utilization		22.2%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	39	16	0
Future Volume (vph)	0	0	0	39	16	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	0
Adj. Flow (vph)	0	0	0	42	17	0
Lane Group Flow (vph)	0	0	42	0	17	0
Sign Control		Free	Free		Stop	

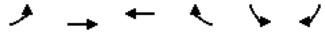
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	39	16	0
Future Volume (Veh/h)	0	0	0	39	16	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	42	17	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	42				21	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42				21	21
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	1567				996	1056

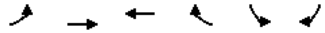
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	42	17
Volume Left	0	0	17
Volume Right	0	42	0
cSH	1700	1700	996
Volume to Capacity	0.00	0.02	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	142	0
Future Volume (vph)	0	0	0	0	142	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	0
Adj. Flow (vph)	0	0	0	0	154	0
Lane Group Flow (vph)	0	0	0	0	154	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 11.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	142	0
Future Volume (Veh/h)	0	0	0	0	142	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	154	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			837			
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	154
Volume Left	0	0	154
Volume Right	0	0	0
cSH	1700	1700	1023
Volume to Capacity	0.00	0.20	0.15
Queue Length 95th (ft)	0	0	13
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

Intersection Summary				
Average Delay		9.1		
Intersection Capacity Utilization		11.2%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	39	1924	116	0	1698
Future Volume (vph)	0	39	1924	116	0	1698
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	5085	1583	0	5085
Flt Permitted						
Satd. Flow (perm)	0	1611	5085	1583	0	5085
Adj. Flow (vph)	0	42	2091	126	0	1846
Lane Group Flow (vph)	0	42	2091	126	0	1846
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 47.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	39	1924	116	0	1698
Future Volume (Veh/h)	0	39	1924	116	0	1698
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	42	2091	126	0	1846
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						315
pX, platoon unblocked	0.84					
vC, conflicting volume	2706	697			2217	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2365	697			2217	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	89			100	
cM capacity (veh/h)	25	383			232	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	42	697	697	697	126	615	615	615
Volume Left	0	0	0	0	0	0	0	0
Volume Right	42	0	0	0	126	0	0	0
cSH	383	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.41	0.41	0.41	0.07	0.36	0.36	0.36
Queue Length 95th (ft)	9	0	0	0	0	0	0	0
Control Delay (s)	15.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C							
Approach Delay (s)	15.5	0.0				0.0		
Approach LOS	C							

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		47.2%	ICU Level of Service	A
Analysis Period (min)		15		

MOVEMENT SUMMARY

Site: 101 [Turner Drive at Site Driveway #9 2045 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Site Driveway #5														
3	L2	42	2.0	46	2.0	0.381	11.7	LOS B	1.9	47.3	0.72	0.78	0.90	31.4
8	T1	21	2.0	23	2.0	0.381	11.7	LOS B	1.9	47.3	0.72	0.78	0.90	31.3
18	R2	144	2.0	157	2.0	0.381	11.7	LOS B	1.9	47.3	0.72	0.78	0.90	30.5
Approach		207	2.0	225	2.0	0.381	11.7	LOS B	1.9	47.3	0.72	0.78	0.90	30.8
East: Turner Drive														
1	L2	158	2.0	172	2.0	0.676	12.3	LOS B	6.8	172.3	0.55	0.32	0.55	23.0
6	T1	546	2.0	593	2.0	0.676	12.3	LOS B	6.8	172.3	0.55	0.32	0.55	22.6
16	R2	53	2.0	58	2.0	0.676	12.3	LOS B	6.8	172.3	0.55	0.32	0.55	22.1
Approach		757	2.0	823	2.0	0.676	12.3	LOS B	6.8	172.3	0.55	0.32	0.55	22.6
North: Site Driveway #5														
7	L2	83	2.0	90	2.0	0.235	9.3	LOS A	0.9	24.0	0.67	0.67	0.67	31.4
4	T1	10	2.0	11	2.0	0.235	9.3	LOS A	0.9	24.0	0.67	0.67	0.67	31.4
14	R2	33	2.0	36	2.0	0.235	9.3	LOS A	0.9	24.0	0.67	0.67	0.67	30.6
Approach		126	2.0	137	2.0	0.235	9.3	LOS A	0.9	24.0	0.67	0.67	0.67	31.2
West: Turner Drive														
5	L2	30	2.0	33	2.0	0.782	18.8	LOS C	17.1	434.3	0.90	1.30	1.68	21.7
2	T1	619	2.0	673	2.0	0.782	18.8	LOS C	17.1	434.3	0.90	1.30	1.68	21.3
12	R2	84	2.0	91	2.0	0.782	18.8	LOS C	17.1	434.3	0.90	1.30	1.68	20.9
Approach		733	2.0	797	2.0	0.782	18.8	LOS C	17.1	434.3	0.90	1.30	1.68	21.3
All Vehicles		1823	2.0	1982	2.0	0.782	14.6	LOS B	17.1	434.3	0.72	0.79	1.05	23.2

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.

MOVEMENT SUMMARY

Site: 101 [Turner Drive at Site Driveway #9 2045 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Site Driveway #5														
3	L2	38	2.0	41	2.0	0.241	7.5	LOS A	1.0	26.5	0.61	0.59	0.61	33.3
8	T1	19	2.0	21	2.0	0.241	7.5	LOS A	1.0	26.5	0.61	0.59	0.61	33.2
18	R2	110	2.0	120	2.0	0.241	7.5	LOS A	1.0	26.5	0.61	0.59	0.61	32.3
Approach		167	2.0	182	2.0	0.241	7.5	LOS A	1.0	26.5	0.61	0.59	0.61	32.6
East: Turner Drive														
1	L2	104	2.0	113	2.0	0.647	11.5	LOS B	6.0	153.0	0.54	0.32	0.54	23.2
6	T1	550	2.0	598	2.0	0.647	11.5	LOS B	6.0	153.0	0.54	0.32	0.54	22.8
16	R2	64	2.0	70	2.0	0.647	11.5	LOS B	6.0	153.0	0.54	0.32	0.54	22.3
Approach		718	2.0	780	2.0	0.647	11.5	LOS B	6.0	153.0	0.54	0.32	0.54	22.8
North: Site Driveway #5														
7	L2	106	2.0	115	2.0	0.260	9.2	LOS A	1.1	27.3	0.67	0.67	0.67	31.4
4	T1	11	2.0	12	2.0	0.260	9.2	LOS A	1.1	27.3	0.67	0.67	0.67	31.3
14	R2	31	2.0	34	2.0	0.260	9.2	LOS A	1.1	27.3	0.67	0.67	0.67	30.5
Approach		148	2.0	161	2.0	0.260	9.2	LOS A	1.1	27.3	0.67	0.67	0.67	31.2
West: Turner Drive														
5	L2	44	2.0	48	2.0	0.529	9.8	LOS A	3.5	89.4	0.60	0.47	0.60	23.7
2	T1	368	2.0	400	2.0	0.529	9.8	LOS A	3.5	89.4	0.60	0.47	0.60	23.2
12	R2	101	2.0	110	2.0	0.529	9.8	LOS A	3.5	89.4	0.60	0.47	0.60	22.7
Approach		513	2.0	558	2.0	0.529	9.8	LOS A	3.5	89.4	0.60	0.47	0.60	23.2
All Vehicles		1546	2.0	1680	2.0	0.647	10.3	LOS B	6.0	153.0	0.58	0.43	0.58	24.4

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.

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	TR	L	T	T
Maximum Queue (ft)	202	168	198	190	124	218	326	353	296	149	296	311
Average Queue (ft)	64	43	86	62	28	73	169	198	145	77	158	163
95th Queue (ft)	143	101	167	148	74	164	283	312	258	149	271	276
Link Distance (ft)	646		664	664			789	789	789		834	834
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		180			150	255				150		
Storage Blk Time (%)	0	0		1	0	0	2			1	7	
Queuing Penalty (veh)	0	0		1	0	0	2			3	7	

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	383	206
Average Queue (ft)	200	28
95th Queue (ft)	328	127
Link Distance (ft)	834	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		245
Storage Blk Time (%)	4	0
Queuing Penalty (veh)	2	0

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB
Directions Served	R
Maximum Queue (ft)	91
Average Queue (ft)	35
95th Queue (ft)	72
Link Distance (ft)	458
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	NB
Directions Served	L	LT	R	L	LT	R	L	L	T	T	T	R
Maximum Queue (ft)	392	305	296	59	46	18	321	325	428	260	209	138
Average Queue (ft)	316	263	171	16	9	2	281	292	319	120	106	18
95th Queue (ft)	450	363	326	45	30	12	386	391	540	230	190	75
Link Distance (ft)	372			446	446				349	349	349	
Upstream Blk Time (%)	20								50	0		
Queuing Penalty (veh)	161								229	0		
Storage Bay Dist (ft)		305	305			150	325	325				200
Storage Blk Time (%)	23	5	1				4	41	36		0	0
Queuing Penalty (veh)	137	10	1				11	123	154		0	0

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (ft)	68	376	401	455	280
Average Queue (ft)	5	232	249	233	123
95th Queue (ft)	34	342	358	372	275
Link Distance (ft)		768	768	768	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	140				280
Storage Blk Time (%)	0	17		2	0
Queuing Penalty (veh)	0	1		7	1

Intersection: 4: Benns Church Boulevard & Red Oak Drive

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	LR	L	T	T	T	T	R
Maximum Queue (ft)	225	76	203	174	39	64	28
Average Queue (ft)	109	13	38	33	1	2	0
95th Queue (ft)	340	53	264	243	40	47	2
Link Distance (ft)	950		1134	1134	553	553	553
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200					
Storage Blk Time (%)		0	5				
Queuing Penalty (veh)		0	1				

Intersection: 5: Benns Church Boulevard & Site Driveway #1

Movement	EB
Directions Served	R
Maximum Queue (ft)	98
Average Queue (ft)	38
95th Queue (ft)	75
Link Distance (ft)	365
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Benns Church Boulevard & Site Driveway #2

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	T
Maximum Queue (ft)	81	816	776	413	5	77	60
Average Queue (ft)	31	463	267	32	0	2	1
95th Queue (ft)	62	1128	841	276	5	35	26
Link Distance (ft)	312	933	933	933	349	349	349
Upstream Blk Time (%)		14	0			0	
Queuing Penalty (veh)		65	1			0	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	T	T	R	L	T
Maximum Queue (ft)	162	196	248	276	179	234	276	250	214	54	280	453
Average Queue (ft)	69	80	142	186	58	140	175	121	66	13	72	213
95th Queue (ft)	135	152	244	264	137	248	297	252	170	41	203	408
Link Distance (ft)		726			479		250	250	250			933
Upstream Blk Time (%)						0	11	1	0			
Queuing Penalty (veh)						0	44	3	0			
Storage Bay Dist (ft)	300		300	300		300				300	300	
Storage Blk Time (%)			0	0	0	0	11		0		0	3
Queuing Penalty (veh)			0	1	0	1	30		0		0	3

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	482	398	274
Average Queue (ft)	234	167	62
95th Queue (ft)	433	363	164
Link Distance (ft)	933	933	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			300
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		1	0

Intersection: 8: Site Driveway #4 & Tractor Supply Entrance

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	59
Average Queue (ft)	3	30
95th Queue (ft)	16	52
Link Distance (ft)	458	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site Driveway #5 & Turner Drive

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (ft)	1092	57
Average Queue (ft)	360	2
95th Queue (ft)	1164	58
Link Distance (ft)	1402	372
Upstream Blk Time (%)	6	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)	21	
Queuing Penalty (veh)	0	

Intersection: 10: Tractor Supply Entrance & Site Driveway #6

Movement	SB
Directions Served	LR
Maximum Queue (ft)	49
Average Queue (ft)	16
95th Queue (ft)	43
Link Distance (ft)	938
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: Site Driveway #3 & Site Driveway #5

Movement	SB
Directions Served	LR
Maximum Queue (ft)	82
Average Queue (ft)	41
95th Queue (ft)	67
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Benns Church Boulevard & Site Driveway #12

Movement	WB	NB	NB	NB	SB	SB
Directions Served	R	T	T	T	T	T
Maximum Queue (ft)	73	300	271	160	67	48
Average Queue (ft)	21	79	54	9	2	2
95th Queue (ft)	60	355	286	95	41	35
Link Distance (ft)	233	553	553	553	250	250
Upstream Blk Time (%)		4	0	0	0	0
Queuing Penalty (veh)		22	1	0	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)				0		
Queuing Penalty (veh)				0		

Intersection: 28: Bend

Movement	NB	NB
Directions Served	T	T
Maximum Queue (ft)	287	248
Average Queue (ft)	13	14
95th Queue (ft)	178	183
Link Distance (ft)	834	834
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1024

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	TR	L	T	T
Maximum Queue (ft)	408	180	122	115	113	255	725	753	718	150	515	478
Average Queue (ft)	194	118	54	40	41	241	544	512	385	119	329	311
95th Queue (ft)	372	220	104	92	86	303	879	823	703	182	467	446
Link Distance (ft)	646		664	664			789	789	789		834	834
Upstream Blk Time (%)							10	0	0			
Queuing Penalty (veh)							73	3	0			
Storage Bay Dist (ft)		180			150	255				150		
Storage Blk Time (%)	16	1		0	0	59	58			9	30	
Queuing Penalty (veh)	24	1		0	0	354	183			50	36	

Intersection: 1: Benns Church Boulevard & Cypress Run Drive

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	495	245
Average Queue (ft)	303	125
95th Queue (ft)	445	291
Link Distance (ft)	834	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		245
Storage Blk Time (%)	12	1
Queuing Penalty (veh)	20	3

Intersection: 2: Benns Church Boulevard & Tractor Supply Entrance

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	T	T	T	T	T
Maximum Queue (ft)	90	130	124	86	83	8
Average Queue (ft)	36	50	41	11	3	0
95th Queue (ft)	74	233	213	106	84	6
Link Distance (ft)	458	472	472	472	789	789
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	NB
Directions Served	L	LT	R	L	LT	R	L	L	T	T	T	R
Maximum Queue (ft)	389	305	279	159	138	23	322	325	428	296	282	127
Average Queue (ft)	264	219	95	78	52	4	311	321	394	130	140	10
95th Queue (ft)	410	335	221	138	110	17	341	349	466	250	253	74
Link Distance (ft)	372			446	446				349	349	349	
Upstream Blk Time (%)	7								70	0	0	
Queuing Penalty (veh)	39								502	1	0	
Storage Bay Dist (ft)		305	305			150	325	325				200
Storage Blk Time (%)	10	2	0		0		5	57	46		2	0
Queuing Penalty (veh)	41	3	0		0		29	330	190		1	0

Intersection: 3: Benns Church Boulevard & Turner Drive

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (ft)	137	356	390	365	227
Average Queue (ft)	34	211	230	190	57
95th Queue (ft)	103	323	347	315	156
Link Distance (ft)		768	768	768	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	140				280
Storage Blk Time (%)	0	11		1	0
Queuing Penalty (veh)	0	4		2	0

Intersection: 4: Benns Church Boulevard & Red Oak Drive

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	T
Maximum Queue (ft)	422	200	1160	1153	32
Average Queue (ft)	204	53	491	485	1
95th Queue (ft)	482	176	1368	1366	33
Link Distance (ft)	950		1134	1134	553
Upstream Blk Time (%)			28	24	
Queuing Penalty (veh)			0	0	
Storage Bay Dist (ft)		200			
Storage Blk Time (%)		0	40		
Queuing Penalty (veh)		1	14		

Intersection: 5: Benns Church Boulevard & Site Driveway #1

Movement	EB	NB	NB	NB	SB
Directions Served	R	T	T	T	T
Maximum Queue (ft)	86	9	12	5	4
Average Queue (ft)	31	1	0	0	0
95th Queue (ft)	66	10	10	0	4
Link Distance (ft)	365	768	768	768	472
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Benns Church Boulevard & Site Driveway #2

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	T
Maximum Queue (ft)	75	964	950	935	34	45	44
Average Queue (ft)	27	789	474	241	1	2	0
95th Queue (ft)	56	1273	1111	851	35	38	7
Link Distance (ft)	312	933	933	933	349	349	349
Upstream Blk Time (%)		26	1	0	0	0	0
Queuing Penalty (veh)		192	4	2	0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	L	TR	L	T	T	T	R	L	T
Maximum Queue (ft)	161	137	224	253	174	250	280	299	286	248	299	447
Average Queue (ft)	76	57	102	158	72	107	251	208	182	50	138	223
95th Queue (ft)	143	107	215	233	137	279	313	320	296	156	271	401
Link Distance (ft)		726			479		250	250	250			933
Upstream Blk Time (%)						0	44	8	2	0		
Queuing Penalty (veh)						0	292	52	15	0		
Storage Bay Dist (ft)	300		300	300		300				300	300	
Storage Blk Time (%)				0		0	44		2	0	0	2
Queuing Penalty (veh)				0		2	47		5	1	1	4

Intersection: 7: Benns Church Boulevard & Site Driveway #3

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	497	423	132
Average Queue (ft)	257	180	26
95th Queue (ft)	451	365	81
Link Distance (ft)	933	933	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			300
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		0	0

Intersection: 8: Site Driveway #4 & Tractor Supply Entrance

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	23	58
Average Queue (ft)	1	30
95th Queue (ft)	12	48
Link Distance (ft)	458	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site Driveway #5 & Turner Drive

Movement	EB
Directions Served	LT
Maximum Queue (ft)	252
Average Queue (ft)	45
95th Queue (ft)	222
Link Distance (ft)	1402
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	2
Queuing Penalty (veh)	0

Intersection: 10: Tractor Supply Entrance & Site Driveway #6

Movement	SB
Directions Served	LR
Maximum Queue (ft)	33
Average Queue (ft)	12
95th Queue (ft)	36
Link Distance (ft)	938
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: Site Driveway #3 & Site Driveway #5

Movement	SB
Directions Served	LR
Maximum Queue (ft)	78
Average Queue (ft)	39
95th Queue (ft)	61
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Benns Church Boulevard & Site Driveway #12

Movement	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	R	T	T	T
Maximum Queue (ft)	236	585	585	575	100	83	120	54
Average Queue (ft)	97	357	314	169	4	3	6	2
95th Queue (ft)	251	756	715	517	52	48	71	40
Link Distance (ft)	233	553	553	553		250	250	250
Upstream Blk Time (%)	22	31	4	0		0	0	0
Queuing Penalty (veh)	0	233	32	2		0	0	0
Storage Bay Dist (ft)					200			
Storage Blk Time (%)				1	0			
Queuing Penalty (veh)				1	0			

Intersection: 28: Bend

Movement	NB	NB	NB
Directions Served	T	T	
Maximum Queue (ft)	603	718	76
Average Queue (ft)	34	68	3
95th Queue (ft)	294	429	77
Link Distance (ft)	834	834	834
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	1	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 2792

Appendix D
Queuing Results Summary Table

2022 Existing Queueing Summary

ID	Intersection	Maximum Queue per Movement (ft)											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
1	**Effective Storage Length**		**660**	**180**		**680**		**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run		70	65		35		75	140	160	25	195	55
2	**Effective Storage Length**		**-**	**695**		**-**			**1,320**			**800**	**-**
	Benns Church Boulevard at Tractor Supply		-	30		-		-	-	-	-	-	-
3	**Effective Storage Length**		**1,970**	**305**		**475**		**130**	**2,310**	**2,310**	**140**	**1,320**	**280**
	Benns Church Boulevard at Turner Drive		325	265		35		130	370	280	65	315	240
4	**Effective Storage Length**	**950**	**-**	**950**		**-**		**200**	**Cont.**	**-**		**-**	**140**
	Benns Church Boulevard at Red Oak Drive	50	-	50		**-**		35	-	**-**		-	-
PM Peak Hour													
1	**Effective Storage Length**		**660**	**180**		**680**		**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run		180	135		30		215	180	185	60	310	210
2	**Effective Storage Length**		**-**	**695**		**-**			**1,320**			**800**	**-**
	Benns Church Boulevard at Tractor Supply		-	35		-		-	-	-	-	-	-
3	**Effective Storage Length**		**1,970**	**305**		**475**		**130**	**2,310**	**2,310**	**140**	**1,320**	**280**
	Benns Church Boulevard at Turner Drive		215	110		40		130	335	300	105	260	130
4	**Effective Storage Length**	**950**	**-**	**950**		**-**		**200**	**Cont.**	**-**		**-**	**140**
	Benns Church Boulevard at Red Oak Drive	50	-	50		**-**		55	-	**-**		-	-

2025 No Build Queueing Summary

ID	Intersection	Level of Service per Movement by Approach (Delay in sec/veh)											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
1	**Effective Storage Length**		**660**	**180**		**680**		**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run		80	65		45		75	120	135	25	160	45
2	**Effective Storage Length**		**-**	**695**		**-**							**-**
	Benns Church Boulevard at Tractor Supply		-	30		-		-	-	-	-	-	-
3	**Effective Storage Length**		**1,970**	**305**		**475**		**130**	**2,310**	**2,310**	**140**	**1,320**	**280**
	Benns Church Boulevard at Turner Drive		325	265		35		130	295	215	65	280	205
4	**Effective Storage Length**	**950**	**-**	**950**		**-**		**200**	**Cont.**	**-**		**-**	**140**
	Benns Church Boulevard at Red Oak Drive	55	-	55		**-**		35	-	**-**		-	-
PM Peak Hour													
1	**Effective Storage Length**		**660**	**180**		**680**		**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run		165	120		25		215	190	195	50	300	195
2	**Effective Storage Length**		**-**	**695**		**-**							**-**
	Benns Church Boulevard at Tractor Supply		-	35		-		-	-	-	-	-	-
3	**Effective Storage Length**		**1,970**	**305**		**475**		**130**	**2,310**	**2,310**	**140**	**1,320**	**280**
	Benns Church Boulevard at Turner Drive		195	110		45		130	365	330	135	240	90
4	**Effective Storage Length**	**950**	**-**	**950**		**-**		**200**	**Cont.**	**-**		**-**	**140**
	Benns Church Boulevard at Red Oak Drive	60	-	60		**-**		55	-	**-**		-	5

2025 Build Queueing Summary

ID	Intersection	Maximum Queue per Movement (ft)											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
1	**Effective Storage Length**		**660**	**180**		**680**		**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run Drive		65	65		35		70	115	120	25	170	40
2	**Effective Storage Length**		**-**	**695**		**-**			**535**			**870**	**200**
	Benns Church Boulevard at Tractor Supply Entrance		-	35		-		-	-	-	-	-	-
3	**Effective Storage Length**	**385**	**305**	**305**		**475**		**130**	**260**	**260**	**140**	**780**	**280**
	Benns Church Boulevard at Turner Drive	315	280	150		35		130	280	250	70	435	280
4	**Effective Storage Length**	**950**	**-**	**950**		**-**		**200**	**Cont.**	**-**		**615**	**140**
	Benns Church Boulevard at Red Oak Drive	50	-	50		**-**		35	-	**-**		-	-
5	**Effective Storage Length**		**-**	**380**		**-**			**850**			**535**	
	Benns Church Boulevard at Site Driveway #1		-	65		**-**			-		-	-	-
6	**Effective Storage Length**		**-**	**325**		**-**			**1,039**			**340**	**-**
	Benns Church Boulevard at Site Driveway #2		-	70		-		-	180	-	-	-	-
7	**Effective Storage Length**		**-**	**750**		**-**		**200**	**315**			**1,110**	
	Benns Church Boulevard at Site Driveway #3		-	155		-		40					
8	**Effective Storage Length**							**735**		**735**			
	Tractor Supply Entrance at Red Site Driveway #4							35		35			
9	**Effective Storage Length**		**1,450**			**505**			**1,050**			**785**	
	Turner Drive at Site Driveway #5		45			105			25			25	
10	**Effective Storage Length**										**940**		**940**
	Tractor Supply Entrance at Site Driveway #6										35		35
11	**Effective Storage Length**										**1,050**		**1,050**
	Site Driveway #3 at Site Driveway #5										-		-
PM Peak Hour													
1	**Effective Storage Length**		**660**	**180**		**680**		**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run Drive		205	155		35		230	270	270	35	360	210
2	**Effective Storage Length**		**-**	**695**		**-**			**535**			**870**	**200**
	Benns Church Boulevard at Tractor Supply Entrance		-	35		-		-	-	-	-	-	-
3	**Effective Storage Length**	**385**	**305**	**305**		**475**		**130**	**260**	**260**	**140**	**780**	**280**
	Benns Church Boulevard at Turner Drive	230	210	140		50		130	290	295	135	385	280
4	**Effective Storage Length**	**950**	**-**	**950**		**-**		**200**	**Cont.**	**-**		**615**	**140**
	Benns Church Boulevard at Red Oak Drive	70	-	70		**-**		60	-	**-**		-	-
5	**Effective Storage Length**		**-**	**380**		**-**			**850**			**535**	
	Benns Church Boulevard at Site Driveway #1		-	70		**-**			-		-	-	-
6	**Effective Storage Length**		**-**	**325**		**-**			**1,039**			**340**	**-**
	Benns Church Boulevard at Site Driveway #2		-	65		-		-	270	-	-	-	-
7	**Effective Storage Length**		**-**	**750**		**-**		**200**	**315**			**1,110**	
	Benns Church Boulevard at Site Driveway #3		-	95		-		45					
8	**Effective Storage Length**							**735**		**735**			
	Tractor Supply Entrance at Red Site Driveway #4							35		35			
9	**Effective Storage Length**		**1,450**			**505**			**1,050**			**785**	
	Turner Drive at Site Driveway #5		40			70			25			25	
10	**Effective Storage Length**										**940**		**940**
	Tractor Supply Entrance at Site Driveway #6										-		-
11	**Effective Storage Length**										**1,050**		**1,050**
	Site Driveway #3 at Site Driveway #5										55		55

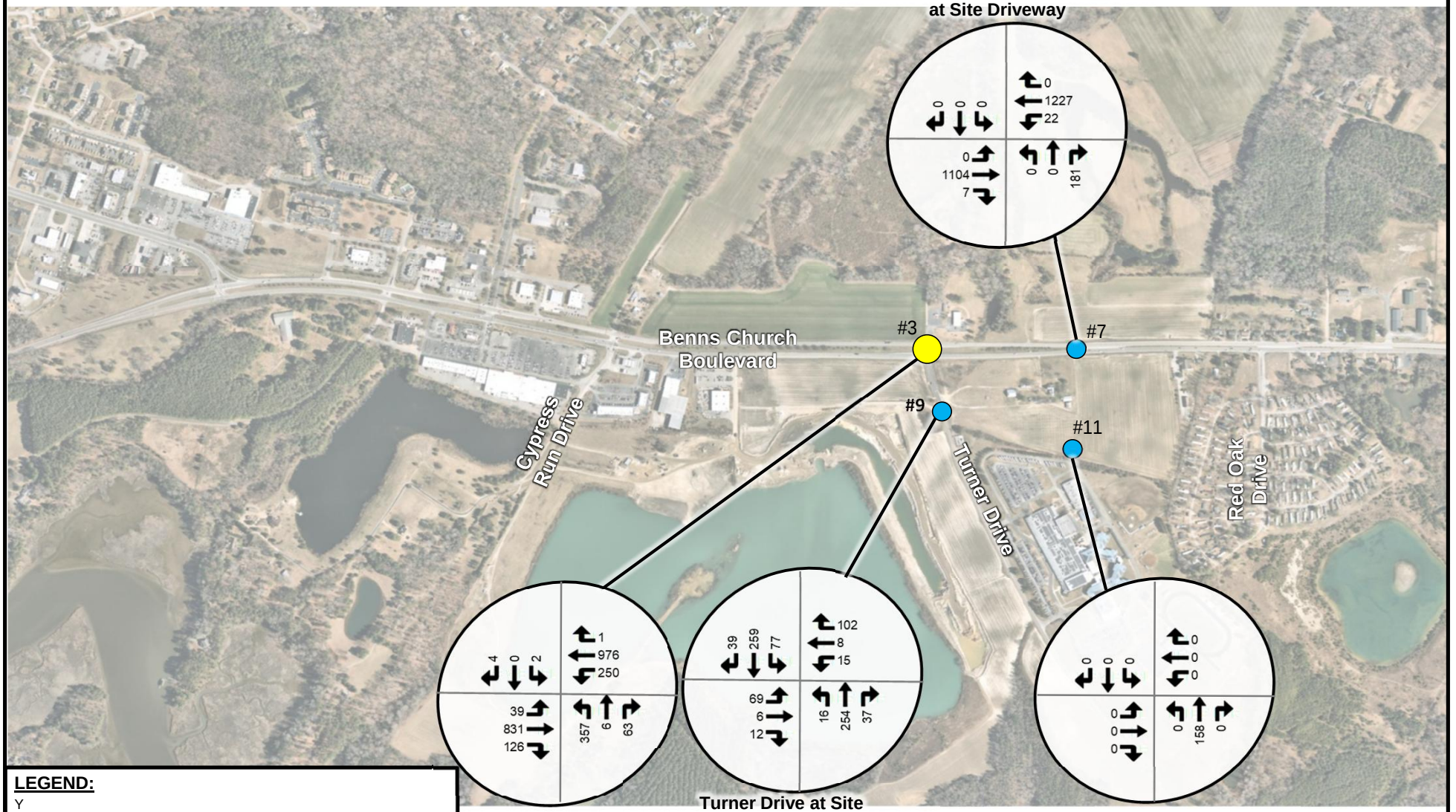
2029 Build Queueing Summary

ID	Intersection	Maximum Queue per Movement (ft)											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
1	**Effective Storage Length**		**660**	**180**		**680**		**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run Drive		195	165		250		205	370	365	150	510	245
2	**Effective Storage Length**		**-**	**695**		**-**			**535**			**870**	**200**
	Benns Church Boulevard at Tractor Supply Entrance		-	100		-		-	-	-	-	-	-
3	**Effective Storage Length**	**385**	**305**	**305**		**475**		**325**	**260**	**260**	**140**	**780**	**280**
	Benns Church Boulevard at Turner Drive	400	305	290		70		370	255	150	60	645	280
4	**Effective Storage Length**	**950**	**-**	**950**		**-**		**200**	**Cont.**	**-**		**615**	**140**
	Benns Church Boulevard at Red Oak Drive	100	-	100		**-**		40	-	**-**		-	-
5	**Effective Storage Length**		**-**	**380**		**-**			**850**			**535**	
	Benns Church Boulevard at Site Driveway #1		-	105		**-**			-		-	35	-
6	**Effective Storage Length**		**-**	**325**		**-**			**1,039**			**340**	**-**
	Benns Church Boulevard at Site Driveway #2		-	110		-		-	375	-	-	-	-
7	**Effective Storage Length**	**300**	**840**		**300**	**550**		**300**	**315**	**300**	**300**	**1,025**	**300**
	Benns Church Boulevard at Site Driveway #3	145	240		275	140		225	265	135	300	540	300
8	**Effective Storage Length**							**735**		**735**			
	Tractor Supply Entrance at Site Driveway #4							65		65			
9	**Effective Storage Length**		**1,450**			**505**			**1,050**			**785**	
	Turner Drive at Site Driveway #5		235			125			40			25	
10	**Effective Storage Length**										**940**		**940**
	Tractor Supply Entrance at Site Driveway #6										40		40
11	**Effective Storage Length**										**1,050**		**1,050**
	Site Driveway #3 at Site Driveway #5										70		70
12	**Effective Storage Length**					**310**			**620**	**200**	**-**	**315**	**-**
						60			-	-	-	-	-
PM Peak Hour													
1	**Effective Storage Length**		**660**	**180**		**680**		**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run Drive		300	180		310		255	755	765	150	850	245
2	**Effective Storage Length**		**-**	**695**		**-**			**535**			**870**	**200**
	Benns Church Boulevard at Tractor Supply Entrance		-	115		-		-	220.00	-	-	250	100
3	**Effective Storage Length**	**385**	**305**	**305**		**475**		**325**	**260**	**260**	**140**	**780**	**280**
	Benns Church Boulevard at Turner Drive	360	300	225		145		375	340	110	130	785	280
4	**Effective Storage Length**	**950**	**-**	**950**		**-**		**200**	**Cont.**	**-**		**615**	**140**
	Benns Church Boulevard at Red Oak Drive	385	-	385		**-**		170	1,040	**-**		-	-
5	**Effective Storage Length**		**-**	**380**		**-**			**850**			**535**	
	Benns Church Boulevard at Site Driveway #1		-	240		**-**			55		-	355	-
6	**Effective Storage Length**		**-**	**325**		**-**			**1,039**			**340**	**-**
	Benns Church Boulevard at Site Driveway #2		-	95		-		-	980	-	-	-	-
7	**Effective Storage Length**	**300**	**840**		**300**	**550**		**300**	**315**	**300**	**300**	**1,025**	**300**
	Benns Church Boulevard at Site Driveway #3	170	175		265	210		240	300	250	300	550	300
8	**Effective Storage Length**							**735**		**735**			
	Tractor Supply Entrance at Red Site Driveway #4							60		60			
9	**Effective Storage Length**		**1,450**			**505**			**1,050**			**785**	
	Turner Drive at Site Driveway #5		70			110			25			25	
10	**Effective Storage Length**										**940**		**940**
	Tractor Supply Entrance at Site Driveway #6										40		40
11	**Effective Storage Length**										**1,050**		**1,050**
	Site Driveway #3 at Site Driveway #5										75		75
12	**Effective Storage Length**					**310**			**620**	**200**	**-**	**315**	**-**
						250			595	200	-	-	-

2045 Build Queueing Summary

ID	Intersection	Maximum Queue per Movement (ft)											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
1	**Effective Storage Length**		**660**	**180**	**680**	**680**	**150**	**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run Drive		205	170	200	190	125	220	355	300	150	385	210
2	**Effective Storage Length**	**-**		**695**	**-**				**535**			**870**	**200**
	Benns Church Boulevard at Tractor Supply Entrance	-		95	-			-	-	-	-	-	-
3	**Effective Storage Length**	**385**	**305**	**305**	**450**	**450**	**150**	**325**	**260**	**260**	**140**	**780**	**280**
	Benns Church Boulevard at Turner Drive	395	305	300	60	50	25	325	430	140	70	455	280
4	**Effective Storage Length**	**950**	**-**	**950**	**-**			**200**	**Cont.**	**-**		**615**	**140**
	Benns Church Boulevard at Red Oak Drive	225	-	225	**-**			80	205	**-**		65	-
5	**Effective Storage Length**	**-**		**380**	**-**				**850**			**535**	
	Benns Church Boulevard at Site Driveway #1	-		100	**-**				-		-	35	-
6	**Effective Storage Length**	**-**		**325**	**-**				**1,039**			**340**	**-**
	Benns Church Boulevard at Site Driveway #2	-		85	-			-	820	-	-	80	-
7	**Effective Storage Length**	**300**	**840**		**300**	**550**		**300**	**315**	**300**	**300**	**1,025**	**300**
	Benns Church Boulevard at Site Driveway #3	165	200		280	180		235	280	55	280	485	275
8	**Effective Storage Length**							**735**		**735**			
	Tractor Supply Entrance at Site Driveway #4							60		60			
9	**Effective Storage Length**		**1,450**			**505**			**1,050**			**785**	
	Turner Drive at Site Driveway #5		435			175			50			25	
10	**Effective Storage Length**										**940**		**940**
	Tractor Supply Entrance at Site Driveway #6										50		50
11	**Effective Storage Length**										**1,050**		**1,050**
	Site Driveway #3 at Site Driveway #5										85		85
12	**Effective Storage Length**						**310**		**620**	**200**	**-**	**315**	**-**
							75		300	-	-	70	-
PM Peak Hour													
1	**Effective Storage Length**		**660**	**180**	**680**	**680**	**150**	**255**	**800**	**800**	**150**	**1,705**	**245**
	Benns Church Boulevard at Cypress Run Drive		410	180	125	115	115	255	755	720	150	515	245
2	**Effective Storage Length**	**-**		**695**	**-**				**535**			**870**	**200**
	Benns Church Boulevard at Tractor Supply Entrance	-		90	-			-	130.00	-	-	85	-
3	**Effective Storage Length**	**385**	**305**	**305**	**450**	**450**	**150**	**325**	**260**	**260**	**140**	**780**	**280**
	Benns Church Boulevard at Turner Drive	390	305	280	160	140	25	325	430	130	140	390	230
4	**Effective Storage Length**	**950**	**-**	**950**	**-**			**200**	**Cont.**	**-**		**615**	**140**
	Benns Church Boulevard at Red Oak Drive	425	-	425	**-**			200	1,160	**-**		35	-
5	**Effective Storage Length**	**-**		**380**	**-**				**850**			**535**	
	Benns Church Boulevard at Site Driveway #1	-		90	**-**				-		-	-	-
6	**Effective Storage Length**	**-**		**325**	**-**				**1,039**			**340**	**-**
	Benns Church Boulevard at Site Driveway #2	-		75	-			-	965	-	-	45	-
7	**Effective Storage Length**	**300**	**840**		**300**	**550**		**300**	**315**	**300**	**300**	**1,025**	**300**
	Benns Church Boulevard at Site Driveway #3	165	140		255	175		250	300	250	300	500	135
8	**Effective Storage Length**							**735**		**735**			
	Tractor Supply Entrance at Site Driveway #4							60		60			
9	**Effective Storage Length**		**1,450**			**505**			**1,050**			**785**	
	Turner Drive at Site Driveway #5		90			155			30			30	
10	**Effective Storage Length**										**940**		**940**
	Tractor Supply Entrance at Site Driveway #6										35		35
11	**Effective Storage Length**										**1,050**		**1,050**
	Site Driveway #3 at Site Driveway #5										80		80
12	**Effective Storage Length**						**310**		**620**	**200**	**-**	**315**	**-**
							240		585	100	-	120	-

Appendix E
Supplemental 2025 PM Build Analysis Outputs



LEGEND:

Y

Y = PM Peak Hour Turning Movement Volume (2:45 PM - 3:45 PM)

Image Provided by Nearmap

Kimley»Horn

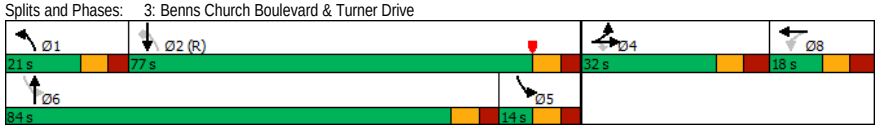
2025 PM Build Supplemental Analysis Volumes

Appendix E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	357	6	63	2	0	4	250	976	1	39	831	126
Future Volume (vph)	357	6	63	2	0	4	250	976	1	39	831	126
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.910							0.850
Flt Protected	0.950	0.954			0.984		0.950			0.950		
Satd. Flow (prot)	1649	1658	1568	0	1701	0	1719	3539	0	1805	3471	1599
Flt Permitted	0.950	0.954					0.237			0.203		
Satd. Flow (perm)	1649	1658	1568	0	1729	0	429	3539	0	386	3471	1599
Satd. Flow (RTOR)			228		228							172
Adj. Flow (vph)	392	7	69	2	0	4	275	1073	1	43	913	138
Lane Group Flow (vph)	200	199	69	0	6	0	275	1074	0	43	913	138
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2			6		2
Total Split (s)	32.0	32.0	32.0	18.0	18.0		21.0	84.0		14.0	77.0	77.0
Total Lost Time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Act Effct Green (s)	22.0	22.0	22.0		7.0		97.2	94.3		98.9	82.5	82.5
Actuated g/C Ratio	0.15	0.15	0.15		0.05		0.66	0.64		0.67	0.56	0.56
v/c Ratio	0.82	0.81	0.16		0.02		0.67	0.48		0.14	0.47	0.14
Control Delay	86.3	85.3	0.8		0.2		18.3	16.4		10.3	21.9	1.6
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	86.3	85.3	0.8		0.2		18.3	16.4		10.3	21.9	1.6
LOS	F	F	A		A		B	B		B	C	A
Approach Delay		73.3			0.2			16.8			18.9	
Approach LOS		E			A			B			B	

Intersection Summary			
Cycle Length: 148			
Actuated Cycle Length: 148			
Offset: 38 (26%), Referenced to phase 2:NBSB, Start of Yellow			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 26.6		Intersection LOS: C	
Intersection Capacity Utilization 74.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Benns Church Boulevard & Turner Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	357	6	63	2	0	4	250	976	1	39	831	126
Future Volume (vph)	357	6	63	2	0	4	250	976	1	39	831	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1649	1658	1568		1701		1719	3539		1805	3471	1599
Flt Permitted	0.95	0.95	1.00		1.00		0.24	1.00		0.20	1.00	1.00
Satd. Flow (perm)	1649	1658	1568		1729		429	3539		385	3471	1599
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	392	7	69	2	0	4	275	1073	1	43	913	138
RTOR Reduction (vph)	0	0	59	0	6	0	0	0	0	0	0	68
Lane Group Flow (vph)	200	199	10	0	0	0	275	1074	0	43	913	70
Heavy Vehicles (%)	4%	0%	3%	0%	0%	0%	5%	2%	0%	0%	4%	1%
Turn Type	Split	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	4	4			8		1	6		5	2	
Permitted Phases			4	8			2			6		2
Actuated Green, G (s)	22.0	22.0	22.0		1.4		90.0	85.4		90.0	75.3	75.3
Effective Green, g (s)	22.0	22.0	22.0		1.4		90.0	85.4		90.0	75.3	75.3
Actuated g/C Ratio	0.15	0.15	0.15		0.01		0.61	0.58		0.61	0.51	0.51
Clearance Time (s)	9.0	9.0	9.0		9.0		8.3	8.3		8.3	8.3	8.3
Vehicle Extension (s)	5.0	5.0	5.0		3.0		4.0	6.0		2.0	6.0	6.0
Lane Grp Cap (vph)	245	246	233		16		389	2042		278	1765	813
v/s Ratio Prot	c0.12	0.12					0.07	c0.30		0.00	0.26	
v/s Ratio Perm			0.01		c0.00		c0.36			0.09		0.04
v/c Ratio	0.82	0.81	0.04		0.00		0.71	0.53		0.15	0.52	0.09
Uniform Delay, d1	61.0	61.0	54.0		72.6		15.7	19.0		22.7	24.2	18.7
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.7	19.7	0.2		0.1		6.2	1.0		0.1	1.1	0.2
Delay (s)	81.7	80.6	54.2		72.7		21.9	20.0		22.8	25.3	18.9
Level of Service	F	F	D		E		C	B		C	C	B
Approach Delay (s)		77.2			72.7			20.4			24.4	
Approach LOS		E			E			C			C	

Intersection Summary				
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	34.6	
Intersection Capacity Utilization	74.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	181	0	0	0	22	1227	0	0	1104	7
Future Volume (vph)	0	0	181	0	0	0	22	1227	0	0	1104	7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt			0.865								0.999	
Flt Protected								0.999				
Satd. Flow (prot)	0	0	1611	0	0	1863	0	3536	0	0	3536	0
Flt Permitted								0.999				
Satd. Flow (perm)	0	0	1611	0	0	1863	0	3536	0	0	3536	0
Adj. Flow (vph)	0	0	191	0	0	0	23	1292	0	0	1162	7
Lane Group Flow (vph)	0	0	191	0	0	0	0	1315	0	0	1169	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 52.9%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	181	0	0	0	22	1227	0	0	1104	7
Future Volume (Veh/h)	0	0	181	0	0	0	22	1227	0	0	1104	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	191	0	0	0	23	1292	0	0	1162	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1858	2504	584	2110	2507	646	1169			1292		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1858	2504	584	2110	2507	646	1169			1292		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	58	100	100	100	96			100		
cM capacity (veh/h)	44	27	455	16	27	414	593			532		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	191	0	669	646	581	588
Volume Left	0	0	23	0	0	0
Volume Right	191	0	0	0	0	7
cSH	455	1700	593	1700	532	1700
Volume to Capacity	0.42	0.00	0.04	0.38	0.00	0.35
Queue Length 95th (ft)	51	0	3	0	0	0
Control Delay (s)	18.5	0.0	1.1	0.0	0.0	0.0
Lane LOS	C	A	A			
Approach Delay (s)	18.5	0.0	0.5		0.0	
Approach LOS	C	A				

Intersection Summary					
Average Delay		1.6			
Intersection Capacity Utilization	52.9%	ICU Level of Service		A	
Analysis Period (min)	15				

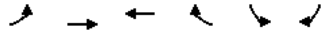
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	426	0	0	376	0	0	0	0	0	0	0
Future Volume (vph)	0	426	0	0	376	0	0	0	0	0	0	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	1863	1863	1863	1863	0	0	1863	1863	1863	1863	0
Flt Permitted												
Satd. Flow (perm)	0	1863	1863	1863	1863	0	0	1863	1863	1863	1863	0
Adj. Flow (vph)	0	463	0	0	409	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	463	0	0	409	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 25.8%			ICU Level of Service A		
Analysis Period (min) 15					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	426	0	0	376	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	426	0	0	376	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	463	0	0	409	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									8			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					504							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	409			463			872	872	463	872	872	409
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			463			811	811	463	811	811	302
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1147			1098			272	286	599	272	286	672

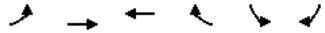
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	463	0	0	409	0	0	0
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1147	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.24	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS					A	A	A
Approach Delay (s)	0.0		0.0		0.0	0.0	
Approach LOS					A	A	

Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		25.8%	ICU Level of Service		A	
Analysis Period (min)		15				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	158	0	0	0	0
Future Volume (vph)	0	158	0	0	0	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Adj. Flow (vph)	0	172	0	0	0	0
Lane Group Flow (vph)	0	172	0	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	11.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	158	0	0	0	0
Future Volume (Veh/h)	0	158	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	172	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				172	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				172	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				818	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	172	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1623	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		11.6%	ICU Level of Service	A
Analysis Period (min)		15		

MOVEMENT SUMMARY

Site: 101 [Turner Drive at Site Driveway #9 2045 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Site Driveway #5														
3	L2	15	2.0	16	2.0	0.147	5.3	LOS A	0.6	16.1	0.49	0.39	0.49	34.7
8	T1	8	2.0	9	2.0	0.147	5.3	LOS A	0.6	16.1	0.49	0.39	0.49	34.6
18	R2	102	2.0	111	2.0	0.147	5.3	LOS A	0.6	16.1	0.49	0.39	0.49	33.6
Approach		125	2.0	136	2.0	0.147	5.3	LOS A	0.6	16.1	0.49	0.39	0.49	33.8
East: Turner Drive														
1	L2	77	2.0	84	2.0	0.315	5.6	LOS A	1.8	46.4	0.19	0.07	0.19	24.6
6	T1	259	2.0	282	2.0	0.315	5.6	LOS A	1.8	46.4	0.19	0.07	0.19	24.1
16	R2	39	2.0	42	2.0	0.315	5.6	LOS A	1.8	46.4	0.19	0.07	0.19	23.6
Approach		375	2.0	408	2.0	0.315	5.6	LOS A	1.8	46.4	0.19	0.07	0.19	24.2
North: Site Driveway #5														
7	L2	69	2.0	75	2.0	0.104	4.9	LOS A	0.4	11.0	0.48	0.38	0.48	33.1
4	T1	6	2.0	7	2.0	0.104	4.9	LOS A	0.4	11.0	0.48	0.38	0.48	33.0
14	R2	12	2.0	13	2.0	0.104	4.9	LOS A	0.4	11.0	0.48	0.38	0.48	32.1
Approach		87	2.0	95	2.0	0.104	4.9	LOS A	0.4	11.0	0.48	0.38	0.48	32.9
West: Turner Drive														
5	L2	16	2.0	17	2.0	0.293	5.9	LOS A	1.6	39.4	0.39	0.25	0.39	24.8
2	T1	254	2.0	276	2.0	0.293	5.9	LOS A	1.6	39.4	0.39	0.25	0.39	24.3
12	R2	37	2.0	40	2.0	0.293	5.9	LOS A	1.6	39.4	0.39	0.25	0.39	23.7
Approach		307	2.0	334	2.0	0.293	5.9	LOS A	1.6	39.4	0.39	0.25	0.39	24.2
All Vehicles		894	2.0	972	2.0	0.315	5.6	LOS A	1.8	46.4	0.33	0.21	0.33	25.9

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.